

International Studies in Entrepreneurship

Malin Brännback
Alan L. Carsrud *Editors*

Revisiting the Entrepreneurial Mind

Inside the Black Box: An Expanded
Edition

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Both this book and the original volume are dedicated to the hard work and intellectual curiosity of our research colleagues in entrepreneurship. We also acknowledge the entrepreneurs in all corners of the Earth we have known that pushed us to study this as a field of knowledge. It is the entrepreneur that we must always keep in mind. It is this individual and their start-up teams that remain critical to the creation of new ventures.

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We clearly want to thank research colleagues, graduate students, friends, and fellow authors in this volume. The intellectual stimulus they provided to us and to the authors in this volume and the original book continues to have a long-term impact on the study of the entrepreneur. Finally, we want to thank our families for allowing us the time, over a nearly 2-year period for the original volume and an additional year for this update. Their tolerance for our frequent trips abroad and early morning phone calls cannot be overemphasized.

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Erratum to: E1

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Chapter 1

Revisiting the Entrepreneurial Mind: Inside the Black Box

Malin Brännback and Alan Carsrud

1.1 Introduction

It is not often that the editors and authors of a research volume in entrepreneurship have the opportunity to revisit their work and discuss the “state of the art” since their respective chapters were written. However, we have been given that opportunity with this “revisiting” volume. A number of the authors of our first *Mind* book, along with some new colleagues, take a second look at the research, theories, and approaches now being employed in the study of the entrepreneurial cognitions and motivations. This volume *Revisiting the Entrepreneurial Mind: Inside the Black Box* builds upon (and includes) many of the chapters originally found in our *Understanding the Entrepreneurial Mind: Opening the Black Box* (Carsrud and Brännback 2009).

As in the original work, we bring together commentaries by leading researchers in entrepreneurship on various aspects of cognitive and motivational psychology as it impacts entrepreneurial behavior. These papers provide highly targeted reviews of the critical work and relevant literatures since 2008. These “revisiting” chapters also allow authors to discuss new research paradigms and propose future research directions they see given their vantage point seven years after the original volume was completed.

To help you understand the current volume, we provide below an annotated version of the original “Introduction” to *Understanding the Entrepreneurial Mind: Opening the Black Box* (Carsrud and Brännback 2009). What we want you to understand is how the content of the original book was developed, who helped to fund the original work, and how the clusters of chapters were determined and what of the original chapters have been included in this *revisited* volume. Those original chapters not included in

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Table 1.1 The clustering of the original *Understanding the Entrepreneurial Mind* book

<i>Understanding the Entrepreneurial Mind: Opening the Black Box</i>				
Entrepreneurial perceptions and intentions	Cognitive maps and entrepreneurial scripts	Motivations, emotions, and entrepreneurial passion	Attribution, self-efficacy, and locus of control	Beyond cognition: from thinking and opportunity alertness and opportunity identification to behaving

this update were because the research in that particular area may have been subsumed by another, the authors have lost interest in the topic, some have retired, or simply little significant progress has been made in that particular area in the last seven years. We are most pleased that much of the conceptual areas have in fact seen work and research progress. We want to thank those original authors, and new authors, who stepped up to the challenge of revisiting chapters in order to advance research in the field.

Our initial intention was to maintain the same clustering of topics in this *revisited* volume as in the original book. We asked the author(s) to start from the original chapters and in a separate (and often shorter) chapter that follows the original to expand on the original work. This means that the reader can first read the original chapter and then continue with the update. We took this approach so a researcher new to the area can read what was originally written on a topic. Then, they can read what chapter authors now see as relevant and where research on that topic is going and still should be done. We have specifically asked authors not to repeat information found in the original chapter but to move beyond that literature review wherever possible. In Table 1.1 you find the original structure of the 2009 volume.

Once we received the new contributions, we discovered that we also had to update our original clustering of chapters as the intervening years have brought some changes to the research landscape. The current volume has four clusters instead of the original five. There are in particular two significant observations that we want to point out. In the first cluster, we have changed the order of some chapters because the authors Douglas (2016) and Krueger (2016) in their separate revisions pointed at one important issue that still mandates further research into entrepreneurial intentions, the link between intentions and action. This seems to be one of the major research topics with which the field continues to wrestle. In this volume Krueger (2016) points at this dilemma arguing that research on entrepreneurial intentions is indeed massive; in fact it has literally exploded if measured by volume. However, Krueger is rightfully concerned and poses some provocative questions with respect to our research questions and our research methodologies.

In the original volume, Elfving et al. (2009) argued for the need for contextualizing entrepreneurial intentions—the need for paying careful attention to *context* that entrepreneurial intentions were dependent on the context of the intending entrepreneur. This topic is indeed still relevant and in fact has become even more relevant in recent years (Welter 2011). Therefore, we have included a *new* chapter

Table 1.2 The clustering of this volume *Revisiting the Entrepreneurial Mind*

<i>Revisiting the Entrepreneurial Mind: Inside the Black Box</i>			
From intentions to action	Contexts, cognition, and entrepreneurial expertise	Motivations, emotions, attributions, and self-efficacy	Entrepreneurial alertness, opportunity identification, and behavior

on context and entrepreneurial cognition. Cognitive maps, which were proposed as an efficient means of inquiring into how entrepreneurs think and structure their entrepreneurial realities (Brännback and Carsrud 2009), have not gained popularity, but instead the discussion has morphed into the area of contextualizing realities. The need to map cognitive complexities has by no means disappeared. Hence, the first two clusters are altered with respect to their structures as shown in Table 1.2.

1.2 A Historical Overview

As we noted in Carsrud and Brännback (2009), the study of human mind is traceable to the early Greek philosophers, in particular Plato and Aristotle, who dealt with issues of perception and motivation. The modern study of the human mind usually is considered to be energized by Sigmund Freud (1900) and the psychoanalytic movement. However, it was Wilhelm Wundt in 1879 who began the scientific study of human perception and motivation (Allport 1955). While Wundt was very much an experimental researcher, it was Freud who popularized the exploration of factors that propelled humans to engage in a variety of behaviors.

While Freud's focus was on repressed sexuality, our focus in this volume and the earlier one (Carsrud and Brännback 2009) owes much more to the German physiologist Wundt's approach in the study of cognitions, perceptions, and behavior. As with Carsrud and Brännback (2009), we are looking once again at the expression of the cognitions, motivations, intentions, perceptions, emotions, and behaviors associated with entrepreneurs trying to expand on the work of why entrepreneurs think or behave differently from other people (Baron 1998, 2004).

As we noted (Carsrud and Brännback 2009) in the 1990s, entrepreneurship research largely abandoned the study of the entrepreneur, unable to demonstrate some unique entrepreneurial personality, trait, or characteristic (Brockhaus and Horwitz 1986). As noted in Carsrud and Brännback (2011), this search for a unique trait to explain why entrepreneurs are the way they are was naïve and simplistic. There frankly is not a "holy grail" to explain entrepreneurs, despite the desires of researchers and politicians. Contextual factors will negate any single factor being uniform across populations as some of the chapters in this volume will attest.

That said, the researchers in this volume never gave up the belief that a better understanding of the mind of the entrepreneur would give us a better understanding of the processes that lead to the creation of new ventures. The mere fact we are doing an updated volume says that our belief has been shared by others.

Clearly this book and the earlier 2009 volume enhanced the overviews of the cognitive characteristics of the entrepreneur found in the analyses of data from the Panel Study of Entrepreneurial Dynamics (PSED) work of Gartner et al. (2004). Relevant to both this volume and the original book are the discussions on cognitions (Kelly 2004a, b), career choices (Carter et al. 2004), goals (Gatewood 2004), motivation (Johnson et al. 2004a, b; Liao and Welsch 2004), decision style and problem-solving (Johnson et al. 2004a, b; Ford and Matthews 2004), and locus of control and attributions (Kelly 2004a, b). Once again, the focus here is on the theoretical foundation for various concepts and conceptual constructs that should be the basis of continuing progress in research.

This book brings together not just commentaries on the cognitive psychology of the entrepreneur, but more importantly new approaches to the key research areas that we believe describe the critical thought processes of the entrepreneur. We do this rather than focusing on the “entrepreneurial personality.” As with our original volume, we are attempting in this follow-up volume to suggest directions for future research, teaching focus, policy making, and eventually the practice of entrepreneurship. We do this by challenging serious scholars to consider various elements of the “entrepreneurial mind” in their research. By doing so we believe we can foster those cognitive elements that the entrepreneur uses, consciously and unconsciously, in their daily activities, while acknowledging the impact of context in the expression of cognitions.

We are fortunate that we have not yet found that entrepreneurs are “born that way.” Among other things it would mean that “entrepreneurship cannot be taught.” Despite some attempts to find a genetic basis for entrepreneurial behavior (Nicolaou et al. 2008), such approaches largely ignore the role of context in impacting thought and behavior. Clearly, we still have a lot of work to do when it comes to understanding how entrepreneurs think and what drives their action.

It is wonderful to report that research on entrepreneurial cognitions for the past two decades remains active. For example, we know a lot more about the role of how experience, training, and education can shape motivations, cognitions, and behaviors to help in the creation of entrepreneurs (Carsrud and Brännback 2009, 2011). We have also learned that the cognitive processes of the entrepreneur are far more complex than assumed in the 1980s. Thus, while we now have a better understanding of the mind of the entrepreneur and the various processes that lead to the creation of new ventures, much clearly remains to be learned.

Our research colleagues largely have move beyond the relative simplistic search for “risk-taking traits” in entrepreneurs or the “entrepreneurial personality.” Early researchers should have paid attention to Schumpeter’s proposition that entrepreneurs do not take risks, but bankers do (1934, p. 137). To him, and to many entrepreneurs, risk is in no way part of the entrepreneurial function. Clearly, post the Great Recession, the study of risk taking should now be focused on bankers in financial markets. Too often we forget that personality characteristics are uniformities within the behavior of the individual (Deutsch and Krauss 1965). Frankly, many researchers naïvely expect communality in personality types across individual entrepreneurs or bankers often confusing personalities with role-related cognitions and behaviors.

1.3 The Search for Research Paradigms

Thirty years ago, entrepreneurship was a pre-paradigmatic discipline (Carsrud et al. 1986; Vesper 1987; Carsrud and Johnson 1989; Stevenson and Jarillo 1990) in need of adopting theories from more established disciplines like psychology and sociology, e.g., attribution theory (Shaver and Scott 1991). As noted earlier, Brockhaus and Horwitz (1986) rightly argued that hunting for unique personality characteristics for entrepreneurs had been disappointing. Gartner (1988) therefore proposed shifting focus to the firm as the unit of analysis and the external factors impacting their creation.

Unfortunately, the field nearly “threw the baby out with the bathwater”; psychology, and especially individual motivations, had little to add to the study of entrepreneurs. It was to take almost 10 years before *entrepreneurial cognition* was to reenter the entrepreneurial arena (an extensive review in Mitchell et al. 2000, 2007; Busenitz and Barney 1997; Gaglio and Katz 2001; Sarasvathy 2001). The renewed interest in intentions (Krueger and Carsrud 1993; Krueger et al. 2000), attributions (Shaver et al. 2001), and cognitive elements (Mitchell et al. 2002) propelled a long overdue renaissance for studying the entrepreneurial mind. The reader will find in various chapter clusters in-depth discussion on various aspects of these topics.

Shane (2003) has called for a unifying theory of the field of entrepreneurship. Yet the field remains largely in a pre-paradigmatic phase and, like most social science-based disciplines, lacks a unifying theory. We are reminded by Kenworthy and McMullen (2014) to be careful in borrowing from other disciplines and the importance of generating practical knowledge. Searching for a single theory most likely is a fruitless pursuit. First, how would entrepreneurship really benefit from such a unifying theory? Even physics cannot agree on a unified theory. To us, diversity is richness, which in turn is the basis for creativity. The opposite would be a form of anorexia, incapable of facilitating growth and the creation of new.

Entrepreneurship research is still inhibited by the indiscriminate transfer or, worse yet, the wholesale ignoring of well-tested theories especially from psychology and other behavioral sciences that could advance the study of the entrepreneurial mind and subsequent behaviors (Kenworthy and McMullen 2014). There are clearly alternative perspectives than the firm-focused—external and internal—strategy-based strategic positioning (Porter 1980) or resource-based view of the firm (Penrose 1959) relevant for entrepreneurship. While these theories are indeed useful, they are on the firm level and tell us nothing about the thinking and motivations of the individual who creates the venture or takes decisions. Such externally oriented theoretical approaches, while valuable in their own right, still act as if the entrepreneur magically appears much like Athena sprung from the head of Zeus full born and adult. Entrepreneurs create companies and entrepreneurs are people. As we said in the introduction to Carsrud and Brännback (2009), entrepreneurial cognition is the heart of entrepreneurship.

Clearly, the initial search for personality differences between entrepreneurs and non-entrepreneurs was a simplistic, if not naïve, quest. One should have expected

successful entrepreneurs to have traits similar to any other successful professional or leader in any career stream (Carsrud et al. 1989; Begley and Boyd 1987; Carter et al. 2004). The right approach, we suggest, is for appropriately adopting models and theories from psychology and other behavioral science-based disciplines, like marketing, that can be used to better understand entrepreneurial cognitions, motivations, and subsequent behaviors. We also agree with Kenworthy and McMullen (2014) that these theories must generate practical knowledge useful to entrepreneurs, educators, and policy makers.

1.4 The Development Process of This Volume

The original volume for which this book is a follow-up was the result of a rather different editing process than what is usually customary. Three international book workshops were arranged: the first two in Jena, Germany, under the sponsorship of the Max Planck Institute for Economics. The first was held in December of 2007 and the second in May 2008. Authors also met at annual Babson College Entrepreneurship Research Conference in Chapel Hill, North Carolina, in June 2008. The last meeting was held in November 2008 in Miami, Florida, at Florida International University, under the sponsorship of the Kauffman Foundation. All of these meetings were aimed at coordinating the contributions to the original volume, but also set the stage for this current update to the original book. These discussions sought to tie concepts together in order to improve their operational definitions as well as how they should be researched. The aim was to avoid chapters being isolated silos and instead create integrated chapters. Given that authors are physically located all over the world, this was a bold goal. Despite the distance and thanks to these meetings, we met our goal for the original book on the entrepreneurial mind and set the stage for this updated volume.

1.5 Structure of the Book

This book is divided into a series of clusters, each of which contains several chapters with related topics. For example, original chapters on intentions with their updated chapters form one cluster. The same model holds for each of the other clusters of original chapters with their updates. Each cluster has a brief introduction to help tie chapters together and to related clusters. Author teams were encouraged to challenge those reading their original chapters with new models or approaches for looking at the topic at hand. The updates on original chapters discuss if these challenges have been met and what has been the direction of research since Carsrud and Brännback's book (2009) was published (see Tables 1.1 and 1.2).

1.6 Cluster I: From Entrepreneurial Intentions to Action

The initial cluster relates to entrepreneurial perceptions and intentions. The chapter and update on perceptions offer challenges to current views of how entrepreneurs perceive their world. The chapters on intentions and their updates include overviews of the various theories as well new models of intentions and the concept of informed intentions.

1.7 Cluster II: Contexts, Cognition, and Entrepreneurial Expertise

The second cluster of chapters and related updates underlines the importance of contexts, cognition, and entrepreneurial expertise. These represent various theoretical approaches on how entrepreneurs make sense of their world and their ventures. Readers will discover different streams of research use different terms to describe the same phenomena. By placing these together, we hope one can see the similarities in these concepts and the different ways to study them.

1.8 Cluster III: Motivations, Emotions, Attributions, and Self-Efficacy

Entrepreneurial cognitions require understanding motivational concepts and motivational states. This cluster of chapters and their updates ties to both intentions and behaviors. The initial motivation chapter and its update include various motivations that the entrepreneur possesses including work motivation, achievement motivation, and risk avoidance. The chapter and update on emotions bring classical research from psychology to bear on emotional states that impact entrepreneurial cognitions and behaviors. We continue to believe this research area will contribute to a deeper understanding the triggers of venture creation as emotions color the thinking and behaviors of entrepreneurs.

Attributions offer important insights in understanding how entrepreneurs interact with others or how venture capitalists view the entrepreneur. Likewise, self-efficacy ties to one of the key elements in the various models of entrepreneurial intentions, but by itself also ties to elements within various motivational models as found in another cluster. An additional discussion on risk can be found in the chapter on motivation. Self-efficacy has been widely researched, but the authors in this cluster provide new views of the concepts and methodological approaches to their study.

1.9 Cluster IV: Beyond Cognitions to Thinking and Behaving

This final cluster transitions from cognitions, including attitudes, to entrepreneurial behaviors. This cluster helps to link attitudes and cognitions to actual behaviors at the microlevel. In this final cluster, we have chapters and associated updates on

thinking and behaving. These represent linking various cognitions to their ultimate expression in actual behaviors. They bring a distinctly different view to the interface of cognitions and behaviors.

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Part I
From Intentions to Action

Chapter 2

Entrepreneurial Intentions Are Dead: Long Live Entrepreneurial Intentions

Norris F. Krueger

2.1 A Note to Educators and Practitioners

While this chapter is designed to spur more and better research into entrepreneurial intentions, the discussions here have significant value to practice and especially to the classroom. Throughout the chapter you will see direct comments about the practical and pedagogical implications of the issues under discussion. If we cannot serve our scholarly colleagues, our entrepreneurial colleagues, and our educator colleagues, this book misses a great opportunity and we all choose not to do so.

In classrooms and communities, we seek to develop more entrepreneurial students and trainees, we seek to develop better entrepreneurs. Part of that is raising their intentions to start a business; another part is making their intentions more realistic. To do both requires a deeper, richer understanding of the dynamic process by which entrepreneurial intentions evolve. As you will see, we have recently uncovered intriguing new knowledge about this that can be readily applied (and our scholarly friends will find most intriguing as well.)

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2.2 A Critical Overview of Intentions and Entrepreneurial Intentions

2.2.1 *Do Intentions Even Exist?*

Consider an experiment. The subject is wired up and the experimenter asks the subject to raise either hand. Interestingly, the experimenter can quickly discern which hand the subject will raise before subjects are aware themselves. Next, the experimenter induces the subject to raise either the left or right hand. However, the subject nonetheless perceives the choice as free will, even after being informed of the procedure. A neuroscientist can see our intentions before we perceive we have formulated them? We perceive intent toward a discrete behavior even where it is completely illusory? What does this mean for our models and measures of entrepreneurial intentions that we have carefully developed from proven theory and refined through rigorous empirical analysis? (Libet et al. 1983)

2.2.1.1 A Little History

The rush to describe this amazing phenomenon was like any nascent field of study: It tends to favor description over theory. However, if we are to answer the “Why?” question, we need theory. In remarkably short order, the field of entrepreneurship developed a broad, rich body of observational data that allowed entrepreneurship scholars to begin asking some very intriguing questions of value to scholar and practitioner alike. That success, coupled with the compelling subject matter, allowed the field to increase in breadth. However, the scarcity of well-developed theory was beginning to take its toll. And even where scholars had drawn on theory, they drew upon logical but deeply flawed domains such as personality psychology.

We then saw the entry of serious social psychology and, later, cognitive psychology and developmental psychology. Whatever the gestation processes of new ventures, the sequence of behaviors need not follow any optimal pattern, but the theories offered by social and cognitive (and developmental) psychology immediately provided testable models that seemed quite relevant to entrepreneurship.

For example, the field once upon a time referred to “budding” entrepreneurs, etc., and like much of the early work on the closely related topic of opportunity recognition, the work was atheoretic “dustball empiricism” that rarely moved past *ad hoc* descriptive studies that were all too often unreplicable. Given that a specific class of intentions models (the Fishbein–Ajzen models) were already used heavily in marketing with great practical effectiveness, it seemed painfully simple to test that in entrepreneurship. If you have well-developed theory and robust empirical models, why not test them (Krueger 1993; Krueger and Carsrud 1993)?

Since then, formal models of entrepreneurial intentions have been prolific and effective. Perhaps too effective? However, the construct of intentions appears to be deeply fundamental to human decision making and, as such, it should afford us

multiple fruitful opportunities to explore the connections between intent and a vast array of other theories and models that relate to decision making under risk and uncertainty. Better still, we have reason to believe that studying entrepreneurs yields findings that speak to a far wider array of human phenomena.

2.2.2 *Where Do Intentions “Come From”?*

We have long accepted the conventional wisdom that intentions are the consequence of a process that was reasonably well understood by social and cognitive psychology. That is, we typically model intentions of any kind as having a parsimonious, powerful set of predictors that yield significant relationships with remarkable robustness (e.g., Kim and Hunter 1993).

However, looking closely at entrepreneurial intentions has started to surface some inconsistent pieces of evidence that suggest we may need to re-conceptualize intentions at a more fundamental level. However, the reader will see that this only widens the door to a broad array of interesting and useful questions.

Intentions as Phlogiston? Phlogiston was a theorized element or compound that successfully explained one quirk of oxidation processes. When something oxidized (rusted, burned, etc.) it gained weight. Thus it was proposed that phlogiston was released by oxidization. Since oxidized materials gain weight, phlogiston must have negative weight, as odd as it may seem today.

We poke fun at what is now the obvious absurdity of phlogiston, especially given our current knowledge of oxygen. However, the phlogiston model did accurately explain and predict the consequences of oxidation. The numbers worked. When we learned of oxygen and its role in oxidization, we re-conceptualized the model. Instead of subtracting phlogiston, we add oxygen. Is there any lesson here for social sciences? For intentions? It certainly argues that we need to take a long look at how we conceptualize, model, and measure entrepreneurial intentions. The numbers may work, but is there a better model?

We conceive of intentions as the consequence of obvious antecedents. However, significant correlations or beta weights need not reflect a specific direction of causality. What if the “arrows” between intent and its “antecedents” are bi-directional? What if our intentions models are capturing a static snapshot of a significantly dynamic process? Studying entrepreneurial intentions has begun to raise these very questions (e.g., Brannback et al. 2006; Krueger et al. 2007). A review of the literature suggests that very few successful studies demonstrate that changes in the antecedents of intent actually led to changes in intent. There are zero studies showing that for entrepreneurial intentions. That might even suggest the possibility that even if the causation is reciprocal, what if intent influences its “antecedents” than vice versa?

The logical conclusion is that this review should return to first principles and carefully deconstruct (and re-construct) intentions. We will begin at the beginning and look at a brief history of our models of human intent and of entrepreneurial intentions in general. From there, we will look at how intentions fit into the bigger

entrepreneurial picture. We will bring in evidence from other domains that should help us with this quest, especially some striking evidence out of neuroscience. That will suggest a significant number of interesting new questions and of old questions in a new light (such as measuring intentions). From there, we will lay out an ambitious research agenda that explores our new insights into entrepreneurial intentionality and how intentions fit into the bigger picture.

2.2.3 *Where Have We Been?*

2.2.3.1 **Philosophical and Theoretical Grounding**

The notion of intentions and intentionality dates back to at least Socrates (who wondered why humans might intend evil or stupid behavior). There has always been some degree of belief that intentionality exists at the core of human agency. Husserl defined *intentionality* as “the fundamental property of consciousness.”

Intentional = Planned? Though later philosophers chipped away at that bold assertion, there has long been a sense that human behavior was either stimulus–response (behavior is essentially automatic in reaction to a specific signal or set of signals) or planned, where there are reasonably conscious cognitive processes at work. In fact, one recurring theme across most of the literature on intentions is that all planned behavior is intentional. (Even what appears to be stimulus–response can be the result of habituation or other conditioning. That is, it was planned behavior repeated often enough to become automatic.) Glibly equating planfulness and intent is most convenient for those seeking to model and measure intentions but, as we will see below, potentially misleading.¹

Channels and Conduits. Another recurring theme across theories and models of behavioral intentions is that intent is a resultant vector, the combination of all the various drivers each with differing direction and magnitude. We add up all the various antecedent forces and the result is intent (again, direction and magnitude).

Moreover, theory, especially empirical study, has tended to find a parsimonious list of critical antecedents for intentions as the reader will see below. All other influences are then channeled through the critical antecedents. For example, exogenous factors such as demographics and psychographics influence the intention to buy a product if and only if the exogenous factor affects one of more critical antecedents. Again, this enhances the parsimony of the model specified but hinges on the assumption that “antecedents” really are.

Static Models. Until recently, most theoretical and empirical models of intentions were static models of a clearly dynamic process. If intentions mirror other human cognitive process, then they are highly likely to be highly dynamic (and

¹For a nice review, see Dennett (1989) and Bratman (1987), who shows intent = choice + commitment to act.

those dynamics will tend to be complex.) For example, even if the static model has the correct variables, how will the specification change over time?

Robustness. Despite the above, empirical research finds the various incarnations of the model to be remarkably robust to imperfect sampling frames, flawed measures, and even misspecification of the model (Ajzen 1987). Meta-analyses (Kim and Hunter 1993) show that the model explains considerable variance in intent (and intent explains considerable variance in behavior).

There is potentially a significant downside to this robustness, however. For example, the good news may be that we can conceptualize and measure intentions very narrowly and specifically or conceptualize and measure very broadly. However, that is also the bad news in that our “intentions” research may focus on significantly different phenomena.

Here we choose to begin with a definition of intermediate specificity. “Entrepreneurial” intentions refer to the intent to start a business, to launch a new venture. It is important to select a level of specificity where heterogeneous samples will have adequately similar mental models of what the referent means (e.g., Ajzen 1987). “I intend to start a business” need not match exactly with “I intend to be an entrepreneur” but the bulk of the empirical research to date appears to use this and we will use that as a starting point.

2.2.3.2 Social Psychological Grounding

Building Testable Models. Historically, Martin Fishbein developed the first widely accepted model that simply argued we should be able to consistently identify critical human attitudes or beliefs that would predict future behavior. That critical belief he dubbed “attitude toward the act” and is typically operationalized much as valence is operationalized under expectancy theory. However, he soon noticed that the attitude–behavior link was fully mediated by intentions and that adding intentions dramatically increased explanatory and predictive power.

Fishbein and his protégé, then colleague Icek Ajzen further refined the attitude–intention–behavior model by adding a more contextual influence, that of social norms. That is, other people also have a powerful impact on our decisions. The resulting theory of reasoned action (TRA) includes a measure of “perceived social norms” that elicits the perceived supportiveness of important others weighted by our motivation to comply with their wishes (Ajzen and Fishbein 1980).

Icek Ajzen then took yet another step and identified a third critical antecedent that corresponded to instrumentality in the expectancy framework, perceived behavioral control. This third iteration was called the theory of planned behavior (TPB). PBC simply measures the perception that the target behavior is within the decision maker’s control. Typically, it is proxied with a measure of perceived competence at the task such as perceived self-efficacy. Ajzen (2002) later formalized this by arguing that PBC was a combination of locus of control (this is controllable) and self-efficacy (I am capable of doing this). Moreover, Chap. 19 argues that a deeper understanding of self-efficacy and its drivers should prove particularly useful in

Table 2.1 Evolution of intentions models

Model/variable	Desirability	Social norms	Feasibility	Other
Fishbein	Attitude	n/a	n/a	
TRA	Attitude	Social norms	n/a	
TPB	Attitude	Social norms	Perceived behavioral control	
Shapero-Krueger	Perceived desirability	(Included at left)	Perceived feasibility	Propensity to act

better understanding of both intention and action subsequently. In any event, TPB remains the single most used model of human intentions to this day (Ajzen 1987, 2002) (Table 2.1).

Measurement Issues and Opportunities. The social (and cognitive) psychological approach not only led to theory-driven testable models but it also affords the opportunity to use well-tested constructs and measures. However, it also raises the need for clarity and consistency in our definitions and operationalizations. For example, if we are constantly using variables that reflect our perceptions of situations and conditions (even self-reflection) it is imperative that we fully understand the key perceptual processes that influence entrepreneurial decision making. Chapter 4 will provide the reader with much greater depth than we could do here.

Another issue that scholars often fail to fully explicate is the notion of “control,” a term that sometimes we use rather glibly.

2.2.3.3 A Brief History of Entrepreneurial Intentionality

Meanwhile, scholars interested in entrepreneurial behavior were obviously quite concerned with the decision that lead up to an individual starting a new venture. “Budding entrepreneur” was commonly used, though an altogether fuzzy, ill-defined term.

One of the earliest scholars to use the term, albeit indirectly, was Shapero (1982) who developed what he called the model of the “entrepreneurial event” that is conceptually similar to Ajzen’s theory of planned behavior. Shapero equated intent to the identification of a credible, personally viable opportunity. For a perceived opportunity to be credible it had to be perceived by the decision maker as desirable (TPB’s attitude and social norm) and feasible (essentially self-efficacy). He also added another antecedent, propensity to act, which captured the potential for a credible opportunity to become intent and, thus, action.

Unlike Ajzen and Fishbein’s models, however, Shapero recognized that there were forces that moderated the intent–behavior linkage. Complex goal-focused behaviors may require some sort of precipitating factor, whether the perceived presence of a facilitating factor or the removal of a perceived critical barrier. Interestingly, the Ajzen framework assumes that the target behavior is within one’s volitional

control (no barriers or facilitators can intervene). Independent of Shapero, Bagozzi quickly noted this problematic facet of TPB.

Relevance to this Book: The reader would be well served to step back and review Chap. 21 on opportunity recognition. For more detailed discussion of moving intent into action, please review Chap. 23 on entrepreneurial behaviors.

Meanwhile, as social psychology rose to prominence in entrepreneurship research, so too did the notion of intentionality. In two landmark papers, Barbara Bird argued persuasively that intentionality seemed central to entrepreneurial behavior (1988, 1989). Indeed, entrepreneurs were clear exemplars of intentionality. At the same time, Jerome Katz and Bill Gartner (1988) identified intentionality as one of the four critical facets of an emerging new venture.

However, Shapero's model had gone untested empirically, nor had the theory of planned behavior, until Krueger (1993) tested the Shapero model empirically and found very strong confirmation of the model. In turn, this suggested it might be useful for entrepreneurship scholars to turn to this literature. Krueger and Carsrud (1993) made the case that entrepreneurship really needed to take a long look at the theory of planned behavior. Simultaneously, Krueger and Brazeal (1994; Krueger 2000) further explored the applicability of the Shapero model to multiple settings (i.e., both organizational and individual entrepreneurship) by adding insights from Ajzen's work to Shapero's original conception. Ultimately, Krueger et al. (2000) performed a competing hypotheses test that compared Shapero's model and TPB, finding that both models held. However, a *post hoc* examination suggested that adding social norms explicitly to the Shapero model increased explanatory power (see Fig. 2.1).

Other leading scholars were quick to adopt formal models of entrepreneurial intentions as well. Lars Kolvereid picked up the torch for the theory of planned behavior and quickly became the best-known user of TPB in entrepreneurship (e.g., 1996). Per Davidsson added the useful angle of exploring entrepreneurial intentions toward growth (Davidsson 1991). Today, intentions models are seemingly *de*

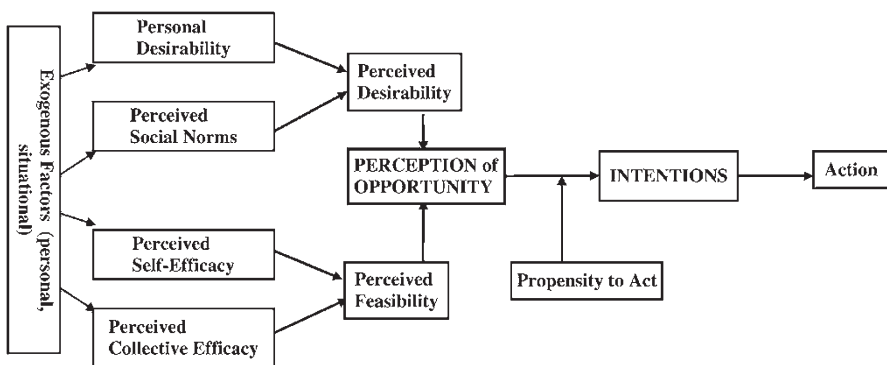


Fig. 2.1 Intentions model (adapted from Shapero 1982; Krueger and Brazeal 1994; Krueger 2000)

rigueur, with an easy variable to measure and considerable empirical robustness. However, this explosion of studies using a formal model such as the Shapero–Krueger model or TPB or simply using entrepreneurial intentions as a stand-alone variable has raised some intriguing questions.

The first question is obviously how we are defining “entrepreneurship.” Drawing from the careers literature (e.g., Lent et al. 1994 review) the target can be conceptualized and measured narrowly or broadly but it is critical for scholars to clear about their definitions. As noted earlier, here we have chosen the broader, more inclusive definition of starting a venture while retaining the notion that intent is a cognitive state causally prior to action. However, this raises the issue that terms can easily be perceived very differently by different stakeholders in the process (see Chap. 4). Consider also the evidence in Chap. 9 that entrepreneurs, managers, students, etc., have often strikingly different maps of the entrepreneurial process. Might that have important consequences for specifying the model? (Below we will mention how cognitive style seems to affect how to specify the model.)

Another issue is whether we are looking at intentions toward entrepreneurship independent of competing alternatives. Shapero’s (1982) notion of displacement and its role in the entrepreneurial event assumes a bounded rationality perspective where some displacing event (whether push or pull) would drive a reappraisal of career options. We already know from the broader study of human intentions (e.g., Dennett 1989) that we can hold competing, even conflicting intentions. How do we effectively model that?

Moreover, as entrepreneurs take each step forward, their intent may easily change. Sarasvathy’s (2001) work shows that entrepreneurial decision making is often far from linear. Under effectual thinking the pathway to the goal is likely to change as the entrepreneur works to find feasible and desirable paths toward a goal (which itself may well be a moving target). If entrepreneurs are effectuating we are likely to see intentions evolve in similarly nonlinear fashion. We certainly may wish to think about intentions as a stepwise process and consider modeling intentions toward each step.

Consider too the notion of bricolage (Baker and Nelson 2005). If entrepreneurs move forward with limited resources and must improvise with what they perceive as available, then what does that mean for how we model intent? For example, if the implementation of a step depends on choosing between a superior, but less controllable option and an inferior option that is seen as very controllable, it might be logical for the entrepreneur to select the seemingly inferior option.

While the model tends to hold overall, a glittering R-squared might be masking some deeper issues. Those issues already signal a need to take a long second look at how we model intentions (not just entrepreneurial intentions) and perhaps an equally long second look at the construct of intentions itself. As we peer more deeply into how we might use formal models of intentions on entrepreneurial phenomena, there are multiple opportunities to develop intellectually interesting and practically useful new insights.

2.2.4 *Where Are We Now?*

2.2.4.1 **Chinks in the Armor? The Rise of Disconfirming Evidence**

Recall that these models are predicated on the logic of a formative model, that is, there are antecedents that combine to form the target variable. One early study by Liska (1984) suggested that the “antecedents” may instead comprise a reflective model. More interestingly, Bagozzi and colleagues noticed that if we relax Ajzen’s assumption that behavior is fully volitional, that requires that we think in terms of “trying.” The seminal piece, “Trying to Consume” (Bagozzi and Warshaw 1990) forced several changes in modeling intentions effectively, especially if we are seeking to predict and not just explain.

Volition. Heckhausen (2007) frames it nicely that we too often conflate motivation (why we pursue an action) and volition (how we choose to pursue it), drawing on work as far back as Ach (1910) who demonstrated the central role of willpower as separate from motivation but mutually influencing.

The most important consideration here is that if the behavior is only partially volitional, as with goal attainment, it is inherently dynamic and must be modeled as such. A static snapshot could prove hopelessly inadequate. Second, human cognition is itself inherently complex, given the unavoidable embeddedness of even simple economic decisions in social and cultural contexts. Thus, intentions models must capture the important aspects of that. For example, we probably need to consider alternative behaviors/goals. Our intentions toward a specific career choice may not be terribly informative without looking at our intentions toward an alternative career. A third key aspect that we now need to examine is that human cognition tends to have both a rational component and an emotional component. Even the simplest “pure” economic decision has been shown to have an emotional dimension. For a classic example, witness how decision makers suddenly shift toward risk acceptance under Kahneman and Tversky’s (1979) loss frame.

2.2.4.2 **Reciprocal Causation?**

The most interesting hints about the existing models come from looking at specifying the intentions model in reverse (Krueger et al. 2007). Interestingly, early results show that the impact of intentions on the “antecedents” is stronger than the impact of antecedents on intent. Could it be that the correlations are so strong because this is a dynamic process where intent influences attitudes which influence intent, etc.? Note that the data appear to argue that the anchoring construct is intent (which in turn argues that at least our initial attitudes may be anchored on some initial intent). Note that Allport’s (1935) model treated what we call “intent” as but one of three critical antecedents of human action (cognitive, affective, and conative[intent]) that interacted in complex dynamic fashion.

Reciprocal causation goes a long way toward explaining anomalies such as the paucity of research that shows changes in attitudes leading to subsequent changes in intentions. What if we have that backward? Another anomaly this might address is that many intentions studies have found weak, even non-existent support for the influence of social norms on intent. Conceptually, social norms should be a potent predictor. However, what if social norms only influence initial intentions but attenuate as the intentions process evolves?

So, how might we begin to take advantage of these insights? (Note to the reader: Testing dynamic models can be dauntingly complex to implement properly, but we urge scholars to deploy dynamic models more often. Testing for reciprocal causation may be enlightening in many entrepreneurial phenomena.) Most important, if intentions at least partly drive subsequent attitudes, what drives initial intent? That is, what are the deeper beliefs that partially anchor intent?

2.2.4.3 Anchoring

If we propose that the dynamic process by which intentions evolve is anchored on some initial intent, we are still faced with the issue of understanding the origins of that initial intent. In a recent paper, Shaver (2007) called on scholars to closely examine the reasons that we attach to our intentions. That is, to what do intenders (and non-intenders?) attribute as the cause or source of their intentions? (Here I would suggest that readers interested in the key attributional processes of entrepreneurs read Chap. 17.)

Often these anchoring beliefs are very deeply held, often well outside of our mindful consideration. Kahneman and Tversky (e.g., 1979) long ago noted that human decision making often invoked an “anchor and adjust” heuristic where in novel situations we anchor our beliefs on initial information, then adjust for later information. Self-efficacy beliefs have proven to follow that dynamic (Bandura 2001; Chap. 19).

2.3 The Future of Entrepreneurial Intentions

2.3.1 *The Next Generation?*

2.3.1.1 The Theory of Trying

However, as Fig. 2.2 suggests, Bagozzi’s theory of trying might be conceptually closest to how human actually make decisions, but the model becomes rather unwieldy in comparison to the theory of planned behavior. If a scholar finds similar levels of statistical significance in both models, the far more parsimonious TPB is an easy choice. And, despite being a static snapshot of a complex, messy dynamic process, it still offers considerable explanatory power. Nonetheless, the cutting edge remains the model depicted below (e.g., Bagozzi et al. 2003; Dholakia and Bagozzi 2002; Brannback et al. 2007).

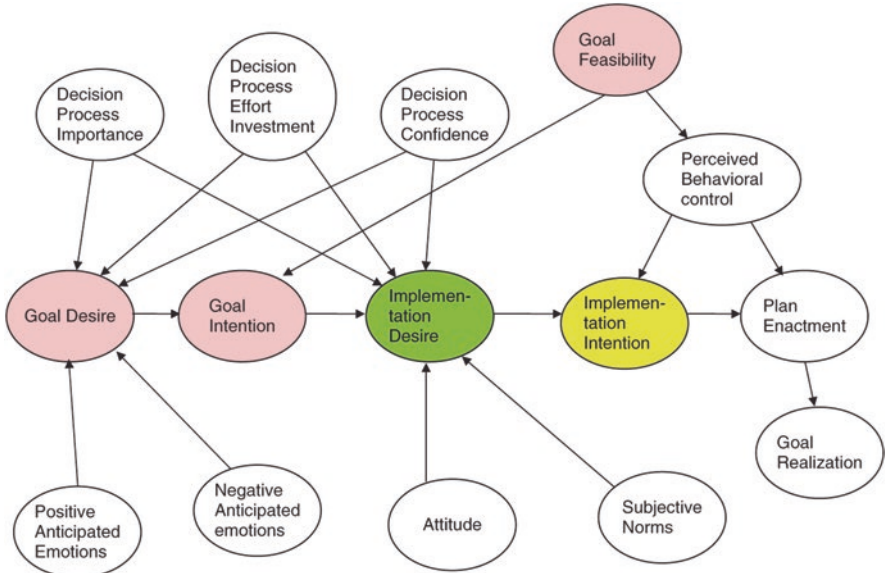


Fig. 2.2 Toward a theory of trying

2.3.1.2 Implementation Intentions

Gollwitzer and Brandstätter (1997) focused on a phenomenon that we also see in Bagozzi’s model, that of implementation intentions, following Ach’s (1910; Heckhausen 2007) work showing motivation and volition were usefully separable and allows us an immediate way to include a dynamic element. We may focus on a person’s intentions toward a goal, but once that goal is formulated there is no guarantee that the goal will be implemented. We formulate important goals all the time but really with no intent to actually implement. (Consider all the people who have an extremely strong goal intent toward smoking cessation but just a routinely fail to develop strong implementation intentions.)

The theory of trying and its variants should prove rich, fertile territory for entrepreneurship scholars (Brannback et al. 2007). At minimum, it would certainly be important for scholars to simply notice the distinction between goal intent and implementation intent: Is someone’s “entrepreneurial intention” a goal intent (they intend to begin the process) or an implementation intent (they intend to actually get the venture launched)?

2.3.2 The New Cutting Edges

For scholars interested in identifying even newer ground for intentions research, there are some intriguing directions to consider. We will focus on an overview of the fascinating (and useful) insights being generated by neuroscientists, and then discuss deep anchoring beliefs and implications for entrepreneurial learning and pedagogy.

2.3.2.1 Neuroentrepreneurship?

Consider the kind of experiment that opened this chapter. This work by Benjamin Libet dates all the way to 1983 (Libet et al. 1983) but, perhaps oddly, only now are intentions researchers fully grasping its significance. This pre-cognitive awareness is hardly an isolated phenomenon deriving from the explosively growing body of research in neuroscience.²

To accompany neuroeconomics and neuromarketing, we now even have the research topic of neuroentrepreneurship (Stanton et al. 2008). The neuroscience perspective enables us (or forces us depending on one's receptivity) to examine the neural and biological substrates of human decision making. As noted earlier, in the early days of entrepreneurship research we focused on surface phenomena, what we say and do. Herbert Simon famously called this the *semantic* layer of human cognition. Below the semantic layer was the *symbolic* level which holds beliefs, attitudes, and assumptions. However, below that is the *neurological* layer which represents the biological substrate of cognition. (Note that all cognitive activity is neural at its heart; neuroscientists seek to explore the biological underpinnings that lie beneath conscious processing.) By delving rigorously to this level we can ask some new questions and do a better job asking (and answering) existing questions of great interest.

Consider too that entrepreneurs are increasingly the focus of neuroscientists in research at Cambridge and Vanderbilt. However, these studies need involvement by entrepreneurship scholars. Focusing purely on risk taking or managing hot cognitions makes a contribution but think of the opportunities to do even more.³

The Cambridge study (Lawrence et al. 2008) assumed that entrepreneurs need to manage emotion-laden decision making ("hot" cognition) and concluded that the neurological evidence argued that this is highly learnable. However, that skill applies to far more than entrepreneurs; entrepreneurship scholars could help narrow their focus (see Chap. 15).

The Vanderbilt study (Zald 2008) assumed that entrepreneurs are inherently risk takers and found that those high on sensation-seeking propensity have more receptors for dopamine (greater rewards for stimulating activity). Given that the entrepreneurship field has largely debunked risk taking as a predictor, how might we guide future research? What if this neurological propensity anchors individuals to prefer risky activity and if they also have a deep belief such that their mental prototype of "entrepreneur" includes "risk taker"?

Neuroscience is not just clever theory with glitzy multi-color brain images. It has practical implications too. Consider the experiment where subjects are asked to watch a video and count the number of times that a basketball is passed. In mid-video, a person in a gorilla suit walks through the screen and well over 50% of the

²In North America, there are at most 2000 entrepreneurship scholars and educators, but well over 25,000 neuroscientists. The pace of research in this area will continue to explode and entrepreneurship scholars would be well served to identify ways to collaborate (e.g., Krueger and Day 2009).

³See also the nascent efforts in neuroentrepreneurship under the aegis of the Experimental Entrepreneurship ("X-Ent") group at the Max Planck Institute of Economics in Jena, Germany.

observers fail to notice (Simons and Chabris 1995). What does that say to educators and practitioners? We are wired to be relatively blind to change; if our attention is focused in one direction, it can be very difficult to notice something else. The marketplace is filled with “gorillas” and the entrepreneur who notices the “gorilla” reaps a competitive advantage. Or does she? If you are looking closely for the gorilla you may fail to notice the basketball passes. Where we choose to focus our intentions may be critical. We need to study this but we also need to make sure students and practitioners are aware of phenomenon such as this.

For another example, the area of the brain that processes spatial relationships tends to grow significantly larger in long-time London cab drivers (Maguire et al. 2006). Where might we see such hypertrophy in, say, serial entrepreneurs?

“My brain made me do it!” Experiments in the spirit of Libet make a persuasive case that many times, our brain generates intentions not only before we are aware of them but occasionally despite our conscious attempts to change them. Think back to Socrates’ question of why anyone would intend evil or stupid behavior. If intentions are merely the resultant vector of various unobserved neural or hormonal activities, the brain can make choices contrary to what we would develop “logically.” So where might we start looking to explore what might really be driving intentions? We return again to deep beliefs.

2.3.2.2 Deep Beliefs

Most human decision making occurs anyway via automatic processing. Over-simplifying a bit, we possess a large set of if-then rules to guide our behavior. Many decisions simply derive from a relatively limited set of decision rules based on an equally limited set of very deep anchoring assumptions. Only relatively few human decisions are processed mindfully and even there we might find these deep assumptions still in play. Consider the “three-year-old” technique of surfacing deep assumptions. We ask “Why do you do this?” and with each answer, you respond as a 3-year-old might with another “Why?” It may take seven or eight rounds of “Why?” before you identify the anchoring assumption, not a task we would undertake routinely.

As such it becomes very important to understand as best we can what deep assumptions lie beneath our intentions (Krueger 2007). Moreover, these assumptions also represent the critical architecture of how we structure our knowledge (including our cognitive scripts, schemas, and maps). This certainly seems to be the next frontier in entrepreneurial intentions research, if not entrepreneurial cognition in general, and we urge the reader to give significant thought to these issues.

Role Identity. Consider, for example, role identity and related constructs like 3d role demands. Our mental prototypes of “opportunity” and “entrepreneur” differ widely and are almost certainly anchored by powerful deep assumptions. These beliefs need not be functional for even experienced entrepreneurs but it is likely that novice entrepreneurs will hold beliefs that are incorrect or simply limited (Krueger 2007). Despite the effort required to surface these deep beliefs, it may be the only way to truly understand these mental prototypes that are so important (e.g., Baron 2004, 2006).

Sapir–Whorf: Deep Cultural Beliefs? Here is an example of a broad, complex research question that demonstrates the range of solid issues raised by studying entrepreneurial intentions. Can you intend to be an entrepreneur, if there is no word for “entrepreneur”? An interesting, if philosophical question that might prove extremely fascinating and of great potential utility in public policy is the one raised by the Sapir–Whorf hypothesis from anthropology. At its simplest, it asserts that if there is no word for an activity in a culture, it is very hard for members of that culture to conceptualize that activity to any significant degree. That is, it reflects a deep belief or the absence of one needed for genuine entrepreneurial activity. While we can readily envision that entrepreneurs (as we know them) have existed since the dawn of human commerce, no ancient language has a word that remotely captures our modern meaning. The modern word “entrepreneur” is itself only a few hundred years old. It might be very telling to see a linguistic analysis that compares the words used to describe entrepreneurs with economic development.

Deep Beliefs and Relevance to this Book. Most of the other chapters in this book are either critically dependent on deep beliefs or help mold them. Chapter 11 on scripts Chap. 5 on cognitive maps are two obvious places to begin thinking about deep beliefs, how they arise, and how they affect entrepreneurial decision making. These chapters in particular offer focused, detailed insights that tell us how deep beliefs can play out and how scripts and maps in turn influence how our deep beliefs can evolve.

Consider also that self-efficacy beliefs can affect mental prototypes and role identity through critical life experiences and self-efficacy can, in turn, influence how other beliefs change (Bandura 2001; Neergaard and Krueger 2005 and especially Chap. 19).

It would seem more than plausible that entrepreneurial passion reflects truly deep anchoring beliefs (Melissa Cardon, Mateja Drnovsek, Chuck Murnieks) as would entrepreneurial emotions (Isabell Welpe). The “lenses” that filter our perceptions are likely influenced greatly by deep beliefs (Evan Douglas) as would our patterns of causal attribution (Kelly Shaver), control beliefs (Erik Monsen and Diemo Urbig), other decision making processes (Veronica Gustavsson), and our processes of enacting opportunities (Connie Marie Gaglio).

However, do we not wish for prospective and current entrepreneurs to have a mindset that supports successful entrepreneurial thinking? That requires an understanding of what that mindset might comprise, whether we refer to the expert mindset discussed in Chap. 6 or we refer to “informed” intent as discussed by Hindle and Klyver.

What are the deep beliefs that consistently characterize a truly informed intent? What are the deep beliefs that underlay the cognitive scripts of expert entrepreneurs (Chap. 11)?

2.3.2.3 Deep Beliefs and Relevance for Teaching and Practice

However, all this is of equal, if not greater importance to educators and practitioners when we restate the issue in terms of how do we learn those assumptions? How do our deep knowledge structures arise and how do they influence (and are influenced by) entrepreneurial learning (Krueger 2009)? And consider again all the growing

evidence from neuroscience that this deep “wiring” (whether innate or learned) is germane to how entrepreneurs think and act. For an entrepreneur to become fully mindful of the string human propensity toward change blindness should prove to be of significant practical value. Let us next turn to this very question.

2.3.2.4 Implications for Entrepreneurial Learning and Pedagogy

What we are learning has enormous potential implications for entrepreneurial education (and in some ways we see best practice in pedagogy that fits the dynamic model of intent even better than the static case). Consider Fig. 2.3 carefully. The process of learning (and ideally the process of educating) does much more than add knowledge content to the learners. The old behaviorist model of students as relatively passive vessels to be filled with information has largely given way to the constructivist model which assumes that the real objective of education is to help learners to evolve how they structure that knowledge. In short, train minds not memories.

However, it is equally important to recognize that while this process may increase their attitudes and intentions toward entrepreneurship, we must also increase them in productive directions. To inspire an ill-informed student to launch a venture borders on the negligent. Isn’t what we want to do is move learners from a mindset more like that of a novice entrepreneur toward a mindset more like that of an expert entrepreneur? We proposed the term “informed intent” for a symposium of the ICSB and as you will see from their chapter, Kevin Hindle and Kim Klyver have advanced the concept considerably. But that construct hinges on that expert mindset

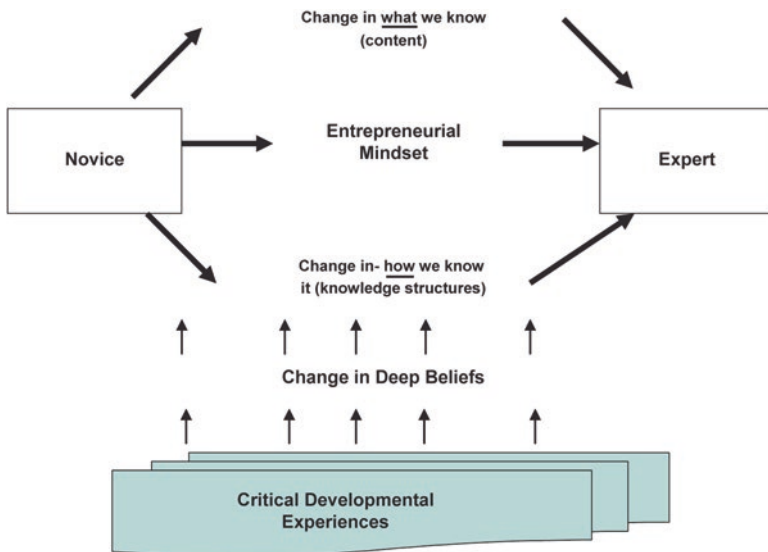


Fig. 2.3 Changing deep beliefs: critical developmental experiences

which is reflected in cognitive scripts (Chap. 11) and maps (Chap. 9) and those chapters will address these issues in much greater depth.

Nonetheless, it is important for the reader to know we have ample to reason to believe that (a) the expert mindset exists and (b) we can use what we know about the expert mindset to guide our teaching (e.g., Mitchell 2005; Krueger 2009) to move learners toward a truly informed intent. The constructivist model teaches us that learners' intentions and related attitudes will change but only insofar as they reflect changes in deep anchoring beliefs (Krueger 2009). To change how we structure what we know, especially in the direction of a more informed, expert intent, the learner goes through multiple critical developmental experiences that change their deep beliefs. (Learners will thus need guidance from those who share or understand deeply the expert entrepreneurial mindset.)

Why is this important and why is this important to our discussions here about entrepreneurial intentions? It is important to emphasize the need for a more expert, informed intent. But it also speaks to the possible reality that even under reciprocal causation, intentions may drive attitudes more than the reverse. That is, the process may begin with some initial intent. To the degree that we can help anchor learners with this informed intent at the outset, learners benefit.

2.4 Key Future Research Directions

This chapter promised the researcher a broad, rich view of the many research opportunities offered by entrepreneurial intentions. We have thus far identified several critical areas of research: Deep beliefs, identifying critical development experiences, and formally testing Bagozzi's theory of trying (with special attention to implementation intentions) but it may not yet be clear how these fit together.

To that end, we offer three different ways that we might profitably take a deeper look at entrepreneurial intentions:

- (1) Explicitly test for reciprocal causation
- (2) Explicitly test for contingencies
- (3) Explicitly test the impact of deep beliefs on "phase changes" as intentions evolve
- (4) Explicitly testing a "stepwise" model of how intentions evolve

2.4.1 *Reciprocal Influence Model*

Intent and Action—Dynamic Not Static Another important area that we have already begun to address is moving from static models toward different dynamic perspectives. We have already argued that we need to test models that do not assume unidirectional causality. It is highly likely that we will find reciprocal causality to be the norm, just

as we find in other dynamic cognitive processes (e.g., Allport 1935). While this argues immediately for monitoring intentions and their assumed antecedents longitudinally, the discussion above argues the utility of three particular aspects. The first is that if intent is initially anchored on some deep assumptions, we need to identify those. (We discuss that below.) The second is that we need to explore the cognitive consequences such as post-decision attributions. Third, the theory of trying and the work on implementation intentions argue that we need to do a much better job of understanding perceived barriers to (and facilitators of) entrepreneurial action.

Entrepreneurial Rationalization? However, what if we confirm that intentions influence attitudes significantly more than the reverse, even with significant reciprocal causation? Recall that Shaver (2007; also his Chap. 17 here) argued that we need to include the attributional perspective, that we should identify the reasons that entrepreneurs have for their intentions. Note that beneath those surface attributions are likely deep anchoring assumptions that we need to find.

Barriers and Triggers. Another nonlinearity that the theory of planned behavior cannot directly help us with is the partial volitional control that characterizes many entrepreneurial behaviors. Shapero (1982) argued that central to the entrepreneurial event were those factors that either facilitated entrepreneurial action or offered a perceived barrier. Adding barriers to the model adds to the messiness, but isn't it interesting that outside of Bagozzi—and entrepreneurship researchers—it is rare to see intentions research that deals overtly with barriers or facilitators (Krueger 2003)? If you realize that rigorous analysis of entrepreneurial barriers is painfully rare, the reader should be able to see fertile ground for extensive study that will add genuine value to our understanding of entrepreneurship. Consider, for example, the interaction between deep beliefs and barriers. Different motivations and different volitions might manifest itself in the barriers and ways to avoid them that entrepreneurs perceive.⁴ But it also would provide genuine value to educators: Consider the diagnostic value of an instrument that rigorously assessed perceived entrepreneurial barriers.

2.4.2 Contingencies

Another “messiness” that has arisen of late with the intentions model is that the paths by which intentions evolve may vary systematically. For example, Krueger and Kickul (2006) found that the cognitive style index had a sizable impact on the intentions model. In fact, the model was specified differently for those scoring with an intuitive cognitive style than for analytic style. For an example from leadership studies, Anderson et al. (2006) found gender-specific construct perceptions in leadership. That is, the same scale might measure consistently different things for different people. Or do variables such as gender or cognitive style actually change the decision calculus?

⁴This “walls and holes” model surfaced in discussions at Max Planck in 2008 by volume authors Diemo Urbig, Erik Monsen, Alan Carsrud, Malin Brannback, and this author.

But what other contingencies might yield similar results? Two strong possibilities can be found in this book. How might passion change the model? For example, Keynes argues that “animal spirits” were the real motive force behind enterprising activity (Brannback et al. 2006). Intentions when one believes that powerful others dominate your key outcomes might well differ from intentions when one has a very strong internal control belief. Also, studying entrepreneurs would permit us to see if intentions evolve differently under pure risk than under pure uncertainty.

Three other seemingly obvious contingencies remain untested. What about differences in the intentions model between necessity entrepreneurs and opportunity entrepreneurs? Should we not see meaningful differences between high and low entrepreneurial intensity? Differences in regulatory focus (promotion versus prevention) are already considered to generate different cognitive scripts (e.g., McMullen and Shepherd 2002; Baron 2004).

2.4.3 *Deep Beliefs and Phase Change Model*

Cognitive developmental psychology has long noted that human psychosocial development occurs in reasonably distinct stages connected by transition periods that are inherently experiential (Erikson 1980). In children, it is the “terrible twos” that demarcates infancy and early childhood. We see very different knowledge structures in these different stages; we also see consistent (and diagnostically useful) phenomena that characterize transition. This affords us a good sense of someone’s psychosocial development and how to help them navigate transitions. What if entrepreneurial intentions evolve similarly, exhibiting phase changes?

Phase Changes. If we plot intentions against a key attitude such as self-efficacy, we tend to see evidence that the optimal fit is not linear. It may be that noise and measurement error are amplified unpredictably, but one can also make the case that we are actually seeing one or two inflection points in the data that reflect a phase change in the evolution of entrepreneurial thinking.

That is, as entrepreneurial intentions evolve, they go through different stages. Just as entrepreneurial ventures move from ideation to nascency to launch, might not intentions follow a similar pattern, moving from one cognitive regime to another? (Consider Drnovsek’s troika of inventor, founder, and developer.) If so, we should see interesting cognitive differences between the regimes.

How do knowledge structures differ across the phases? What are the critical developmental experiences associated with each phase *and* with each transition? (Fig. 2.3) Such evidence would also be of invaluable diagnostic assistance to educators and to practitioners.

An Illuminating Controversy? One of my favorite controversies recently is the sizable fraction of subjects in the PSED database who are nascent and have been for years. They have not launched; they have not quit; they are still trying. Are they

simply noise or do they represent something very interesting?⁵ Beyond the obvious idea of applying the theory of trying to them, isn't there a construct question here? In a world where so many people want to start a business and so many people want to believe that they are, maybe all our research has missed a very important point. Intent without the right action is not intent, it is dreaming. (Do I intend to start a business? Yes! Do I expect to start soon? Not necessarily.)

However, a nascent entrepreneur is committed (or believes she is) to a course of action. What do we gain if we identify nascency as the genuine "intending"? The careers literature distinguishes a stage prior to intent, "interest" (e.g., Lent et al. 1994). Might this also suggest a three-stage phase change model: Interest, Intent, Launch? Even if this is too limiting, this thought suggests that we may want to think long and hard about where "intent" really begins?

Deep Beliefs. However, if deep anchoring beliefs influence entrepreneurial intentions but influence differently as intentions evolve, then we might well identify different specifications for the model. Consider differences in motivation and volition (Ach 1910), Heckhausen (2007) in this simple thought experiment suggested by Elfving et al. (2008). One music entrepreneur believes "I am an entrepreneur. Therefore I start a business." The other believes "I am passionate about music. Being an entrepreneur enables that." One has passion for entrepreneurship, the other for music, yet both start a music business. It might be relatively straightforward to identify what lies beneath those surface beliefs. Kets de Vries (1996) argued from a psychoanalytic perspective that all humans have critical core beliefs that trigger significant action.

In any event, we would again propose that if this approach is valid, then we should see very different cognitive regimes for each phase: different scripts, schemas and maps, and different deep anchoring beliefs. Returning to our previous discussion on education and learning, we should also be able to identify the critical development experiences that correspond to different phases and especially to the transitions.

2.4.4 *Stepwise Model*

Finally, consider one additional frontier for entrepreneurship research. How many studies merely ask about starting a "business"? Instead we need to drill down into the facets of the intended business (e.g., Krueger et al. 2009). That is, consider the related notions of effectuation (Sarasvathy 2001) and bricolage (Baker and Nelson 2005).

While entrepreneurs may have a strong, well-developed intent toward launching a venture, their path may change dramatically. Even if the overall intent and attitudes need not change significantly, their intent toward the "next step" may change radically. As such, we would argue that it might be quite rewarding to monitor entrepreneurial intentions at both the overall level and for each step of their trajectory.

⁵This issue was raised by the book editors and gratefully acknowledged.

2.5 In Sum...

I began with the metaphor of the old phlogiston theory. Our existing model of entrepreneurial intentions is no phlogiston; Its underlying theory base remains strong as ever. But like oxidation, we may well find a model whose theory is even stronger and whose ability to explain, predict and to be useful to educators and practitioners is significantly better.

Studies of pre-entrepreneurial behaviors demonstrate a dizzying array of successful (and unsuccessful) patterns and sequences of activities. There simply is no single optimal path—based on behaviors. Intentions remain critical to our understanding. However, looking at entrepreneurial intentions suggests that we need to re-think how entrepreneurs arrive at their intent. That re-think will contribute to how we teach/train and how we counsel entrepreneurs.

Consider the PSED “perma-nascents” who reflect a process where applying cognitive science offers us some new clues. Who knows what *else* we will find? I am honored to lead off this book but every chapter in this book will be useful and provocative in this journey.

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Chapter 3

Is Research on Entrepreneurial Intentions Growing? Or...Just Getting Bigger?

Norris F. Krueger

3.1 Introduction

Reflecting on this chapter written in 2009, it is gratifying that research published on entrepreneurial intentions has exploded. It is nearly impossible to pick up an issue of an entrepreneurship journal and not find a study that involves entrepreneurial intentions.

Some basic statistics from Google Scholar: From 2009 to date, there are 593 references with “entrepreneurial intentions” in the title; for the prior 6 years, there were 168. That is more 3.5× increased. For comparison, “entrepreneurship” in the title rose from ~11,700 to ~25,600, a little more than 2× increase. Entrepreneurship may be growing rapidly as a research topic, but entrepreneurial intentions research is exploding.¹ Even the seminal chapter by A.L. Shapero from 1984 (Shapero and Sokol 1982) has seen its citations grow from 793 (pre-2009) to 1470 (post-2009).

However, I look at the predictions (and prescriptions) of this chapter and see little progress. I see reviews and meta-analyses that point out much the same thing and... little or no progress:

Is it time for concern?

Is it time to do something?

If so, what exactly should we start doing? (And *who* is the “we”?)

¹My own citations have grown even faster, suggesting that the most-cited articles get the most new cites. In turn, that suggests that newer, different work on intent may not be getting enough attention?

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Let us look at one particular arena of intentions research that is definitely getting bigger but hard to see as truly growing.

3.1.1 Example: Measuring Impact of Entrepreneurship Education

As I write this, I am helping finalize a large structured literature review from the last 5+ years of studies on the impact of entrepreneurship education in higher education. Of the ~200 studies, by far the biggest outcome variable is the entrepreneurial intent of the learners. Nice to be cited, but it's also troubling. Blindly applying an intentions measure is questionable both theoretically and methodologically. Blindly tossing the data into a structural equation model doesn't help either.

Very few studies even did a pre/post; only a few had a control group. Only a handful pretested their instrument on their population. And almost all of them reported that whatever the pedagogical intervention, the result tends to be higher intentions, and if they used a full model like the theory of planned behavior, the model almost always held. TPB may be an incredibly robust model, but these results make me wonder if we have a significant "file drawer" problem.

It is also troubling that most authors failed to triangulate the intention's results or at least position them conceptually in the local context. Few even took the opportunity to extend the model with new measures. Two interesting exceptions to note: First, Mair and Noboa (2006) position the basic model for greater applicability to social entrepreneurship by converting the two desirability measures where "attitude" was measured by "empathy" and social norms were measured by "moral obligation." These are two constructs that are neither malleable nor easy to measure, but the effort is to be saluted. We need more studies like this, rather than blindly follow the TPB.

Second, Souitaris et al. (2007) added "inspiration" to the model, giving an explicit link to emotional outcomes (something also mostly neglected that we encouraged repeatedly in *The Entrepreneurial Mind's* first edition). This study also was designed as pre/post with control group and pretested instrument. We really need more studies like this.

But it raises the question: Why so few studies move beyond simplistic research designs (and underwhelming samples and "usual suspect" methodologies)? Obviously, even good journals are accepting this. Do we need to better educate reviewers and editors?

Returning to this chapter, it reconfirms prior reviews (Nabi, et al., 2016) in 2004 (Pittaway and Cope 2007) and major meta-analyses (Martin et al. 2013; Bae et al. 2014). To wit, theory is weak and/or blindly applied (and mostly TPB) with typically disappointing research designs and/or data and pedestrian methodology (again, often applied blindly). And things do **not** seem to be getting any better.

So why does all this matter? Because the **same** comments can be made for studies of entrepreneurial intentions. The recent structured literature review by Fayolle

and Liñán (2014), Schlaegel and Koenig (2014), and Paiz and Brinckmann (2014) is all eerily similar. All are deeply sympathetic to the theory of planned behavior, but they too wonder about theory, as well as research design, measures, methodology, and samples.

Is it the robustness (and simplicity) of the model that makes intentions research so scholar friendly? Its ubiquity makes it immune to reviewer scrutiny? Is it that key gatekeepers do not see the issues? (And isn't it up to us to address these?)²

Is it any consolation that the broader literature on behavioral intentions fares little better? When in doubt, use TPB and plug it into SEM. Most disconcerting, we never see questions of whether "intent" is even the right question to ask.

Let's shift gears and take a look back toward the original questions posed in the chapter and elsewhere in *The Entrepreneurial Mind* and beyond. Have we addressed those opportunities since publication? At first blush, the answer is not encouraging. However, if anything, the opportunities have since grown in quantity and quality.

3.2 Antecedents of Changes in Entrepreneurial Intent

We already discussed that in the context of entrepreneurship training and education. Given the practical importance of this, seeking an influx of high-quality research seems a top priority. However, what we really need are "gold standard" studies. We have seen experimental work starts to appear in entrepreneurship (e.g., Gielnik et al. 2015), and research champions like the Ewing Marion Kauffman Foundation (Reedy 2014) continue to push for RCT.³

3.2.1 Antecedents Within TPB?

One of the most striking results the original chapter noted was that it is no longer clear that TPB and its variants are truly a formative model (rather than reflective). Are social norms really an antecedent that drive intent or are they at least partly a rationalization that reflect existing intent? The chapter reports a study that makes it seem crystal clear that we are looking at a dynamic process through a static snapshot. Good for raising r^2 (and happy reviewers?) but what are we giving up? In 2009, we called for more studies that addressed intent as a dynamic

²Not to make this essay a call for a volume on "New direction in entrepreneurial intentions research" but it does seem much overdue, especially with the new data sets at our disposal like GUESSS, GEM, etc.

³The US Department of Education's What Works Clearinghouse (<http://ies.ed.gov/ncee/wwc/>) tests impact studies for generalizability. While scary to think how few of our studies would pass the test, that also suggests a huge opportunity with both practical and research implications.

process, but we still have seen few pre/post studies let alone studies that modeled intent dynamically. Research designs still tend to be primarily posttest.

3.2.2 *Competing Models*

Again, we see few competing model studies anywhere in entrepreneurship. Two notable exceptions are Winkel et al. (2013) that compared TPB with the self-efficacy-centered social cognitive change theory (SCCT) and Schlaegel and Koenig (2014) which integrated Shapero's model with TPB in the context of a meta-analysis. I recommend both of these. One possible opportunity would be to assess variations in TPB based on measures, something vanishingly rare since Krueger et al. (2000).

3.2.3 *“Entrepreneur” Is a Verb?*

Intent is a psychologically important construct but action is even more important. Why such few studies that make the leap from intent to action? What inhibits or facilitates the process is something we have neglected to a painful degree. In part, that has been a data problem but with newer databases like GUESSES (Sieger et al. 2014), we can now move forward. So why haven't we? (One very recent exception: Shirokova et al. 2015, using GUESSES.)

It also suggests the possibility that we are measuring “intention” improperly. When we think we are “intending,” are we? The PSED found that having taken at least one concrete action toward launching was a potent predictor. Worth asking: Could nascency be the real “intent?”

3.2.4 *Measures*

Measurement is more important than perhaps we realize. A related issue is that we have assumed that the remarkable robustness of the intentions model allows us to be cavalier about the actual specification of the model. Moreover, we have perhaps been even more cavalier about our measures. For example, we are inconsistent on the time frame. We ask “do you intend to start a business” in general or in some specific time frame, and too often we conflate all of these as if they are exactly comparable. Why is this almost never addressed?

We need rigorous assessment of our measures. The twin opportunities here are to (a) figure out parsimonious measures that make sense and increase the comparability of studies, (b) create new measures that might fit a specific domain better like Mair and Noboa or extend the model like Souitaris, and (c) rethink what “intention” really means or is it even the right question.

Consider the latter. In entrepreneurship education and training, our research designs focus on increasing intent. But what about lowering intent for people who are not

ready? Isn't that an important outcome? And why are there essentially no studies that address that? As suggested elsewhere in *The Entrepreneurial Mind*, it is rare enough to see studies that assess entrepreneurial intent in comparison to another career.

3.2.5 *Methods*

The very structure of our models like TPB are tailor-made for selecting regression-based models and not even econometric models which are better suited for complex, dynamic processes like... intent. The future lies in part on our moving past that to embrace great tools like graph databases and fsQCA (fuzzy set qualitative comparative analysis).

3.3 Beyond Intent: The Entrepreneurial Mind-Set

Maybe "intent" is not enough. It is past time to focus on what we can learn from neuroscience (Krueger 2007; Krueger and Welpe 2014). It is quite in vogue to talk about how we need to cultivate and support a stronger entrepreneurial "mind-set." We have talked in *The Entrepreneurial Mind* about informed intent, but "mind-set" moves far deeper cognitively. Intent is an attitude that is close to the surface cognitively, while informed intent addresses content knowledge and skills, which are also relatively surface phenomena.

Of what value is a strong intention without the cognitive resources to make it realistic? On the other hand, if intent is a relatively short-term phenomenon, then can mind-set be seen as longer-term, more general intent? The realm of "neuro-entrepreneurship" is still very new; the science is hard but the effort will be worth it (Krueger and Welpe 2014).

More importantly, this helps us with doing much better research into the impact of our pedagogical interventions. If the aim of our training and education includes changing learners' thinking at a deep cognitive level, then we have to start there. Ask the hard questions of what it is we are trying to change and we can fruitfully approach it. The recent OECD-LEED effort, Entrepreneurship360, has taken a solid start (Krueger 2015; Lackeus 2015)⁴.

We need to move away from a research model that in essence says "Something happened, let's use TPB and SEM." I urge the reader to ask themselves these questions:

Concern #1: **Do we have the right research design?** (And samples?)

Concern #2: **Do we even have the right measure(s)?** (And methods?)

Concern #3: **Is intent even the right question to ask?**

Does the world need yet another intentions study that differs only in its setting or sample? No matter how well crafted, does that study help?

⁴While I was honored to be involved, I strongly urge reading Lackeus (see Entrepreneurship360 website).

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Chapter 4

Perceptions: Looking at the World Through Entrepreneurial Lenses

Evan Douglas

4.1 Introduction

It is said that entrepreneurs look at the world through different eyes, see the future better than others do, see opportunities that others do not see, do not see risks that others do see, and so on. But maybe it is not their eyes that make entrepreneurs different but the lenses through which they look. Lenses can change one's view of the world, compensating for deficiencies in our visual acuity or helping us see things in a different way. Lenses bring objects into focus, make objects seem closer or further away, reduce or increase the amount of light admitted to the eyes, change the color of things, and so on. The analogy of looking through lenses can help us understand the thinking and the behavior of entrepreneurs, so in this chapter we examine the lenses that entrepreneurs (metaphorically) look through as they form the intention to behave entrepreneurially and as they exploit entrepreneurial opportunities.

Perceptions are important at various points in the entrepreneurial process. At the beginning of this process, individuals form the intention to become entrepreneurs and enter the “exploration phase” (McMullen and Shepherd 2006; Choi et al. 2008). The formation of entrepreneurial intentions might precede, or follow, the discovery of the specific entrepreneurial opportunity to be exploited. For some, the formation of the general intention to become an entrepreneur will trigger the search for a desirable entrepreneurial opportunity, while for others the discovery of a specific and desirable entrepreneurial opportunity might trigger the formation of entrepreneurial intentions. Bhave (1994) calls the former case “internally stimulated opportunity recognition” and the latter case “externally stimulated opportunity recognition.” In the former case

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the individual enters the exploration phase wanting to be an entrepreneur and may explore many entrepreneurial opportunities before settling on one to “exploit” (McMullen and Shepherd 2006) when a sufficiently attractive opportunity presents itself. The alternative case, where the individual discovers the opportunity first and subsequently decides to become an entrepreneur, is exemplified by the scientist who previously had no intention of becoming an entrepreneur, preferring instead to do research and publish papers, but who discovers a new technology and subsequently gains intellectual property protection for that technology. This individual might then be “pushed” (Smilor and Feeser 1991) by members of his/her social network, and perhaps also by investors, to commercialize the proprietary technology, and consequently forms entrepreneurial intentions and enters the exploration phase of the entrepreneurial process.

In the exploration phase, individuals are “nascent entrepreneurs” meaning that they are actively planning to start their own business (Shaver et al. 2001). In this phase they conduct viability screening on one or more new venture opportunities they perceive. The viability screening process involves gathering information about the resources needed to exploit the specific new venture opportunity, considering whether or not these resources can be assembled to produce and sell the new venture’s product or service, and investigating whether there is a sufficient market for that product or service at a price level that will allow profits.

At some point in the exploration phase of the entrepreneurial process, nascent entrepreneurs will form the belief that they have collected enough information and subsequently make the decision to launch the new venture. At this point they enter the “exploitation” phase (Choi et al. 2008) and the nascent entrepreneur becomes an actual entrepreneur and realizes his/her entrepreneurial intentions. In the exploitation phase, the new venture may survive, prosper, and grow, or it may survive as a small-scale business without having any desire for further growth, or it may become bankrupt and not survive. The new venture’s subsequent fortunes will depend on the competitive forces that it experiences following its entry into the market, the entrepreneur’s (managerial) ability to cope with those competitive forces and the potential vagaries of customer demand, and the entrepreneur’s preferences for a growth or a no-growth (perhaps “lifestyle”) business (Barringer and Ireland 2006, 13–14).

The entrepreneurial process takes place in a highly uncertain business environment. When introducing new products, new services, new business processes, and/or new “business models” (Morris et al. 2006) it is not possible to foresee accurately the outcomes of decisions that are made. Vagaries on both the cost and demand sides could deliver financial outcomes that range from fortune to ruin. In order to act decisively in a highly uncertain environment, entrepreneurs must act on what they see, or more correctly, on what they *think* they see, or what they think they *will see* as the scenario rolls out with the passage of time. So, entrepreneurs in a highly uncertain business environment must act upon their perception of reality (Krueger 1993; Krueger and Brazeal 1994; Forlani and Mullins 2000). What entrepreneurs think they see might be an illusion, of course, and their new venture might consequently fail. Alternatively what they think they see, or think they will see, might

prove to be an accurate vision of the future. Thus entrepreneurs' perception of their entrepreneurial opportunity is critical to their subsequent exploration and exploitation decisions and to their later success or failure.

The process of entrepreneurship involves the nexus of a specific individual and a specific opportunity (Shane and Venkataraman 2000), and we note that entrepreneurs not only tend to perceive opportunities differently but also tend to perceive themselves differently. They tend to see themselves as more competent than non-entrepreneurs see themselves. That is, they tend to have higher self-efficacy (Ajzen 1991; Krueger and Dickson 1994). Self-efficacy refers to a person's confidence that he/she can accomplish a specific task or related set of tasks. Entrepreneurial self-efficacy relates to the tasks specific to the exploration and exploitation phases of the entrepreneurial process (Chen et al. 1998). This confidence may be based on their possession of superior knowledge about the entrepreneurial opportunity, due to their superior knowledge of market needs and/or the technological potential for serving those needs (Gifford 2003; Gimeno et al. 1997; Shane and Venkataraman 2000). But, in addition, entrepreneurs tend to exhibit *overconfidence* in their abilities (Palich and Bagby 1995). Overconfidence is a common human foible, of course, but entrepreneurs tend to be more overconfident than others (Busenitz and Barney 1997; Simon et al. 2000). And, of course, entrepreneurs may be different from non-entrepreneurs in their preferences for monetary outcomes and nonmonetary outcomes (Douglas and Shepherd 2000).

Accordingly, in this chapter we examine a series of metaphorical lenses through which entrepreneurs perceive reality during the entrepreneurial process. Each of these lenses refers to perceptual differences between entrepreneurs and non-entrepreneurs that cause entrepreneurs to seek less information about potential new business opportunities and thereby causes them to proceed further and with greater speed along the entrepreneurial pathway. These individual differences thus serve to propel the entrepreneurial individual toward an entrepreneurial venture that may succeed or, alternatively, end in failure.

4.2 The Clear-Lens Effect: Differences in Human Capital, Including Knowledge

Do you wear glasses or contact lenses? In any case, you will appreciate that my glasses would most likely be inappropriate for your eyes—they would almost certainly blur your perception of the things around you, because visual acuity differs across human beings. If your eyes have less than perfect natural correction for refraction, you can have a set of lenses made up by an optometrist to a particular prescription that is exactly matched to your eyes so that you will see more clearly. Typically these will be clear lenses that correct your inability to focus on items at different distances.

How does the clear-lens analogy relate to entrepreneurs? The clear lens of the entrepreneurs refers to their ability to see and understand “things entrepreneurial” better than non-entrepreneurs do. That is, the clear lens of the entrepreneurs relates to their prior knowledge and experience of entrepreneurial situations and behaviors. Becker (1964) introduced the term human capital to encompass one’s knowledge and abilities, and we focus here on those aspects of human capital that are specific to entrepreneurship. Some people were born to entrepreneurial parents and learned entrepreneurial attitudes, abilities, and behaviors during their childhood. Others learned to be more entrepreneurial at school or university and/or learned from experience in the workplace or at play. In effect, entrepreneurial individuals have honed their own set of clear lenses that allow them to see entrepreneurial opportunities more clearly. The knowledge acquired is specific to entrepreneurship and does not necessarily cause the person to be better at maths or to play a musical instrument well, for example, which may be the forte of others.

Many studies have attempted to relate individual human capital to nascent entrepreneurship, entrepreneurial intentions, entrepreneurial behavior, and entrepreneurial performance (e.g., Aldrich et al. 1998; Boden and Nucci 2000; Evans and Leighton 1989; Shane 2003, 61–95, for a comprehensive overview). Gifford (1993) distinguished entrepreneurial ability (the ability to recognize a new profit opportunity and to acquire resources to exploit it) from managerial ability (the ability to maintain the profitability of current operations) and argued that possession of these skills in individuals will determine their choice of career as an entrepreneur, intrapreneur, or salaried employee. Gifford (2003) demonstrated that what might seem to be risk aversion or preference might instead be the result of different personal investments in knowledge acquisition. Shepherd et al. (2000) argue that differences in new venture risk perceived by individuals might be due to individual differences between them in terms of their ignorance as producers and managers. In a similar vein, Shane and Venkataraman (2000) argue that entrepreneurs may have domain-specific knowledge that allows them to conclude that a particular new venture is not as risky *for them* as it would be for others. They argue that entrepreneurs who possess proprietary knowledge about new venture opportunities appear (to those who lack the information) to be willing to accept greater risk. Baron (2000) argues that entrepreneurs’ lower perceptions of risk relate to their lesser ability to engage in counterfactual thinking. Davidsson and Honig (2003) and Aldrich et al. (1998) argue that individuals have differing capabilities due to their differing “general” human capital (such as age, gender, years of education, and work experience) and “specific” human capital (such as relevant education and industry experience, relatives who are self-employed, and social networks). More recently, Janney and Dess (2006) argue that entrepreneurs may possess specialized knowledge and idiosyncratic resources such that risks perceived by others do not apply to that entrepreneur because he/she has superior human capital.

Greater knowledge and experience in any context affects one’s perception of risk in that context. Those with more entrepreneurial knowledge and greater entrepreneurial experience might regard a specific new venture opportunity as relatively low risk, while those with little knowledge and relevant experience might regard the

same opportunity as relatively high risk. Entrepreneurial risk can be largely traced to incomplete information (or ignorance) in the minds of consumers, producers, and managers (Shepherd et al. 2000). Shane and Venkataraman (2000) argue that entrepreneurs who possess proprietary knowledge about new venture opportunities appear (to those who lack the information) to be willing to accept greater risk. Janney and Dess (2006) argue that the entrepreneur may possess specialized knowledge and idiosyncratic resources so that risks perceived by others do not apply to this entrepreneur, who has superior human capital resources in that regard. Krueger and Dickson (1994) found that self-efficacy and entrepreneurial risk taking were positively related, indicating that entrepreneurs' confidence in their knowledge and abilities leads them to undertake more risky ventures.

The impact of human capital differences on the perception of risk can be illustrated by two people wanting to jump across a muddy ditch. One is tall and athletic, and the other is shorter and less athletic. The first person was the long-jump champion at high school, while the second was the chess champion. For the first person, jumping across the ditch seems to involve little or no risk, but there is a high probability that the second person will land in the ditch and get muddy and possibly hurt as well. The physical ability and experience of the first person (including task-specific knowledge about how to run up and launch oneself into a long jump) cause that person to have relatively high self-efficacy concerning the task, while the ability, experience, and knowledge of the second person are likely to underlie relatively low self-efficacy for this task and therefore cause a relatively high perception of risk for that person.

Heterogeneity of *social* capital may also mean that the risk perceived by one nascent entrepreneur is less than that perceived by another nascent entrepreneur. Social capital includes the benefits derived from social networks including extended family, community, or organizational groups and individuals (Coleman 1990; Aldrich et al. 1998). Social capital is expected to enhance the entrepreneur's human capital by enhancing the individual's ability to identify opportunities, gain access to resources, and so on (Birley 1985; Greene and Brown 1997). Davidsson and Honig (2003) found that while human capital variables (years of schooling, taking business classes, and work experience) had little or no impact on moving nascent entrepreneurs forward, social capital variables (having parents in business, being encouraged by friends, and having close friends or neighbors who are entrepreneurs) had substantial impact on progressing them from nascent entrepreneurship to launch. Having access to "better" social networks would be expected to provide the nascent entrepreneur with risk-reducing information at little or no cost and thus reduce the perceived risk of the proposed new venture.

Krueger (1993), Krueger and Brazeal (1994), and Krueger and Carsrud (1993) argue that the two main factors underlying the formation of entrepreneurial intentions are the perceived feasibility and the perceived desirability of the entrepreneurial opportunity. McMullen and Shepherd (2006) argue that "knowledge" and "motivation" are the prime drivers of the subsequent decision to exploit the opportunity. In effect, McMullen and Shepherd posit knowledge as a proxy for perceived feasibility and willingness to bear risk as a proxy for perceived desirability in the

nascent entrepreneur's decision to exploit the new venture opportunity. Several other authors argue that the nascent entrepreneur's possession of prior and proprietary knowledge and their consequent "alertness" underlies the formation of the intention to become an entrepreneur (Kirzner 1973, 1979; Busenitz 1996; Gaglio and Katz 2001; Gifford 2003).

The fact that a person has superior human and social capital will become apparent to that individual through interpersonal comparisons and formal or informal contests of various types, such that the person will form an opinion that his/her own capability to undertake and successfully complete specific tasks is superior to others. Accordingly, entrepreneurs tend to exhibit greater self-efficacy for entrepreneurial tasks based on their superior human and social capital that is relevant for the entrepreneurial tasks envisioned. Accordingly, they view the world through "clear lenses" that more clearly show them the outcomes associated with decision making under uncertainty in the context of specific entrepreneurial opportunities. By looking through these clear lenses the entrepreneur is able to form entrepreneurial intentions in the first place, and subsequently takes the decision to exploit and thereby move ahead with the entrepreneurial process, when others would still be seeking information.

4.3 The Rose-Lens Effect: Overconfidence

Humans are notoriously overconfident of their ability to accomplish specific tasks (Simon et al. 2000). Overconfidence in one's abilities has been likened to wearing "rose-colored lenses" (Palich and Bagby 1995, 443) whereby everything seems "rosy"—i.e., everything is bathed in a soft pink light that makes things look very attractive and/or easier to accomplish. Simon et al. (2000) distinguish between overconfidence, defined as the failure to know the limits of one's knowledge (Russo and Shoemaker 1998), and illusion of control, this being the overestimation of one's ability to control future events in uncertain situations (Langer 1975). Boyd and Vozikis (1994) argued that illusion of control will positively impact the entrepreneur's formation of entrepreneurial intention. In this chapter we are essentially rolling these two cognitive biases together and using the term "overconfidence" to mean the overestimation of one's knowledge and abilities in relation to the successful completion of a specific task. Thus the tall athletic person might still fall into the ditch if he miscalculates the width of the ditch or overestimates his jumping ability, or if a headwind begins to blow during his run-up, or if his jumping point collapses as he begins to jump, and so on. The latter two issues are beyond the jumper's knowledge or control, of course, and this parallels the entrepreneur's launch of a new venture in an uncertain business environment.

Overconfidence is a cognitive bias that seems to afflict entrepreneurs more so than other business managers. Cooper et al. (1988) found that entrepreneurs exhibit higher self-efficacy than other managers, and consequently they think that they are better

equipped to deal with risks than are non-entrepreneurs. Cooper et al. (1995) argued that higher levels of self-confidence were related to lower levels of information-search activity, and therefore greater risk bearing, due to the entrepreneur's ignorance of the risks being borne. They argued that "the entrepreneur is 'blinded' to the need for more information due to his/her overconfidence" (1995, 110). Palich and Bagby (1995) found that entrepreneurs exhibit overconfidence and tend to downplay the risk they perceive, expecting to triumph over any adverse situations that might arise. They found that entrepreneurs consistently viewed new venture opportunities more positively than others (see also Chen et al. 1998; Forbes 2005). Busenitz and Barney (1997) found that while all managers exhibit overconfidence, entrepreneurs exhibit greater overconfidence than do employed managers. Thus, although the actual risk might be perceived accurately, individuals who exaggerate their ability to cope with the perceived risk are more likely to take that risk.

So, in terms of the entrepreneurial process, individuals are more likely to form entrepreneurial intentions if they are overconfident about their ability to successfully accomplish entrepreneurial tasks, other things being equal. Subsequently, and as a nascent entrepreneur, the individual is more likely to want to hurry through the exploration phase (and undertake less information-search activity) due to his/her overconfidence that the venture is a viable business opportunity. Consequently, nascent entrepreneurs will tend to take the exploitation decision sooner than they would if they were not so overconfident, and as they progress in the exploitation phase we should expect their overconfidence to similarly cause lesser levels of information-search activity resulting in "hasty" and probably suboptimal decision making. These rose lenses metaphorically worn by entrepreneurial individuals cause them to perceive the probable outcomes of their decisions more optimistically and to thus induce them to enter and persist in the entrepreneurial process, whereas individuals with a realistic view of their own capabilities would either not enter the process or stall within the process or not take "life-saving" gambles within the process, and thus would not become practicing entrepreneurs, other things being equal.

4.4 The Blue-Lens Effect: The Use of Simplistic Decision Heuristics

The "blue-lens effect" is about sunglasses that cut down the light (and glare) that hits your retinas and thereby allows you to see more clearly the things that you are most interested in (like the road ahead, when driving, for example). Blue lenses cut down the red and green light that is admitted to the photoreceptors in the eyes and thus reduce the amount of fine detail that would be visible when the red, green, and blue lights are combined. (Think of a color (RGB) projector, where the red, green, and blue beams combine to make many other colors and thus convey the finer details to the viewer). The benefit to us of wearing blue lenses is that they cut down eye strain and allow us to concentrate on objects that would have been difficult to see

because they are surrounded by too much (multicolored) light. Thus, the decision to wear blue lenses is effectively the decision to sacrifice visibility of the finer details of the overall scene in favor of having better visibility of some items, which seem to be more important at the time.

The analogy for nascent entrepreneurs is that the red and green light sacrificed are like detailed information that the entrepreneur chooses not to have. The entrepreneur is more concerned with charging ahead along a particular road and feels that he/she does not need to have more information about “minor details” that seem unimportant to progress along that road. In the context of the entrepreneurial process, these “unimportant” things might be detailed information about customer preferences, data on the new product’s reliability, predictions regarding competitor responses to the entrepreneur’s initiatives, and so on.

Fiet (1996) notes that entrepreneurs can undertake information-search activity to reduce the uncertainty and risks of a new venture. Brockhaus (1980) and Brockhaus and Horwitz (1986) found that entrepreneurs in general are no more likely than non-entrepreneurs to be risk averse or risk preferring. Busenitz and Barney (1997) found that entrepreneurs tend to make decisions with less information than other managers. But even if they continue to receive information, individuals are subject to cognitive biases that arise due to the utilization of three main simplified decision rules (or heuristics) (Shaver and Scott 1991, 33). First, they tend to “anchor” their estimates on past outcomes and tend to not revise their estimates on the basis of new information, and thus they act upon inaccurate assumptions (Tversky and Kahneman 1974; Busenitz 1999). Second, they tend to base their decision making upon the most recently acquired or most easily recalled information. This is known as the “availability” heuristic, but of course such data may not be representative of the range of outcomes that should be expected. Third, the “representative heuristic” is the tendency to base decisions on a relatively small number of observations (Tversky and Kahneman 1974). This apparent belief in the “law of small numbers” (Busenitz 1999) whereby the decision maker places heavy reliance on a few observations (rather than a representative sample) introduces risk because the limited sample might not be representative of the range of probable outcomes. Thus, relying on a small sample causes the entrepreneur to underestimate risk (Shaver and Scott 1991; Busenitz 1999).

Shepherd et al. (2000) argue that the mortality risk of a new venture depends on the novelty of its product, its production technology, and the managerial requirements of the new venture. They explain the liability of newness (Stinchcombe 1965) in terms of the ignorance (i.e., missing relevant information) in the minds of customers, producers, and managers. This is consistent with the human capital approach—the mortality risk existing in any new venture will depend on which particular entrepreneur or entrepreneurial team is managing the new venture opportunity (as well as the market conditions and technological possibilities). Following the “ignorance” view, Choi et al. (2008) examine the “stopping point” at which entrepreneurs stop *exploring* the new venture opportunity (i.e., truncate information gathering) and start *exploiting* the new business opportunity (i.e., launch the new venture). In effect, the decision to exploit is taken at that point in the viability screening process when the

entrepreneur decides that sufficient information has been captured and that the new venture appears to be worth the gamble, and thus the intention to start the new business culminates in a new venture start-up. Thus, Choi et al. (2008) focus attention on the decision to exploit and argue that this decision will be made sooner for the entrepreneur for whom risk tolerance is greater, consumer, producer, and management novelty is lower, knowledge management orientation is explicit rather than tacit, and where potential rivals (followers) can more easily obtain the same information. In concert with the individual-opportunity nexus approach (Shane 2003) Choi et al. (2008) argue that the decision to exploit occurs in a person–situation context, depending on both the personal characteristics of the entrepreneur and situational characteristics such as novelty and ease of access of followers to important information.

But each one of the lenses discussed in this chapter operates to truncate information-search activity. The blue-lens effect specifically relates to the avoidance of information search due to the decision maker's preference to use simplified decision heuristics. Heuristics are simple “rules of thumb” that can be implemented quickly and inexpensively and which might generally produce an acceptable result. But since they eschew further information search, they may not incorporate relevant information that would improve the decision made and are thus more likely to result in suboptimal decisions being made. That is, heuristics allow quick decisions but these are not likely to be “rational” in the sense of maximizing expected value (Tversky and Kahneman 1974). Busenitz and Barney (1997) and Busenitz (1999) found that entrepreneurs practice “bounded rationality”, using simplified decision heuristics significantly more than do other managers. By using heuristics, entrepreneurs take greater risks than they think they are taking because the heuristic used actually introduces risk to the decision-making process by ignoring relevant information.

4.5 The Yellow-Lens Effect: Differences in Wealth Seeking

The yellow-lens effect is named in recollection of the author's experience while skiing at Whistler Mountain in Canada many years ago. While riding the chair lift up the mountain, my ski goggles fell off my head and disappeared down into a ravine. This was surely unfortunate, since I had just made the confident statement that I could beat my skiing partner to the bottom of the mountain, which provoked him to bet me \$10 that I could not. Skiing, and particularly racing down the mountain, would be much more dangerous without goggles—without the yellow lens in those goggles, the glare created by sunlight on the snow makes it difficult to see the moguls that have been carved out by previous skiers and snowboarders. Hitting a mogul unexpectedly may cause you to fall and possibly hurt yourself. Thus, yellow-lens ski goggles are a risk-reducing accessory for skiers and snowboarders. But as the chair lift went higher my friend was having fun saying how he would easily win the race down the mountain, and so I decided to race against him anyway, without my goggles. Yes, it would have been more sensible for me to take the time to get off

my skis and go inside the chalet and spend the money to buy a new pair of goggles, but my desire to win the bet was so strong that I stopped thinking rationally and raced down the mountain. I subsequently made my way to the bottom via a series of bone-jolting crashes over unseen moguls and lost the bet of course.

So, the yellow-lens effect for entrepreneurs relates to their urgency to get on with the wealth-making process rather than allocate a little more time and money to the exploration phase such that they gain more risk-reducing information. Both time and money are typically perceived as scarce by the nascent entrepreneur. First, consider the cost of information-search activity. Expenditure on search costs will reduce the net income of the new venture if that search does not result in the capture of additional useful information. Information that is expected to simply confirm the entrepreneur's strongly held belief, for example, that consumers will actually buy the new product or service or that production will proceed smoothly without technical problems, will be perceived as wasted expenditure that simply reduces net income. Because the entrepreneur almost certainly has a preference for more, rather than less, income, such expenditures will be seen as reducing profits from the new venture and thus reducing the entrepreneur's future wealth. Further, we note that the great majority of new ventures are "bootstrap" funded (Winborg and Landstrom 2000), and thus the opportunity cost of the funds required for search activity is extremely high, competing with prototype development, the cost of manufacturing equipment, marketing expenses, and so forth. When these opportunity costs are added to the direct cost of search activity, it may be perceived as profit maximizing to truncate information-search activity and channel scarce funds into what is thought to be a better use for those funds. But also note that the entrepreneur may think that better-quality information about market demand, technological reliability, and managerial ability will be gained soon after launching the new venture. Thus, proceeding ahead in relative ignorance may be preferred because it consumes less cash prior to launch when cash balances are critical and because it is thought likely to provide better information and thus be a more effective use of the limited funds.

Second, information-search activity requires a significant period of time to set up, to undertake, and to analyze the data derived. The first impact of this is to delay the receipt of initial sales revenues and therefore to reduce the discounted present value of the revenue stream associated with the exploitation of the opportunity. Perhaps, more importantly, the time consumed with continuing to explore rather than to exploit the new venture opportunity may be viewed as an obstacle to winning the race to be "first to market" and subsequently condemns the firm to an inferior profit stream as a follower rather than as a pioneer. The first-mover advantages (Lieberman and Montgomery 1988) of the pioneer firm are commonly presumed (by nascent entrepreneurs) to provide unassailable competitive advantage, although most pioneers do not survive or even maintain market leadership (Tellis and Golder 1996). Notwithstanding this reality, we are concerned with the a priori perceptions of nascent entrepreneurs here—the notoriously overconfident entrepreneur expects that pioneering will endow the firm with significant competitive advantages, so any delay due to information-search activity is perceived to negatively affect the net present value of the firm's profits. Whether or not the nascent entrepreneur expects

to be the pioneer, he/she may consider that the window of opportunity will soon close and that waiting to gain more reliable demand and cost estimates will mean that the profit opportunity will be lost or diminished. Entering as an early follower can be quite profitable, of course (Tellis and Golder 1996), but in markets where the early entrants “lock up” strategic resources (Barney 1991) entering later will be associated with lower profit streams and may even be associated with losses and bankruptcy. Thus the nascent entrepreneur may be expected to adopt a sense of urgency and to avoid time-consuming information-search activity in favor of an earlier decision to exploit and launch into the target market.

To summarize the yellow-lens effect, it is due to the nascent entrepreneur’s sense of urgency that the new venture should be launched sooner, rather than later, to gain higher profitability. The more wealth-seeking and materialistic is the nascent entrepreneur, that is, the more he/she values wealth and the goods and services that can be purchased from income, the more the entrepreneur will want to truncate information-search activity and rush ahead to exploit the entrepreneurial opportunity.

4.6 The Purple-Lens Effect: Differences in Intrinsic Motivation

Purple is a beautiful color that evokes visions of the rich robes of royalty, of the gowns of academic processions, and of fortunate people fulfilling their dreams and desires. People say they are having a “purple patch” when everything goes right for them. People use “purple prose” which excessively expresses their passions and emotions. Purple is the color of pleasant emotions, of good feelings, and of psychic satisfaction. Looking through purple lenses would make everything seem purplish, with the purple lenses interacting with the color of objects to become a lighter or darker purple, or some interesting new color—green things seen through purple lenses would look like chocolate brown, for example. Thus wearing purple lenses would change your perception of things and you would see these things in a psychologically more appealing light than otherwise.

The purple-lens effect for entrepreneurs is that they perceive more intensely the emotional benefits associated with an entrepreneurial opportunity, as compared with others who look at the same new venture opportunity. Although we commonly think of profit and growth as the main objectives of entrepreneurs, they pursue entrepreneurship for both monetary and nonmonetary gains. Thus entrepreneurs want to be entrepreneurs partly because of the psychic benefits associated with becoming and being an entrepreneur.

The most commonly cited psychic benefit of being an entrepreneur is “being my own boss” (see, for example, Barringer and Ireland 2006, 6–7; Shane 2003, 106). All individuals want some degree of independence, manifesting itself in decision-making autonomy, but entrepreneurs seem to self-select on the basis of having a higher preference for decision-making autonomy. Various studies have shown that preference for independence is significantly and positively related to the formation of entrepre-

neurial intentions (e.g., Douglas and Shepherd 2002) and significantly distinguishes entrepreneurs from non-entrepreneurs (Shane 2003, 106–108). Accordingly, entrepreneurs are expected to get more psychic satisfaction out of being their own boss, which is a nonmonetary corollary of becoming an entrepreneur.

Next, entrepreneurs have been shown to have a higher need for achievement (McClelland 1961) than non-entrepreneurs. Achievement has been defined as follows: “To accomplish something difficult. To master, manipulate, or organize physical objects, human beings, or ideas. To do this as rapidly, and as independently as possible. To overcome obstacles and attain a high standard. To excel one’s self. To rival and surpass others. To increase self-regard by the successful exercise of talent” (Murray 1938, as cited by Shaver and Scott 1991, 31). Surely this is exactly what entrepreneurs do—entrepreneurship provides people who have a high need for achievement a suitable and accessible way to accomplish something difficult, to overcome obstacles, to excel one’s self, and so on.

Digging down a layer, what are the specific achievements that entrepreneurs might really prize? We contend that being recognized as the pioneer in a new market and/or industry may be an achievement of great personal significance to many entrepreneurs. Under the yellow-lens effect we considered the monetary aspects of being the pioneer and gaining first-mover advantages—now, with the purple-lens effect, we are concerned with the psychic benefits of getting to the market quickly and winning the title of pioneer, separate and distinct from any monetary benefits of doing so. Another psychic reward associated with entrepreneurship is recognition for being the intellectual source of great new ideas. Gaining patents has traditionally been a badge of achievement for inventors and many inventors subsequently become entrepreneurs to exploit their inventions. Other innovative ideas, perhaps not patentable, are also widely attributed to entrepreneurs, such as the “invention” of new business models by Michael Dell, by Sam Walton (Walmart), and by Home Depot hardware stores.

Next, being recognized as persons responsible for the rapid growth of their new ventures is personally rewarding for many entrepreneurs. Growth is fraught with risk, since rapid growth associated with new technologies might cause a financial crisis for the new venture if expenses must be paid contemporaneously while revenues are collected with a lag due to credit terms allowed and late payments by customers. Successfully managing the rapid growth of a firm can be expected to generate personal satisfaction for the entrepreneur, which is quite distinct from the satisfaction associated with making profits and/or becoming personally wealthy. Finally, taking a new venture to an initial public offering (IPO) is a huge achievement for entrepreneurs, since relatively few new ventures survive, fewer become highly profitable, and still fewer result in an IPO that allows the founder to realize substantial capital gains. Foreseeing such psychic benefits, and being attuned via their preference structures to gain greater satisfaction from such achievements, the nascent entrepreneur looks at the entrepreneurial process in a much more positive light than does the non-entrepreneur—the nascent entrepreneur sees the exploitation of an entrepreneurial opportunity as a means to achieve these keenly desired emotional benefits.

4.7 Telescopic Lenses: Overestimating Benefits and Underestimating Time and Risk

Telescopes use multiple lenses to magnify what is viewed through these lenses. The situation being observed looks larger than it really is and, moreover, seems to be much closer than it really is. This analogy highlights the way that entrepreneurs tend to overestimate the magnitude of the profits from a new venture opportunity and simultaneously underestimate the proximity of those profits. This is a separate perceptual problem from overconfidence, which addressed a bias individuals have about their ability to cope with specific situations—here we are concerned with the typical entrepreneur’s overestimate of the profitability of the new venture and the associated underestimate of the time it will take to set up the new business, gain customers, get paid for sales, get down the learning curve, and so on.

Looking through telescopic lenses certainly gives the entrepreneur the broad picture, and the combination of telescopic and clear lenses may endow the entrepreneur with exceptional “vision” that may be the main reason for the discovery of the new venture opportunity in the first instance. But telescopic lenses compress the finer details of distant things, and these details may become the main impediments to gaining greater profits in a shorter time. As in most new situations, the broad visionary view seems relatively simple and manageable—the “devil is in the details” as people say. Acting upon a telescopic perception of the new venture opportunity will cause the decision to exploit to be taken before it would be if the opportunity was perceived through a single set of clear lenses, since the latter would allow perceptions of problem areas that would require more information search and problem analysis to be undertaken prior to the decision to exploit.

Now, if you were to reverse the telescope and look through the smaller end, objects would seem to be much smaller and to be much further away than they are in reality. But this is what entrepreneurs seem to do when they consider the risks facing the new business venture. They may see them, but they may mistakenly conclude that they are miniscule and far away. For example, entrepreneurs who say “no-one else is doing this, we have first-mover advantage, and therefore we will have sustainable competitive advantage” are likely to be looking through the telescope the “wrong” way. First, there may be others already doing it somewhere, but their cursory scan of the landscape, seen through the wrong end of the telescope, makes existing competitors hard to notice, causes first-mover advantages to appear to dominate smaller but potentially more problematic features of the landscape, and may not reveal as-yet small developments that are likely to grow and render the entrepreneur’s first-mover or other competitive advantages easy to copy or obsolete (Barney 1991).

Note that overconfidence is not the same as overestimation of outcomes or underestimation of risks (Sitkin and Pablo 1992). Overconfidence is concerned with self-efficacy that exceeds the individual’s capacity to successfully achieve the task at hand. The telescopic-lens effect, on the other hand, concerns the individual’s failure to correctly estimate the size and complexity of the entrepreneurial situation. In the

rose-lens effect the perceptual error is about one's own capacity, whereas in the telescopic-lens effect the perceptual error concerns the characteristics of the new venture opportunity and the competitive environment.

4.8 Framing the Lenses

While talking about looking through lenses, it would be remiss to ignore the role of the frames that hold the lenses, since they are also critical to how the entrepreneur perceives new venture opportunities. Frames are the structures which surround the lenses and which serve to align the lenses with the eyes such that a person can see through those lenses. Researchers have found that when eliciting information from others, such as in a survey, the way in which a question is “framed”, i.e., the context in which the question is considered, has a profound effect on the answer provided. Tversky and Kahneman (1974) introduced “prospect theory” in which the framing of a situation affected the risk behavior of individuals—when the decision maker is presented with a specific decision-making situation that is framed in a positive light, the decision maker would exhibit risk aversion, whereas when framed in a negative light, the decision maker would exhibit risk-seeking behavior. Positive framing of a situation might be as simple as saying “there is a 50% chance of success” whereas negative framing of the same decision problem would be to say “there is a 50% chance of failure”. Researchers have found that when the situation is positively framed, the decision maker will tend to act conservatively to protect prior gains, whereas when framed negatively the decision maker will tend to gamble in an attempt to capture some gains from the situation (Tversky and Kahneman 1974; Busenitz 1999).

In the context of entrepreneurship, we see entrepreneurs practice “escalation of commitment” by increasing their investment into projects that are not doing very well and, conversely, by holding steady with strategies that have served well in the past, despite new information arising that indicates that the strategy undertaken may not be appropriate for the current circumstances (Tversky and Kahneman 1974; Shaver and Scott 1991). Both of these actions may jeopardize the entrepreneur's chances of success, of course, yet the entrepreneur's perception of the decision problem is effectively constrained by the frame through which he/she is looking at the problem, and the decision-making process is defective in that the entrepreneur's perception is distorted because of the frame through which the decision problem is perceived (see, Sitkin and Pablo 1992; Sitkin and Weingart 1995).

4.9 Summary and Conclusion

In this chapter we are concerned with the perceptions of entrepreneurs and how these might differ from the perceptions of non-entrepreneurs. We are interested in entrepreneurial perceptions because these may explain why entrepreneurs step forward to

undertake the process of entrepreneurial new venture formation while others hang back and instead choose employment with an established business or other organizations. We illustrated these perceptual differences using the analogy of looking through lenses of different colors. We argue that viewing new venture opportunities through these different lenses causes individuals to be more likely to perceive entrepreneurship as a feasible and desirable career alternative, and thus they are more likely to subsequently form the intention to become an entrepreneur. Thus entrepreneurial individuals become nascent entrepreneurs and enter the exploration phase of the entrepreneurial process whereby they search for risk-reducing information as part of the viability screening process. They also seek information about the availability and accessibility of the resources required to launch the new business venture. At some point, the nascent entrepreneur decides that enough information has been gathered and decides to exploit the new venture opportunity and subsequently transforms from a nascent entrepreneur to an actual (practicing) entrepreneur.

In each phase of the entrepreneurial process, perceptions play a role in driving the individual forward to become a practicing entrepreneur. The clear-lens effect, which is due to greater self-efficacy for entrepreneurial tasks arising from the individual's underlying knowledge and human and social capital advantages that better equip him/her for entrepreneurial actions, allows the entrepreneur to better see the future demand for new products, services, and/or business processes and to better predict the evolution of new technology to serve human preferences and subsequent market needs. Risk analysis is considered from the viewpoint of superior knowledge and human capital, which means that the risk looks smaller through the entrepreneur's eyes, aided as they are by clear lenses. Greater knowledge also means that the entrepreneur will better understand the market and the technology and will make fewer mistakes as a manager in the exploitation phase of the entrepreneurial process.

The rose-lens effect, due to the overconfidence which characterizes entrepreneurial individuals, causes the individual to optimistically inflate the value of entrepreneurial opportunities by overestimating his/her ability to solve problems, to achieve cost and revenue targets, to meet deadlines, to judge the preferences of consumers, and so on. This will tend to hasten progress through the opportunity recognition process and the exploration phase as the nascent entrepreneur underestimates the difficulties and the risks likely to be associated with the new venture. Once into the exploitation phase, the rose-lens effect inhibits the entrepreneur's accurate assessment of market demand, of cost estimates, and so on and thus pushes the entrepreneur forward in the entrepreneurial process when others might have abandoned the process.

The blue-lens effect, due to the excessive use of simplistic heuristics and other cognitive biases that cause decisions to be made without proper data or sufficient analysis, may cause the entrepreneurial individual to make "poor" decisions to proceed ahead in the entrepreneurial process when others would have delayed the decision or abandoned the opportunity. Thus the entrepreneur may select an opportunity for exploration on the basis of simplistic analysis or the exercise of one or more cognitive biases, such as representativeness, availability, and anchoring. In both the exploration and exploitation phases the blue-lens effect causes the entrepreneur to

proceed ahead, potentially ignorant of risks being taken, rather than to commit more time for deeper analysis of the decision problem.

The yellow-lens effect, which is due to the entrepreneur's urgency to gain first-mover advantages and the higher profits that first moving is expected to provide, causes the nascent entrepreneur to truncate information search because it costs money and takes time and both of these are perceived to jeopardize the profits to be made from the new venture. Thus the yellow-lens effect causes nascent entrepreneurs to move forward more rapidly in the exploration phase, and to take more risks in the exploitation phase, than would non-entrepreneurial individuals.

The purple-lens effect, which is due to the entrepreneur's greater passion for the process of entrepreneurship and for the achievements and recognitions that are expected to be associated with becoming and being an entrepreneur, causes the entrepreneurial individual to proceed forward in the entrepreneurial process where others would stall, because the entrepreneur tends to place a higher intrinsic value (than others do) on the nonmonetary aspects of becoming and being an entrepreneur.

The telescopic-lens effect describes the bias of perceiving opportunities to be bigger than they really are, to be closer (in time) than they really are and, conversely, to be less risky than they really are. Finally, framing effects were discussed to demonstrate that the way in which an opportunity is presented to the entrepreneur is likely to cause a cognitive bias toward risk aversion (if framed positively) or toward risk seeking (if framed negatively).

Of course, entrepreneurs tend to look through more than one and possibly all of these lenses simultaneously, but we have tried to disentangle the impacts of each of the main factors that collectively operate to induce the individual to proceed more quickly along the path of the entrepreneurial process. Each lens operates to cause the entrepreneur to reduce information-search activity, and thus each lens causes the entrepreneur to accept greater risk, both knowingly and unknowingly, than otherwise, and to increase the incidence of entrepreneurial new business start-ups.

So, are these entrepreneurial lenses a good thing or a bad thing? For individuals they might be either, since they induce the individual to proceed with the entrepreneurial process to an outcome that lies somewhere on a spectrum that ranges from huge success to dismal failure. Indeed, a high proportion of entrepreneurial new ventures do fail (Dunne et al. 1988; Cooper et al. 1988) and most of these failures might be largely due to management ignorance (Shepherd et al. 2000) because most new ventures do not start until there is at least some evidence that the new technology "works" and that there is unmet customer demand. It is up to the entrepreneur (and other members of the top management team) to then launch the new venture and manage the production, marketing, and other business processes. In the management of these business processes clear lenses are a definite advantage, but the other lenses may inhibit effective management processes, perhaps leading to entrepreneurial failure.

For society, these entrepreneurial lenses are overwhelmingly a good thing. If nobody wore these lenses, then nobody would step forward to start new ventures (Busenitz 1999), and we might still be living in caves. Entrepreneurs take private risks seeking personal gains, to be sure, but successful entrepreneurship is likely to

provide societal benefits as well. These external benefits of private entrepreneurship include technical progress, increased productivity, safer living environments, better natural environments, higher standards of living, and so on. Consequently, at a societal level, we encourage the wearing of these entrepreneurial lenses, applauding successful entrepreneurs, and this induces individuals to form entrepreneurial intentions and become involved in the entrepreneurial process. This encouragement for entrepreneurial activity occurs in schools and universities and also in government- and university-supported technology and business incubators.

Thus there is a crucial role for entrepreneurship educators. We need to provide the voice of reason, educating individuals in risk-recognition skills and risk-mitigation strategies to ensure that entrepreneurs have a better awareness of the extent of their ignorance (such that they might “know what they do not know”) and how to cope effectively with new venture mortality risk and business risk more generally. Entrepreneurship education will also serve to enhance entrepreneurial alertness (opportunity recognition skills) and viability screening skills. Accordingly, it serves to build human (as well as social) capital and therefore builds entrepreneurial self-efficacy, and thus performs the role of the optometrist in supplying clear lenses to potential entrepreneurs, reducing their managerial ignorance in particular. In addition, entrepreneurial education should be designed to reduce overconfidence and to reduce the use of simplistic decision rules by providing an awareness of the suboptimality of such cognitive biases and heuristics. Finally, entrepreneurial education almost certainly serves to increase the number of entrepreneurial new ventures by promoting the financial and psychic benefits associated with successful entrepreneurship. We hope that by grinding and polishing the individual’s clear, yellow, and purple lenses and by discouraging the wearing of rose and blue lenses, entrepreneurial educators will have a significant positive impact on the incidence and success rates of entrepreneurship.

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Chapter 5

Perceptions Revisited: Continuing to Look at the World Through Entrepreneurial Lenses

Evan Douglas

5.1 Afterthoughts

It is instructive to consider entrepreneurial perceptions through the lens of the theory of planned behavior (Ajzen 1991). As is well known to entrepreneurship researchers, the theory of planned behavior argues that actions are preceded by the formation of intentions, which are in turn preceded by attitudes toward the outcomes of the action. Krueger et al. (2000) argued that entrepreneurial intentions depend upon the individual's perception of the perceived desirability and the perceived feasibility of the entrepreneurial action.

The perceived desirability of entrepreneurship can be envisioned as the psychic utility expected from the outcomes of entrepreneurship. These expected outcomes are both monetary and nonmonetary rewards, with the latter including the net satisfaction associated with decision-making autonomy, risk exposure, work effort, and work enjoyment (Douglas and Shepherd 2000). Expectancy–valence theory (Vroom 1964) allows estimation of the perceived desirability of an expected outcome of a contemplated action. The desirability of any one expected outcome depends on the magnitude of that outcome (the expectancy) weighted by the individual's attitude to that outcome (the valence), which provides a measure of the utility part-worth of that outcome. The total utility (or desirability) of an action can therefore be measured as the sum of the utility part-worths of the expected outcomes (see, e.g., Douglas 2013). Thus, alternative entrepreneurial opportunities can be ranked by their expected total utilities to determine the most desirable course of action.

At this point the individual has not yet formed the intention to become an entrepreneur. It remains to be determined whether that action, while the most desirable,

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is the most appropriate for the individual to take. Accordingly, the theory of planned behavior would then direct attention to the “perceived feasibility” of the most desirable entrepreneurial opportunity. Self-determination theory (Deci and Ryan 1985) argues that individuals have an innate psychological need to achieve competence in their actions and to avoid failure. Accordingly, the individual would then consider whether or not they believe they are being capable of successfully completing the tasks that they perceive to be involved in the exploitation of the most desirable entrepreneurial opportunity. Thus, they consider their “entrepreneurial self-efficacy” (Boyd and Vozikis 1994; Zhao et al. 2005) which is a measure of their self-confidence that they can successfully complete entrepreneurial tasks. Fitzsimmons and Douglas (2011), using a median split of their measures for perceived desirability and perceived feasibility, found that not only the “high–high” category (who they called “natural” entrepreneurs) but also the “high–low” category (inevitable entrepreneurs) and the “low–high” category (accidental entrepreneurs) also intended to undertake entrepreneurship. Thus, the conscious personal choice to proceed to action, based on the perceived desirability of an entrepreneurial opportunity, awaits the “green light” of perceived feasibility before entrepreneurial intentions are fully formed.

The “lenses” approach to entrepreneurial perceptions has thrown some light on the antecedents of entrepreneurial intentions. The “clear-lens” effect refers to entrepreneurial alertness (Kirzner 2009; Tang et al. 2012), whereby knowledge of both sides of the demand–technology nexus serves to increase the perceived desirability (via reduced risk) and to increase the perceived feasibility (via increased confidence) of entrepreneurial action. The “rose-lens” effect concerns entrepreneurial overconfidence, or the perception that one can handle the risks that are inherent in an action. The impact of overconfidence is to increase the perceived feasibility of entrepreneurial success. The “blue-lens” effect, which is the reluctance to extend search activity (and search costs) due to the presumption that all necessary information is to hand, and/or the dismissal of pertinent information as unnecessary or irrelevant, operates to not reduce (i.e., leave wrongly inflated) both the perceived desirability and perceived feasibility of entrepreneurial action. The “yellow-lens” effect, or the preference to truncate search costs to pursue the profits associated with first-mover advantages, similarly operates to not reduce (i.e., leave wrongly inflated) both the perceived desirability and perceived feasibility of action. Finally the “purple-lens” effect, or the preference for the nonmonetary (psychic) benefits of entrepreneurial action, operates to increase the perceived feasibility of entrepreneurial action.

Although intentions are considered the best predictor of actions (Ajzen 1991; Krueger et al. 2000), they do not universally transform into actions, and if they do, the time lag between intentions and action is highly variable. Panel studies of nascent entrepreneurs reveal that many intending entrepreneurs report that they are “still trying” to launch after several years of observation (Reynolds et al. 2004). More recently, several authors have questioned the veracity and timing of the intentions–action link (Gielnik et al. 2014; Van Gelderen et al. 2015). How long should we expect to wait while intending entrepreneurs are “still trying” (Bagozzi and Warshaw 1990) to get started? It is clear that apart from the perceived desirability

and perceived feasibility preconditions, there must be other factors that need to be satisfied before the intentions–action link is completed.

The missing link between intention and behavior is *motivation*, a topic which has been neglected in the entrepreneurship literature, according to Carsrud and Brännback (2011). Motivation can be interpreted as the propensity to act (Shapiro 1982) rather than to delay action despite the intention to undertake that action sometime in the future. Later, Gollwitzer and Brandstatter (1997) argue for an “implementation intention” that follows the goal intention (e.g., to be an entrepreneur) and which must be formed if the action is to be implemented. Similarly, Bagozzi et al. (2003) offer a model of “effortful decision-making and enactment.” Here, we will simply refer to entrepreneurial motivation as an internally driven compulsion to proceed with a contemplated entrepreneurial action.

Choi and Shepherd (2004) distinguished the exploratory stage of the entrepreneurial process from the exploitation phase. The exploratory phase is characterized by a learning process about the qualitative and quantitative aspects of the prospective new venture. The formation of entrepreneurial intention, following the conscious or subconscious consideration of perceived desirability and perceived feasibility, therefore takes place in this exploration phase. In the exploitation phase, the nascent entrepreneur assembles the necessary resources, launches the new venture, and begins trading as an independent economic entity. It is the gap, or the lag, between the exploration and exploitation stages that is of interest here.

A cursory examination of the issues that might intervene to delay entrepreneurial action in the nascent entrepreneurship stage reveals five main factors. The individual’s perceptions of these factors will accelerate or decelerate the transition from entrepreneurial intentions to entrepreneurial actions, depending on whether these perceptions are positive or negative and accurate or inaccurate.

The first factor relates to the delays involved in assembling the necessary resources, particularly financial capital. The nascent entrepreneur may not yet be regarded as “investment ready” by investors (Douglas and Shepherd 2002) or credit worthy by banks or family members and may need to undertake actions to reduce the risk of the new venture before launching it, such as conducting market research and refining the prototype of the new product or service. The nascent entrepreneur might gain new information on the market or the technology from this search behavior that serves to negate prior assumptions and necessitate a “back to the drawing board” setback to the proposed date for the launch of the new venture. The additional time taken to assemble resources may also relate to the failure to attain the mileposts or time frames envisioned in the business planning process, such as the hiring of employees, installation of plant and equipment, contracting with suppliers and distributors, and so on.

A second group of delaying factors relates to changes in the macroeconomic environment of the nascent firm or simply the perception that business conditions may change adversely in the near to medium future. Adverse shifts in interest rates, exchange rates, the willingness of lenders to lend, the preferences of investors, and other factors may slow the nascent entrepreneur’s progress toward launching the new business ven-

ture. Launching in adverse macroeconomic conditions could also serve to heighten new venture mortality risk beyond the individual's limits, thus halting forward motion until the risk-return trade-off is once again acceptable to the nascent entrepreneur.

Thirdly, the activities of actual or potential rivals may cause the nascent entrepreneur to pause while reevaluating the prospective competitiveness of the new venture's value proposition. A rival may unexpectedly get to market first with the focal value innovation and usurp the nascent entrepreneur's expected first-mover advantages. New product or services announced or brought to market, whether in the same or in complementary product categories, may materially change market prospects as perceived by the nascent entrepreneur. The arrival of a disruptive or imitative innovation (see Christensen 2006) embodying a superior value proposition relative to the nascent entrepreneur's will necessitate a rethink (and rework) of the nascent venture's product attributes, with consequent delays in attaining launch of the new venture.

Fourth, the target customers of the nascent venture may change their attitudes and behaviors, with adverse impact on the venture's projected revenue stream. In the time that it takes to gear up for market entry, the window of opportunity may close, or at least shift in an adverse direction, such that it would be imprudent to launch the venture without a reconfiguration of either the product's attributes, the production process, or the business model to better suit the needs of the target customers and the current market dynamics.

A final factor that may delay the launch of the new venture is preventative self-regulatory behavior on the part of the nascent entrepreneur (Brockner et al. 2004; Fitzsimmons and Douglas 2011). It is contended by these authors that the promotional self-regulatory behavior of individuals in the opportunity recognition stage of the entrepreneurial process gives way to a more conservative investigation of the veracity of prior assumptions made, before taking the decision to launch. The passage of time since the opportunity recognition (or discovery) phase may have generated previously unrecognized employment or self-employment options for the nascent entrepreneur, such that a reevaluation of the individual's opportunity costs causes them to prolong their current employment or accept a more remunerative employment opportunity rather than start the new venture.

In summary, the transition from entrepreneurial intention to entrepreneurial action requires the motivation to complete the nascency stage of the entrepreneurial process. The individual may encounter setbacks or become stalled in the nascency stage due to (a) delays in assembling the necessary resources, (b) the deterioration of macroeconomic or industry conditions, (c) the unexpected actions of rival firms, (d) changes in the preferences or circumstances of the target market, and (e) a reevaluation of the desirability and feasibility of undertaking entrepreneurial action after the passage of time in the nascency phase during which new information and new employment prospects may have eventuated.

We can see that the nascent entrepreneur's perceptions of these five sources of potential delay will play an important role in reducing the intentions–action lag. First, the “clear-lens” effect will act to speed up the transition because more complete information, meaning lesser managerial ignorance (Shepherd et al. 2000), will

avoid the delays (and search costs) associated with information search activity and reduce the uncertainty about macroeconomic changes, rival actions, customer preferences, and opportunity costs of the nascent entrepreneur. That is, the better informed or more knowledgeable is the individual in the intentions formation stage, the better informed we expect them to be in the nascency stage of the entrepreneurial process. If one or more of these delaying events were to occur unexpectedly in the nascency stage, the more knowledgeable nascent entrepreneur would be more able to understand its causes and consequences and would more quickly adjust the new venture's trajectory to accommodate the new reality,

Second, the "rose-lens" effect, which relates to the optimism and overconfidence of the nascent entrepreneur (Busenitz and Barney 1997; Forbes 2005; Cassar 2014), is likely to be positively related to the speed of transition from entrepreneurial intention to entrepreneurial action. Recall the rose-lens effect is to recognize the risk but to believe the situation is manageable by the nascent entrepreneur. Thus, whatever unexpected events occur to delay the launch of the new venture, the more optimistic and more overconfident nascent entrepreneur is likely to recover from the impact and move ahead more quickly than would the less confident and less optimistic nascent entrepreneur.

Third, the "blue-lens" effect, which results in the neglect of available information to save time and search costs in the intentions formation stage, would continue to cause the individual to look for shortcuts or heuristic decisions to save time and search costs, in the nascency stage of the entrepreneurial process. Thus, we would expect a positive relationship between the blue-lens effect and the speed to launch of the new venture, other things being equal.

Fourth, the "yellow-lens" effect, which reflects the individual's urgency to assume the role of pioneer and benefit from the first-mover profit advantages, would also be manifested in greater speed to launch in the nascency process. The greater sense of urgency to be the first mover would presumably induce the nascent entrepreneur to move faster to circumvent any obstacles encountered, possibly interacting positively with the blue-lens and rose-lens effects. Thus we would expect a positive relationship between the yellow-lens effect and the speed to launch of the new venture, as well as these suggested interaction effects.

Finally, the "purple-lens" effect, which relates to the utility part-worth of the nonmonetary rewards of becoming an entrepreneur, should be expected to positively influence the speed to launch the new venture, since the expected utility of being recognized as entrepreneur (and possibly the pioneer) might be expected to increase the nearer the individual gets to the prize. If so, the utility part-worth of the psychic benefits of being an entrepreneur would increase and at least partly offset reduction in the utility part-worth of income or the increase in the (disutility) part-worth of risk that are occasioned by unexpected obstacles and adverse events that may occur during the nascency stage. Thus, we might expect there be a positive relationship between the purple-lens effect and the speed to launch of the new venture.

In summary, the motivation of the individual to complete the nascency stage of the entrepreneurial process in a timely manner is likely to be strengthened by the various perceptual lenses that entrepreneurs tend to utilize in their decision-making.

Note that it is the individual's perception of these things that count—perception is reality for nascent entrepreneurs in their uncertain environments where all data is prospective. They may be right, or they may be wrong, but they have to do something. And, in the case of entrepreneurial nascency, doing nothing is doing something—it is a real option to wait and see whether a situation is temporary or permanent, whether new information is forthcoming, whether assumptions are supported or denied, and so on. But the more that nascent entrepreneurs utilize the various metaphorical lenses argued in the chapter, the more we would expect them to proceed with alacrity through the nascency phase to achieve the launch of their new venture, other things being equal.

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Part II
Contexts, Cognition, and Entrepreneurial
Expertise

Chapter 6

Toward A Contextual Model of Entrepreneurial Intentions

Jennie Elfving, Malin Brännback, and Alan Carsrud

6.1 Introduction

This chapter challenges the existing views of entrepreneurial intentions by proposing a contextual model of entrepreneurial intentions (EIM). It builds upon the prior work of a broad range of researchers, including those represented in the other chapters in this cluster on entrepreneurial intentions within this volume. This chapter also builds on the work of Elfving (2008), which bridges self-efficacy, motivations, and intentions. As is been shown in the chapters in this volume, the ideas adapted from social cognitive theory have widely impacted entrepreneurial research, especially the work in entrepreneurial intentions. While the implementation of perception and cognition has certainly increased our understanding of entrepreneurial behavior and despite the relatively large number of studies done there is really only one model that has been empirically tested to such an extent that it can be viewed as reliable and useful. Although that work is not complete. When studying why people choose to become entrepreneurs and continue being entrepreneurs, it remains one of the most influential models with respect to entrepreneurial cognitions. This model is called the entrepreneurial intention model and was developed by Krueger and his associates (see, for example, Krueger 1993; Krueger and Brazeal 1994; Krueger et al. 2000). The model is illustrated in Fig. 6.1.

The model proposed by Krueger and his associates draws heavily on the work of Ajzen and Fishbein and their theory of planned behavior (described in Chap. 13) as

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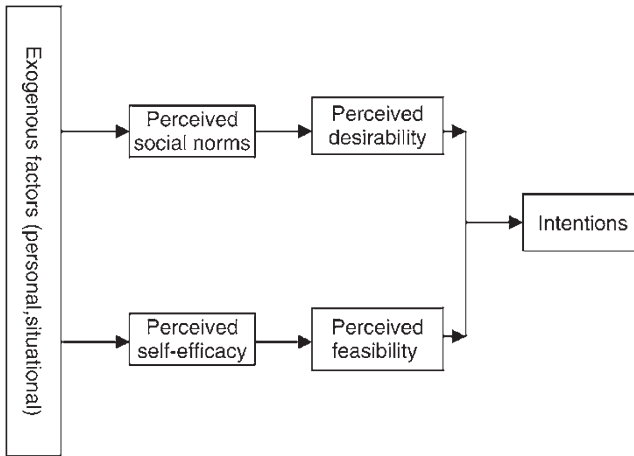


Fig. 6.1 The classic entrepreneurial intentions model. *Source:* adapted from Shapero and Sokol (1982), Krueger (1993), Krueger and Brazeal (1994), and Krueger et al. (2000)

well as on the work of Shapero (Shapero and Sokol, 1982) and his *theory of the entrepreneurial event*. Shapero's work (Shapero, 1975, Shapero and Sokol, 1982) focused on factors which make an entrepreneurial event, such as venture creation, happen. His conclusion was that entrepreneurial events are a result of interacting situational and social-cultural factors. Each entrepreneurial event occurs as a result of a dynamic process providing situational momentum that has an impact upon individuals whose perceptions and values are determined by their social and cultural inheritance and their previous experience.

The greatest reason for an entrepreneurial event is a change in the person's life path, e.g., the loss of one's job, a midlife crisis, or an opportunity to take the risk after a financial situation becomes more secure. Changes in one's life path alone, however, are insufficient conditions for an entrepreneurial event to occur. Other influencing factors are, e.g., background, previous experience, and one's perception of feasibility. The division between perceived feasibility and perceived desirability, central in Krueger's model, also originate from Shapero's model (Shapero and Sokol 1982).

Drawing on these arguments, Krueger (1993) created the entrepreneurial intentions model. The entrepreneurial intentions model assumes that perceived feasibility and perceived desirability predict the intentions to become an entrepreneur. Perceived social norms and perceived self-efficacy are antecedents of perceived desirability and perceived feasibility (Krueger and Brazeal 1994). Social norms have not always had a significant impact (Krueger et al. 2000). However, one also has to consider that social norms could be expected to vary across cultures, i.e., in some countries, social norms are more supportive of entrepreneurial activity than in others (McGrath and MacMillan 1992; Davidsson and Wiklund 1997; Krueger and Kickul 2006).

According to the model of planned behavior, perceived desirability or personal attitude depends on the perceptions of the consequences of outcomes from performing the target behavior: their likelihood, negative and positive consequences, and both intrinsic and extrinsic rewards (Ajzen and Fishbein 2005; Kuratko et al. 1997).

In short, we are talking about a perceived expectancy framework. Perceptions are dependent on the social context and on what can be regarded as personally desirable. What kind of behavior is considered worthy of a reward and what is not will vary across cultures and societies.

6.2 Social Norms

The social norm measure is a function of the perceived normative beliefs of significant others, such as family, friends, and co-workers, weighted by the individual's motive to comply with each normative belief. Social norms often reflect the influence of an organizational and/or community culture and provide guidelines for what in a culture is regarded as desirable. It is both a very interesting and a very complicated component in the model. Many researchers, however, tend to claim that social norms do not explain additional variances in intentions for would-be entrepreneurs (Krueger et al. 2000). Which certainly may be true within a given culture, but few studies have compared across cultures and societies. Kickul and Krueger (2004) pointed out that if social norms are valid constructs, cultural contexts should be reflected in them, perhaps not as a real measure but at least as a proxy.

One problem when measuring the impact of social norms is that social norms tend to vary both across cultures (McGrath and MacMillan 1992) and within cultures (Davidsson and Wiklund 1997). For example, in the United States, starting one's own business is usually considered a measure of achievement and personal success and thus attracts admiration and praise. In Finland, however, the general reaction is often a mix of awe and envy (Carsrud et al. 2007). While bankruptcy is probably never considered something to aim for, it is not the "end of the world" in the United States. In fact, there are those who regard it as an effective learning process (Shapiro 1975).

However, in countries such as Australia, Finland, and Sweden and indeed in most of Europe, those who have gone through bankruptcy will be marked for life (Carsrud et al. 2007; Gustafsson 2006). In Finland, too much success can also be as much of a sin as failure. This is also true in Latin cultures where extreme success is perceived to mean others have not done well as a result, the concept of "limited good." Consequently, in general, Americans perceive entrepreneurship as much more desirable than Finns or even Canadians. Furthermore, Bryant and Bryant (1998) showed that as social norms in a community change that in turn alters what is more likely to be considered an opportunity. In short, to identify which factors can be labeled as social norms, i.e., to know what to measure may be more difficult than measuring the social norms themselves.

Another challenge when measuring social norms is identifying the correct reference group. The reference group for an entrepreneur or a potential entrepreneur is not necessarily only family and friends, but may actually include colleagues and business partners (Carsrud et al. 2007). Once again this is a context-specific issue. In some countries or cultures, the impact of family may be greater than in others. Recent work by Carsrud et al. (2007) showed it might be useful to distinguish between different kinds of social norms. In this study, they separated general social norms from family social norms and showed that each impacts entrepreneurial intentions differently.

The reference group, or role models, can be somebody to look up to, but in some cases, it may equally well be somebody you can be familiar with. If you look at somebody who has started a company and you think “He is no smarter than I am. If he can do it I can do it” that might well function as a triggering event (Shapero 1975).

6.3 Self-Efficacy

As will be stated in both Chaps. 13 and 19, self-efficacy is one’s sense of competence: a belief that we can do something specific (Bandura 1977, 2001). Self-efficacy is a strong driver of goal-oriented behavior (Baum and Locke 2004; Bandura 1977, 2001). Desiring to do something, however, is not enough to lead to intentions. A belief that one can actually do it is also required. For instance, gender and ethnic differences in work preferences and performance can often be traced to differences in self-efficacy. Kourilsky and Walstad (1998) compared perceptions of knowledge with actual knowledge of entrepreneurial skills and showed that although the skill levels of boys and girls were comparable, girls were more likely to feel ill prepared. This might be the result of the gender role of femininity in which self-awareness is stronger, for discussion on this factor, refer to Chap. 13. Support for this was found by Wilson et al. (2004) who demonstrated a direct relationship between self-efficacy and intentions in girls and highlighted the significance of girls’ self-efficacy on their entrepreneurial aspirations. As mentioned above, for a more detailed discussion on self-efficacy, the reader is referred to Chap. 19.

6.3.1 *Collective Self-Efficacy*

Self-efficacy can also be collective, i.e., support from other organizational members of an intention can be needed to support an intention. Perceptions of collective efficacy are likely to be important (Bandura 1986, 1995). It can be expected that collective self-efficacy enforces social norms and low collective self-efficacy may decrease high personal self-efficacy so as to ultimately inhibit action, i.e., social norms, self-efficacy, and culture are tightly interconnected.

6.3.2 *Self-Efficacy as Task-Specific Cognitions*

Researchers also point out the importance of “career self-efficacy” as a domain or task-specific construct (Boyd and Vozikis 1994; Betz and Hackett 1981; Lent and Hackett 1987). Career self-efficacy refers to the perception of self-efficacy in relation to the process of career choice and adjustment. Self-efficacy has been found to predict stated occupational interests and occupational choices among college students

(Betz and Hackett 1981; Lent and Hackett 1987). Boyd and Vozikis (1994), therefore suggesting that career self-efficacy may be an important variable when studying how entrepreneurial intentions are formed in the early stages of a person's career. However, they also indicated that entrepreneurial intentions were often a result of previous work experience and therefore were not always very strong immediately after graduation, and moreover even if a graduate student did have strong entrepreneurial intentions they might not be acted upon until they had gained enough experience to provide the level of confidence necessary to anticipate venture success (Boyd and Vozikis 1994; Shane 2008). Once again the reader is referred to Chap. 19.

6.4 Revising Basic Assumptions About Intentions

Both the theory of planned behavior and the entrepreneurial intentions model are widely used for predicting entrepreneurial intentions and behavior. Using the software "Publish or Perish" (www.harzig.com), 180 references to the entrepreneurial intentions model can be found. This is clear evidence that although some minor changes have been suggested and implemented, the basic structure of the model has remained robust and is commonly accepted. One wonders, however, if that is because the model really is so reliable and well functioning, or whether it is perhaps because no one has made a serious attempt to question the basic assumptions in the model? Brännback et al. (2006a) suggested it might be time to put the model to test and to revise it critically. Considering the wide usage of the model that is indeed a brave suggestion, but it might be needed in order to develop the field of entrepreneurial cognition research.

When reviewing and revising the intentions, model two different questions must be asked. First of all, are there significant errors in the current models that need to be deleted or corrected? Second, are there any significant variables missing from the model? Starting with the first question, recent work by Brännback et al. (2006b), Krueger and Kickul (2006), and Carsrud et al. (2007) unearthed an unusual finding.

While perceived desirability and perceived feasibility were significant antecedents of intentions, as expected, a rudimentary test found that desirability and intent also clearly predicted feasibility, while feasibility and intent also clearly predicted desirability. In fact, the data from their studies seemed to suggest that feasibility may prove—statistically—to be the dependent variable. In their research, when the intent was the dependent variable, $R^2=.462$ and was driven by desirability (beta=0.547) and feasibility (beta=0.217). When desirability was the dependent variable $R^2=.464$ and was driven by feasibility (beta=0.222) and intent (beta=0.545). When feasibility was the dependent variable, $R^2=.284$ and driven by desirability (beta=0.297) and intent (beta=0.289). This would imply that feedback loops exist. Hence, we notice evidence for intention influencing its "predictors."

This finding indicates the intention process may not be linear. Considering that the theory of planned behavior and the entrepreneurial intentions model are linear, we face a serious contradiction (Carsrud et al. 2007). However, when looking at previous

attitude research (Kelman 1974; McBroom and Reed 1992; Allport 1935), it can be seen that this idea of reciprocal causation is not entirely new. Kelman (1974) claimed that attitudes cause behavior and that behavior causes attitudes (i.e., reciprocal causation exists) and McBroom and Reed (1992) suggested that the two are unrelated or that the two are caused by another third factor. Moreover, Allport (1935) argued that behavior may be predicted by triumvirate of “intention”-like constructs: cognitive, affective, and conative (which very roughly correspond to feasibility, desirability, and the intent to act). Behavior is likely to occur only when all three predictors are in place to some minimal degree. Empirically, this troika tends to be strongly inter-correlated. Given these earlier findings, it is reasonable to assume reciprocal causation within entrepreneurial intentionality as well (Carsrud et al. 2007). Consequently, it is time to explore whether the basic structure of the model really holds.

6.5 A Revised Entrepreneurial Intentions Model

In line with the findings from the work of Carsrud et al. (2007), the study of entrepreneurial intentions can be understood only in a theoretical framework where motivation, goals, and opportunity evaluation are included. The entrepreneurial intentions model (Krueger 1993, 2000; Krueger and Carsrud 1993; Krueger and Brazeal 1994) does not include any of these and is therefore a limited framework. However, this model does not explicitly include motivation. This lack of attention to motivation in entrepreneurship research also is pointed out in Chap. 13. Drawing on the elements of the existing models and on the findings from Elfving (2008), a theoretical framework for understanding how entrepreneurial intentions emerge is presented in Fig. 6.2. Elfving (2008) in her qualitative study was not able to determine the variable connections as precisely as in a quantitative study, nor is it possible to say how strong the connections are. This model therefore is to be considered a conceptual framework that still needs to be tested. Nevertheless, this kind of a conceptual framework is necessary in order for research to progress.

The research questions in Elfving (2008) focused on: *What are the characteristics of an entrepreneurial intention? How does an entrepreneurial intention emerge?* The results of that study are summarized in the context-specific entrepreneurial intentions model (context-specific EIM), graphically represented below. From a critical realist point of view, the EIM model illustrates the structure of the entrepreneurial intention formation process. This structure possesses the power to cause entrepreneurial behavior and is therefore helpful when seeking to understand entrepreneurial behavior. However, the role of social norms remains an elusive one as it clearly impacts the model, but it may in fact be an indirect one via motivation, goals, desirability, and self-efficacy. Additional discussion on motivation and goals can be found in Chap. 13.

The variables in the model in Fig. 6.2 represent the mechanisms that constitute the structure of an entrepreneurial intention formation process. The structure of an entrepreneurial intention deeply affects entrepreneurial behavior, but the impact is mediated through entrepreneurial goals and therefore entrepreneurial goals are

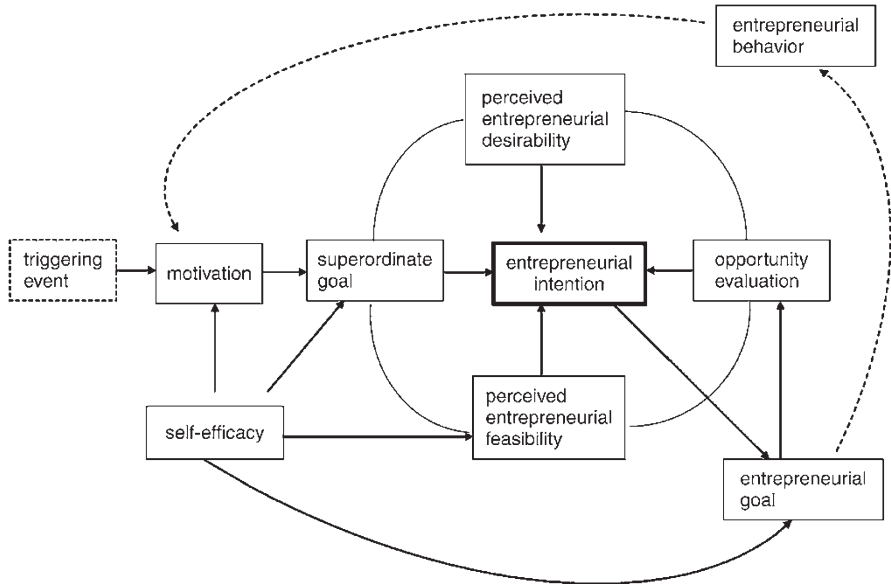


Fig. 6.2 The context-specific entrepreneurial intentions mode

important if one wants to understand entrepreneurial behavior. The existence of different kinds of goals, in this case, superordinate goals and entrepreneurial goals, also reflects the hierarchy of goals introduced by Bagozzi and Dholakia (1999). Entrepreneurial goals can be either focal goals or subordinate goals. However, the transition from entrepreneurial goals to entrepreneurial action is likely to be affected by non-volitional variables. This model stops at the level of intentions and does not take a stand on when or how an intention is transferred into action, although they are implied. Even in the Panel Study of Entrepreneurial Dynamics (PSED) by Gartner et al. (2004), there remains a group of entrepreneurs who intend to start something after a prolonged period, even if they have yet to really start a venture. Even if somebody has a strong intention to do something, something might prevent the person from pursuing the plan (Gollwitzer and Brandstätter 1997). This might include not taking enough actions to make a decision to either quit or start a venture. The impact of barriers and volitional versus non-volitional behavior occurs after the intention has emerged and is outside the scope of this chapter.

Entrepreneurial intentions are first and foremost a result of superordinate goals, perceived entrepreneurial desirability, perceived entrepreneurial feasibility, and opportunity evaluation. In the context-specific EIM, these variables constitute a circle around the entrepreneurial intention. The variables in the circle reciprocally impact each other. The results from Elfving (2008) indicated that superordinate goals affect both perception of entrepreneurial desirability and perception of entrepreneurial feasibility. If the main goal is to gain independence, entrepreneurial feasibility and entrepreneurial desirability will be evaluated in relation to how much independence it can provide.

The superordinate goal also impacts opportunity evaluation. The case studies showed motivation and superordinate goals affect what kinds of opportunities the entrepreneurs recognize. Moreover, the results from Elfving (2008) support earlier research findings that desirability and feasibility reciprocally impact each other (Brännback et al. 2006b; Carsrud et al. 2007). It seems that feasibility and desirability are always closely linked: high feasibility increases desirability and vice versa.

Opportunity evaluation is not included in the entrepreneurial intentions model developed by Krueger and his colleagues. (Krueger 1993, 2000; Krueger and Carsrud 1993; Krueger and Brazeal 1994). However, Kaish and Gilad (1991), Shane and Venkataraman (2000), Eckhardt and Shane (2003), Gustafsson (2006), and Elfving (2008) support the importance of opportunities and opportunity recognition in the intentional process. The variable opportunity evaluation in the context-specific EIM also includes a tendency to be optimistic and use self-serving biases. The optimism and the self-serving biases result in the entrepreneurs not perceiving themselves as taking risks. This finding is also supported by previous research (Shaver and Scott 1991; Palich and Bagby 1995) and consequently is not necessary to include perception of risk as a separate variable.

As Ajzen and Fishbein (2005) point out there is a difference between general attitudes toward a phenomenon and attitudes toward performing a specific behavior: the latter being more likely to result in action. One certainly hopes this is the case in entrepreneurship. The results in Elfving (2008) show perceived entrepreneurial feasibility and perceived entrepreneurial desirability impact *general attitudes toward entrepreneurship*. By also including superordinate goals and opportunity evaluation the behavior is tied to a context and this makes it possible to explore the person's *attitude toward performing a particular entrepreneurial activity*.

If an individual perceives entrepreneurship as feasible and desirable (i.e., in general holds a positive attitude), considers entrepreneurship to be in line with his overall goals in life and additionally sees an opportunity to perform an entrepreneurial act (the two latter constituting a positive attitude toward performing an entrepreneurial activity), then he is likely to form an entrepreneurial intention. The ability to predict attitudes toward a particular entrepreneurial activity, and not only a general attitude toward entrepreneurship, makes the context-specific EIM more precise than the original entrepreneurial intentions model.

Even if self-efficacy and motivation do not impact the formation of an entrepreneurial intention directly, the indirect impact is of such importance that it legitimizes including them in the model. Motivation is discussed in-depth in Chap. 13. Motivation is important because it determines what kind of superordinate goals a person sets in life. The superordinate goals are always set in relation to what is perceived as motivating. Self-efficacy is important because if motivation determines what a person *wants* to do, self-efficacy determines what he thinks he *can* do. Self-efficacy impacts both superordinate goals and entrepreneurial goals. Once again the reader is referred to Chap. 19. However, it is important to remember that self-efficacy is context and content specific (Bandura 1986, 1989) and both kinds of goals are likely to be impacted by different kinds of self-efficacy. Self-efficacy impacts motivation mainly through commitment, which Bandura (1989) also finds

in his research. High self-efficacy improves commitment and thus makes the person more motivated to continue.

Reality consists of many different processes and different structures where one event causes another. The context-specific EIM shows an entrepreneurial intention can result in entrepreneurial goals, which in turn leads to entrepreneurial behavior. Once behavior emerges it may cause changes in motivation. These changes then function as a triggering event, which results in new entrepreneurial intentions. This is seen for example in the case of an individual whose first intention is to start a small business to provide a living for herself. Once she gets started her motivation may change and so will her intentions. She may have formed an intention to explore the possibilities for growth. The triggering mechanisms for these changes can also stem from another source, and in the model, this is illustrated in the variable triggering event. The term is borrowed from Shapero's research (1982).

Finally, the context-specific EIM does not include the variable social norms. That does not mean that social norms are not important or that they do not have an impact but because the results for social norms were mixed further investigation is required before they can be placed in the model with accuracy. It is clear that they belong, especially in various cultures, but exactly how they function is still unclear and requires studying non-American populations.

6.6 Conclusions

We have in this chapter proposed a different model of entrepreneurial intentions, EIM, that ties motivations and goals into the traditional model of intentions. By doing so we are trying to integrate the various cognitive elements of the entrepreneur into a more comprehensive model that will link intentions to behaviors.

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Chapter 7

Revisiting a Contextual Model of Entrepreneurial Intentions

Jennie Elfving, Malin Brännback, and Alan Carsrud

7.1 Introduction

This update on our original chapter on the contexts of intentions will focus on what additional work has been done on the topic since we wrote the original chapter in 2008–2008. Before we begin this update review it may be helpful to remind the reader of some assumptions we made in the original chapter and which focuses the efforts of this update. When writing the original chapter a primary purpose was to point out to researchers the need to constantly challenge, test, and develop the models we are using to study entrepreneurial concepts, especially intentions. The model proposed in the original chapter particularly addressed the role that goals and motivations play in intentionality and suggested that a better understanding of their role is essential for understanding entrepreneurial intentions and would concurrently help us see the whole picture and understand the role of context. Certainly we want to acknowledge that one cannot look at intentions in isolation from other cognitive aspects like motivation (which we address in another chapter update on that topic). We also want to be clear that we have not listed here every study done since 2009 on entrepreneurial intentions that had some mention of context. What we have done is to look at what we feel are studies which drive this discussion forward.

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When looking at what has happened in the research literature since we wrote the original chapter, we fortunately find we were timely in our observations on context. We have been several studies and literature reviews supporting the need for entrepreneurship researchers to pay more attention to the context in which intentions to start a firm exist (Welter 2011; Fayolle and Liñán 2014; Zahra et al. 2014; Shepherd et al. 2015). However, there are still many things remaining undiscovered and effects of context underestimated.

7.2 Yes, We Need to Pay Attention to Context

Since the original chapter (Elfving et al. 2009) in “*Understanding the Entrepreneurial Mind: Inside the Black Box*”, it has become even more evident that entrepreneurial action springs from the action of the individual (Shane 2012), but that action is specific contexts that enable or inhibit entrepreneurial actions and reveals opportunities to individuals (Welter 2011; Rehn et al. 2013; Griffiths et al. 2012; Fayolle and Liñán 2014). As with most fields of social science research, entrepreneurship research tends to be quite dualistic, even if in reality things are not always so “black and white.” For example, we frequently strive to make a clear distinction between first and foremost entrepreneurs and nonentrepreneurs. In the same way, we separate necessity-based entrepreneurship from opportunity entrepreneurship or commercial entrepreneurship from social entrepreneurship. This kind of dualism is seen also in the methodological approaches, where we often make a distinction between agency and structure. This dualism is further on reflected in the gap between positivism and social constructionism research traditions (Oswald Jones 2015). Yet while this may be a great teaching tool, it frankly often hides the complex reality of the phenomena we are studying. Ten years ago Venkataraman and Sarasvathy (2005) argued that entrepreneurship researchers have paid too much attention to the agency, at the expense of the structure and the institutional environment. They use a metaphor of Romeo and Juliet to illustrate the linkage between an agency (Romeo) and the structure (the balcony) and claim entrepreneurship is “*all Romeo and no balcony*” (Venkataraman and Sarasvathy 2005, p. 652). To this we would perhaps add, one forgets that Juliet (the other agency) had her intentions as well which says that collective intentions are a part of the process as well (Bagozzi 2000).

As one of our colleagues as pointed out, studying entrepreneurship is about studying how, when, where, and by whom opportunities are discovered, evaluated, and exploited (Shepherd et al. 2015). The discussion on about the need for a better understanding of the structure and a contextualized model has been taken further by others, most specifically Welter (2011). She rightly claims that we as researchers have a tendency to focus a lot on *why* entrepreneurship happens, but a lot less on *when* and *how* it happens. Context is sometimes included as a variable (discrete context), but very few researchers have chosen a context lens (omnibus context). This means that in studies where context is taken into account, researchers mostly focus on a single context, such as, for example, social norms, gender, or a certain geographical area. Yet each of these contextual variables is impacted by a variety of

other contexts. We are in need of a multicontext perspective, because different contexts are intertwined. For example, Welter (2011) points out that if we want to understand entrepreneurial behavior, we need to consider historical, temporal, institutional, spatial, and social contexts. We personally believe this means more than just some generalized concept of social norms. Who makes up the members of the social group and the context for their impact is important. The social norms of parents may be very different than the social norms for one's college age peers and the impact on intentions most likely will be very different.

We also agree with Welter (2011) who also makes an important difference between contextualizing theory and theorizing context. Until now researchers have mainly focused on contextualizing theory, resulting in more knowledge about how entrepreneurs impact their context. However, we lack theories about how the broader context impacts entrepreneurial behavior (Welter 2011). There are recursive links between entrepreneurship and context, i.e., they are interdependent, and that is what makes it even more complicated. According to Welter (2011) there is a predominant and hidden assumption that entrepreneurship research would benefit from an overarching theory or method. But that is not a good solution when developing a theory of context. Instead of an overarching theory, we need an interdisciplinary perspective. But even here we need to be careful to not just blindly take theories and approaches from other disciplines without a complete understanding of the contexts of those theories (McMullan and Kenworthy 2015). We need an understanding of what context is, why it is important, and how it can be incorporated into research models. Entrepreneurship itself is a context and when applying theories to it or research approaches one must be cognizant of that specific context.

7.3 Nothing Happens Without an Individual

Shane and Venkataraman (2000) published an article proclaiming that entrepreneurship should be understood as a nexus between individuals and opportunities. This article has deeply impacted the field and brought about new and useful information with regards to opportunity recognition. In a more recent publication, Shane (2012) emphasizes that entrepreneurship requires both agency (a person who does something) and a context (an opportunity to do something) and it all happens in a process. This is also acknowledged by Shepherd et al. (2015) who illustrate that entrepreneurial activities are pursued in the interface between the decision maker and the environment. In line with Oswald Jones (2015), Venkataraman and Sarasvathy (2005) note that researchers tend to overestimate the importance of the individual and most pay less attention to the context in which that individual behaves. Shane (2012) concludes that after fifteen years our understanding of how context influences identification and exploitation of opportunities continues to be sparse. We believe this is also true when it comes to entrepreneurial intentions. We know little about why there are more opportunities in some places or at some point in time than at others. We also know that the intention to start a business seems to vary widely from place to place, even when one would expect similar levels of

intentionality given certain economic conditions. Clearly context is a complex phenomenon not simply defined as a social norm or economic variable.

7.4 Intentions and Opportunity

Shane (2012) defines opportunities as “*situations in which it is possible to recombine resources in a way that generates a profit*” (p. 15). From this definition it can be derived that opportunities may accrue when the situation, i.e., the context, changes. Contextual changes such as scientific advance, demographic and social changes, as well as political and regulatory changes are likely to create entrepreneurial opportunities (Shane 2012). How such opportunities impact entrepreneurial intentions is as yet unclear. For example, does intention drive the search for opportunities or do opportunities drive intentions to start a firm? While contextual changes and their impact on entrepreneurial behavior have been studied, we concur with Welter (2011) conclusion we still lack theories that could provide as with a more generalized understanding of the phenomena. Likewise, we remain woefully bereft of theories to help us understand the role of context in entrepreneurial cognitions, in particular, intentions. Simply plugging in a variable called “social norms” is insufficient.

While this is not a review of opportunity recognition literature, the intention to start a new venture is clearly tied to opportunity recognition at some point. You have to intend to start something. There is still an ongoing debate about whether opportunities exist in an objective fashion or if they are rather created, i.e., they arise as a process of collective sense making. The positivist/realist position claims opportunities are *found*, whereas the social constructionist position seen them as *made* (Suddaby et al. 2015; Venkataraman et al. 2012). Venkataraman and his colleagues (2012) highlight the role of collective interaction and shared experience in shaping and reshaping opportunities. This collective view of intentions is seen by some as “we intentions” (Bagozzi 2000). Drawing on this Venkataraman and colleague suggest developing a nexus around actions and interactions. From this point of view opportunities can be found as well as made. The important thing is the interaction between the entrepreneur, the entrepreneurial team, and the external environment, which result in new ventures and new markets.

7.5 Being Motivated, Seeing Opportunities, and Time

In another chapter in the original book, Carsrud et al. (2009) provided an overview on the role motivations play a central role in entrepreneurial behavior. This area has also been explored by Carsrud and Brännback (2011) and Shane et al. (2003). Entrepreneurial intentions do not always lead directly to entrepreneurial behavior and we are beginning to understand that motivations can either shorten or prolong this action (Carsrud and Brännback 2011; Shepherd et al. 2015). Some recent cross

national research done by the authors shows no direct impact of multidimensional achievement motivation on intentions. However, it may be that motivation impacts opportunity recognition and actual behaviors of starting and running a venture. But as Shepherd et al. (2015) point out, a static perspective largely ignores the possibility that the entrepreneur's decision policies and motivations can change over time. Therefore, future contributions are likely to come from research that explores the role of time and how it affects various aspects of entrepreneurial decision making. Clearly time is a context that needs to be explored more fully beyond longitudinal studies like the PSED.

Another important aspect is that when we talk about intentions is to know exactly what we mean by "intentions." According to Fayolle and Liñán (2014) researchers seldom define or explain what they refer to when talking about entrepreneurial intentions. In the same paper, Fayolle and Liñán (2014) suggest that linking intentions theory to prospect theory, effectual theory and commitment theories might help developing the field of research. This also brings us to motivational theories and goal theories. And in the light of more recent research, it seems we have not, to a sufficient extent, acknowledged results from previous motivational research, which show that there is a difference between goal intention and implementation intention (Gollwitzer and Brandstätter 1997). A goal intention can be, for example, "I intend to become an entrepreneur." An implementation intention is more specific and can be, for example, "I intend to become an entrepreneur once I have finished my studies." An implantation intention includes a stronger commitment to perform a specific behavior and is therefore more likely to result in action (Carsrud and Brännback 2011). It appears that if we shift to examining the motivation–opportunity perception nexus it could be more rewarding than studying the individual–opportunity nexus as suggested by Shane and Venkataraman (2000). A deeper understanding of the motivation–opportunity nexus might help us understand the missing link between entrepreneurial intention and entrepreneurial action and also allow us to include the time dimension and changes occurring as a result of contextual changes.

7.6 Moving Forward

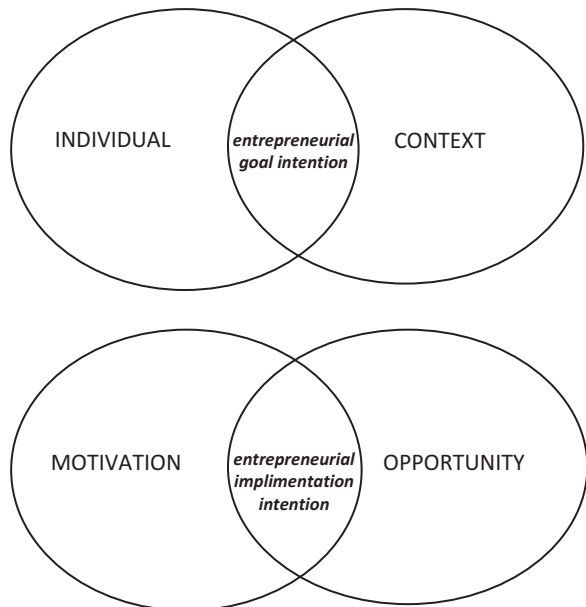
The context-specific entrepreneurial intentions model presented in the previous edition was an attempt to reveal some of the various shortcomings in the classic entrepreneurial intentions model developed initially by Krueger (Krueger 1993; Krueger and Brazeal 1994; Krueger et al. 2000). As such the context-specific model we presented is somewhat insufficient and difficult to test. Recent research (Welter 2011; Rehn et al. 2013; Griffiths et al. 2012), however, has shown the need for a more context-sensitive model and also verified that motivation and goals play an important role in understand intentions. Therefore, it is worthwhile to further advance the main ideas of a context model of intentions. Considering what has been said previously in this paper, we support the claim that contemporary research crystallizes four main components of entrepreneurial intentions: *an individual, a context, an opportunity,*

and a motivation. In addition to this, we have clarified the importance of separating between goal intention and implementation intention, i.e., a more general entrepreneurial intention versus an intention to implement entrepreneurship within a foreseeable time span. This may explain why we have yet to find a direct connection of achievement motivation of a generalized intention to start a firm.

Entrepreneurial action is derived from the motivation of the individual as well as on the opportunities perceived by the individual. Motivation and perception of opportunities are likely to have a reciprocal connection. Sometimes a high motivation can enhance opportunity recognition and sometimes a good opportunity can strengthen the motivation. Likewise both motivation and perceived opportunities are likely to be influenced by both individual aspects and contextual aspects, including previously studied variables such as perceived feasibility, perceived desirability, and social norms. Person-specific factors such as attitude toward entrepreneurship, self-efficacy, and goals will impact motivation and perception of opportunities. But also historical, temporal, institutional, spatial, and social contexts will impact the intentions of the individual (Welter 2011). Further on the environment will impact the individual and the individual will impact the environment and therefore there is a reciprocal connection also here. We are currently engaged in studying some of these connections within the context of international samples of students using scales currently found in the literature.

In summary, what we are saying is that the individual–opportunity nexus presented by Shane and Venkataraman (2000) is not the exact answer to studying the context of entrepreneurial intentions. Based on what the most recent research, we suggest we should be studying two different nexuses: one that results in an entrepreneurial goal intention and a second that results in an entrepreneurial implementation

Fig. 7.1 The individual–context nexus and motivation–opportunity nexus



intention. We suggest the entrepreneurial goal intention has its roots in the individual–context nexus whereas the implementation intention has its roots in the motivation–opportunity nexus. This suggestion is in line with the previously presented context-specific entrepreneurial intentions model, but much simplified and therefore also easier to implement and test. This version is illustrated in Fig. 7.1.

As shown in the earlier model, the individual should never be excluded. Entrepreneurial action will always imply an actor. Therefore, we cannot ignore the individual when theorizing context. Likewise the actor is never acting in a vacuum and therefore the context has to be included in the model as well. Using the metaphor introduced by Venkataraman and Sarasvathy (2005), we should not jump from focusing exclusively on Romeo to focusing exclusively on the balcony. Both are needed in order to make the plot understandable. However, Romeo without Juliet on balcony likewise would not be a romance. Here is where “we intentions” becomes a part of the context. An entrepreneurial intention is an interlinkage between person and context, i.e., agency and structure. Further on, it is important to note that a goal intention does not automatically lead to an implementation intention. However, it is fair to assume that a goal intention precedes an implementation intention and therefore both stages are central, but the important thing is to know what kind of entrepreneurial intention we mean when we talk about entrepreneurial intentions.

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Chapter 8

Context and Entrepreneurial Cognition

Simone Chlosta and Friederike Welter

8.1 How Do *You* Perceive Context? The Researcher's Perspective

That was the pivotal question we asked entrepreneurship researchers in a recent workshop about the future of entrepreneurship (research). Interestingly, it seemed to be a difficult question as many participants realized that their attempts to explain context fell short. Some examples were “silicon valley context,” “social context,” “business context,” and also “age and experience of the entrepreneur” or, more to the theme of this book: “context influences how we see the world” and “context is something internal.”

We realized that all of us had an idea of context, however vague, but that our perceptions on what constitutes context differed heavily: from very detailed to rather vague assumptions. All descriptions illustrated that context was perceived as a “complex thing,” a cognitive construct, something which is highly subjective and varies from person to person. Our discussion also showed that context is seen as something outside of us (e.g., the country context) and at the same time inside of us, referring to the experiences we made in our country, but also the interpretation we put to these experiences—the making sense of context. We realized that context affects the person but also each person is capable of affecting and changing their contexts. In our discussion, we came to realize that as entrepreneurship researchers, we usually take an actor-based view focusing on the entrepreneur or the venture. In our research designs, context, too often, still is treated as “something outside the phenomenon,” as a control variable, and it is not the lens we use to understand entrepreneurship.

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But how realistic is such a “context-free view”? Even, when researchers focus on the actor, doesn’t it make sense to pay attention to the context which surrounds the entrepreneur? Take a painting: what is a foreground *without* a background? Maybe we need a more systemic and intersectional approach that builds on a variety of disciplines covering different foci (actor and context) plus various aspects of “inside and outside” contexts, thus recognizing the multiplicity and complexity of contexts in entrepreneurship. Not until we acknowledge that foreground and background are intertwined, that contexts and entrepreneur influence each other and that contexts are inside and outside of the entrepreneur, we will realize that cognition seems to be the glue which connects both views: the actor-based and context-based view. These are some of the ideas we will explore further in this chapter which we see as our experimental thinking ground to connect context to the cognition research.

8.2 Context from the Perspective of Entrepreneurship Research

For a long time, entrepreneurship research was biased toward one-level studies, with context seen as something that exists as stimuli in an environment external to the person and at a different level of analysis (Mowday and Sutton 1993), hence can be treated as control variable. One justification *against* contextualization has been the ongoing trend toward the generalization of findings (Bamberger 2008) which appears to supersede the appreciation of contextualization means to acknowledge differences and variations instead of the search for general patterns applicable to all entrepreneurs. But what feeds this longing for generalizing instead of contextualizing our research? Don’t we all want to be treated like individuals? How can we think that entrepreneurs within their individual contexts are alike? Elsewhere, we have suggested that contextualization will make our research results much more relevant for practitioners and policy-makers (Baker and Welter 2015; Welter et al. 2016). Contextualizing means acknowledging differences, a shift in our perspective which Gartner already suggested in 1985 (p. 704) “away from viewing entrepreneurs and their ventures as an unvarying, homogeneous population, and towards a recognition and appreciation of the complexity and variation.” Our longing for similarities has created a trend in entrepreneurship research to treat all entrepreneurs alike which did not work for the trait approach in entrepreneurship as we all (should) know since Bill Gartner published his article “Who is an Entrepreneur? Is the Wrong Question” in 1988.

Today’s understanding of context is much more focused on a holistic picture of entrepreneurship within its contexts and of entrepreneurship as simultaneously influenced by contexts and changing those (Welter 2011). Entrepreneurship scholars have accepted the need to contextualize (e.g., Chalmers and Shaw (2015), De Bruin and Lewis (2015), Gartner and Welter (2016), Welter (2011), Welter and Xheneti (2013), Zahra and Wright (2011), Zahra et al. (2014)). Among others, Zahra and Wright (2011) called for a substantive shift in entrepreneurship research, regarding our focus, our content, and our methods because of “the obstacles to discovery—the illusions of knowledge” (Boorstin 1983, p. xv). And, if we miss this

shift in entrepreneurship research, “we, as a community of entrepreneurship scholars, become the antipathy of what we study” (Shepherd 2015, p. 503). One step forward would be the usage of richer indicators of entrepreneurial activities, for example, by examining heterogeneous aspects of context and applying “an intimate link between process and context” (Zahra and Wright 2011, p. 67). They argue for reframing the field in a big way and “not simply relying on incremental research filling known research gaps and voids” (Zahra and Wright 2011, p. 68).

But most studies still focus on conceptual issues. There is a lack of empirical studies that provide a more comprehensive and holistic view of contexts and that push the contextualization of entrepreneurship beyond using context as mere descriptions and/or mere controls. Spedale and Watson (2013) criticize that context is too often seen as “merely background” (p. 4) within our studies. Where scholars contextualize, they often simply add a section that describes the research settings and surroundings (the “context”) of the sample.

Contextualizing our (empirical) research resembles nothing less than a cognitive shift in our work: a change in the way we (researchers, authors, editors, reviewers) do our work, think about our work, and interpret our work (Bamberger 2008). We need to better understand contextual contingencies interacting with and mediating or being affected by the entrepreneur and the venture. And we need to understand the meaning which is attached to entrepreneurial phenomena varying across situations, times, and social units. However, this approach can be risky for researchers if editors and reviewers are not aware of the need to contextualize, instead rejecting articles which are not consistent with the familiar paths of the field. Also, at least in the short term, this shift in how we perceive entrepreneurship will definitely complicate our understanding of entrepreneurial phenomena (Spedale and Watson 2013). The authors demonstrate how, by contextualizing, we can move “beyond the artificial separation of ‘context’ and ‘individual’” and instead arrive at a more realistic picture of entrepreneurial actions. Entrepreneurship *is* messy and complex; and context-rich research can assist us in making sense of the real world of entrepreneurs.

So, what’s next? From our own research, we know that we are most likely to recognize the importance of contexts by going outside of our own, familiar context (Welter 2016). In this regard, we believe that we can learn much from opening up for different disciplines, discussing entrepreneurship topics with psychologists, economists, and sociologists. And the role of cognitions for contextualized (empirical) entrepreneurship research is definitely worth looking at, given the growing awareness that contextualization is about acknowledging variations and differences in entrepreneurship (Welter 2016). Before turning to reviewing the perspective of context from cognition research, we will have a closer look at what entrepreneurs themselves think about context.

8.3 Context from the Perspective of the Entrepreneur

“Contexts matter”—while entrepreneurship research has embraced this by now, the question remains as to how do entrepreneurs themselves perceive context. Does it matter for them? And if so, which contexts are important? We believe this change

of perspective is important to see similarities and differences between researchers' and practitioners' view, as research focused on business growth has illustrated (Achtenhagen et al. 2010).

Wanner (2014) set out to ask entrepreneurs how they define and perceive context—and she quickly came to realize that entrepreneurs had enormous difficulties to precisely define context. Interestingly, the majority of entrepreneurs she interviewed described context in some detail, often relating it to images from farming or other metaphors, but overall they remained fuzzy in their definition: “Context is like the soil which makes the seed grow.” They also saw context as an underlying motivation influencing the actions and reactions of a person. While the number and diversity of context dimensions differed, all entrepreneurs agreed that context is the interplay of external factors which influence the actor. Also, they emphasized relations as one constitute element of context, as one entrepreneur elaborated: “Context is the result of various personal encounters because each encounter has an effect on me and forms my individual context.”

Entrepreneurs specified a multitude of contexts: from their individual and social contexts (private, family, friends, networks); their venture and business context (the venture itself, operational, employee, customer, market, business partner, mentor, persons of trust); the region and place, also reflected in infrastructure; and the wider institutional context (framework, values). Not surprisingly, the venture-specific context mattered most for entrepreneurs, followed by the private and social context. Interestingly, entrepreneurs did not perceive contexts as something which is fixed for eternity, but rather as something changeable, which depends on their individual life and working circumstances as well as the life cycle of their company. In other words: for them, contexts are fluid, dependent on their personal and business circumstances, and constantly “on the move,” which points to the dynamics of contexts in entrepreneurship.

Additionally, context was also perceived as something more tangible, in the form of a scale for assessment and attribution. “Context is like a mirror; it helps me to evaluate, for example, whether or not I am successful.” Entrepreneurs saw context as an important influence on their decision-making as explained by this entrepreneur: “Context are all factors which I draw upon when making a decision or taking action.” This also included the emotions which are linked to certain situations, for example, disappointment as employee can be a motivation to become an entrepreneur and never move back to paid employment again. Finally, entrepreneurs pointed to context as something fluid and fuzzy: “Context is nothing concrete but rather atmospheric; it is like a framework, e.g. being a student in a university framework is accompanied by certain opportunities and restrictions.”

To sum up: for entrepreneurs context is not static, but dynamic. It is out there, as a real, tangible, and spatial framework like the household context or occupational context. It is also something “atmospheric,” originating from themselves and their experiences; it depends on and is influenced by social relations. Interpretation or sense-making has a lot to do with their definition of what constitutes context. Contexts matter and that to a large extent—and entrepreneurs have no difficulties

voicing the “implicit” aspects of contexts—contexts, in their understanding, are part of what makes them entrepreneurial and of their entrepreneurial identity. Interestingly, current research on contexts and entrepreneurship has come to recognize the need to better research the multifaceted nature of context as expressed by entrepreneurs themselves (see the chapters in Gartner and Welter 2016). Next, we turn to the lens of cognition research in order to identify further insights for our model of contextual research.

8.4 Context from the Perspective of Cognition Research

Cognition research originally stems from the field of psychology. It covers our mental processes like human attention, learning, memory, or perception. The study subject is the individual, and research focuses on the microlevel of research, trying to understand interindividual differences as well as identifying general principles of human cognition and behavior. Context features prominently in psychological research, as the individual context is seen as a possible explanation for certain behaviors. For example, in Jean Piaget’s theory of cognitive development (1955), the individual is seen as an active being who is in a constant exchange process with the world around her/him.

Similar to Piaget’s cognitive theory, many theories and models in psychology that focus on the person always consider the person *within* a context. Therefore, context is included when trying to understand certain behaviors. One prominent example is the so-called person-situation models such as in personality-fit theory (Chatman 1989) or trait activation theory (Tett and Burnett 2003) which were successfully applied to job performance research. “Trait and situation form two sides of the same coin that cannot be separated from each other” (Eysenck and Eysenck 1985, p. 39). Other more general models like the social cognitive theory (Bandura 2001), which features prominently in entrepreneurship research, not only include different levels, here the micro and macro level, but also incorporate a reciprocal determinism. Bandura’s theory builds a triadic model with three interacting elements: personal factors (cognitive, affective, and biological), environmental factors (social, physical environment, and its perception), and behavior. These three factors are constantly influencing each other, thus showing a dynamic interaction. In other words, behavioral change depends on the interactions between the environment, people, and their actions.

Thus, behavior is not simply the result of the environment influencing the person, just as the environment is not simply the result of the person and individual behavior (Glanz et al. 2002). Compared to many entrepreneurship theories, person-situation models have a huge advantage, because they already incorporate the context into the person. Thus, they see context as both external and internal and refrain from introducing an artificial dichotomy between person and context or micro vs. macro levels. Not surprising perhaps, entrepreneurship research had to rediscover “context,” while psychology never denied the existence of context.

How can we integrate this perspective into our model of contextual entrepreneurship? When we examine our study subject, the entrepreneur, together with the contexts, we might ask ourselves why some entrepreneurs see an opportunity and others don't. Again, we experience an interaction between context (the opportunity) and cognition (paying attention to the opportunity, thinking of this stimulus as an opportunity). For example, research in former Soviet countries illustrates how entrepreneurs navigated an unfamiliar institutional context, identifying the so-called institutional holes as entrepreneurial opportunities, which was made possible because they could draw on their knowledge from Soviet times as to how to circumvent state regulations (Welter and Smallbone 2011).

Another example is how we examine whether an entrepreneur is successful. In most entrepreneurship studies, the researcher is the one who decides how success is defined, usually in monetary terms measured through revenues, sales, or employment growth, and not as individual goal attainment or satisfaction, observable through the wish to become independent or to have a higher job satisfaction. But how can we measure success without asking entrepreneurs about their goals? Why do we assume that business success is separate from individual success or that individual goals do not matter for business success? And, again, it is differences that matter. Differences in contexts and in cognitions and the interactions between contexts and cognitions influence how entrepreneurs see and perceive success.

Therefore, a contextual model of entrepreneurship has much to gain from including the perceptions and sense-making of entrepreneurs, i.e., a cognitive perspective. It is important that we listen to entrepreneurs and ask about their view of their entrepreneurial reality instead of remaining in our well-known, comfortable research context and continue imposing our context on others. We have to realize that we as entrepreneurship researchers are insiders regarding our own individual context but outsiders when it comes to others. Therefore, we suggest that we need to treat context as something personally which gives meaning to what we perceive from the outside. Next, we turn to putting the different perspectives together.

8.5 A Step Forward: Cognitions as Glue Between Context and the Entrepreneur

By means of their cognitive abilities, individuals, in this case entrepreneurs, pay attention to the world around them, listen to others, perceive what they are doing, learn from important role models, and use these mental processes for decision-making with limited information and under substantial uncertainty along their entrepreneurial journey. While these cognitive processes proceed, the world around them (aka context) is no longer merely external to them but has entered their cognitive system and thus became a part of the entrepreneurs themselves. From this follows that context can be both exogenous and endogenous at the same time but never separated from the entrepreneur.

Contexts and cognition interact; therefore context is definitely not the same for all entrepreneurs. For the same reason, not all entrepreneurs are alike. The environment for a business, for example, the regulations and laws governing business entry and business exit, can be the same. But the ways entrepreneurs deal with these laws can differ according to their social learning or individual experiences. Oftentimes, governments introduce lighter regulations for micro businesses, in order to level the playing field with regard to bureaucracy and compliance costs which more heavily fall on smaller firms. However, whether entrepreneurs in such micro firms really perceive bureaucracy as a burden depends on their individual experiences and interpretations of the regulations and rules they face. In other words, their institutional context is both objective and subjective at the same time, resulting from individual interpretations of what happens around us.

It is here that entrepreneurship cognition research can offer us some guidance in how to contextualize in practice. In the 1990s, the study of interindividual differences of entrepreneurs resurged focusing on cognitive approaches (Busenitz and Arthurs 2007). Baron (1998) demonstrated that our mental structures influence how we perceive the world and whether we recognize opportunities for a new venture or not. It has also an effect on whether we perceive the creation of a venture as a risky undertaking or not. These studies of interindividual differences of entrepreneurs show how to handle context, namely, by treating it as a cognitive product which is *not* objective, but individual and relative to their experiences and mental models. This again reveals the interaction between context and entrepreneurial cognition.

We, as entrepreneurship researchers, also have to admit that we are not “context-free” and that we conduct research within our own context, which influences (or biases) how we perceive the entrepreneurial world. However, when we step outside of our box (comfort zone) and treat this bias as an opportunity, we might be able to advance the contextualization of entrepreneurship research. Why not start collecting different, seemingly “biased” context perspectives? Why not refrain from our human want to simplify matters by immediately establishing a universal model to explain entrepreneurship? Instead, we can try a “learning model” of context which is able to adapt to new circumstances, relationships, and perspectives. And we can start that with the entrepreneur’s perception of context.

As entrepreneurship researchers, we use our cognitive abilities to simplify the world in our models, but we should not forget that the entrepreneurial reality is much more complex and messy. When reading entrepreneurship articles, someone not familiar with our research assumptions and designs may come away with the impression that we believe our modeled and simplified world to be the real one. For example, in a typical entrepreneurship study, our independent variables explain around 25% of the variance, leaving a 75% error variance due to control variables like context (Brännback and Carsrud 2016). We suggest that by incorporating contexts, we can explain more of the variance.

In order to shift toward contextualized research, we can learn from our study subjects, the entrepreneurs, who constantly adapt or change contexts. As Sir William Lawrence Bragg puts it: “The important thing in science is not so much to obtain new facts as to discover new ways of thinking about them” (Koestler and Smithies

1958, p. 115). A new way of thinking or “thinking outside of the box” does not automatically mean that we have to fully banish our previous models and research designs but that we should use our own cognitive processes and dare to question and change models/research designs to better fit to the real entrepreneurial world.

This has implications for research methods and tools also (scales, constructs, etc.): Who created in which context with what kind of samples at what time the measures we have used for years in our research? Entrepreneurship is quite complex (multidimensional), varying, and usually unfolding over time. But many popular measures in entrepreneurship do not sufficiently consider the process perspective as variation over time of their study subjects. “Reading the literature, one can easily (but mistakenly) conclude that entrepreneurship is a one-time act that ends with the creation of a firm” (Zahra and Wright 2011, p. 70). For more realistic, contextualized methods in entrepreneurship, we need to be sensitive to the variation of our study subjects (Gartner 1985): integrate the perspective of entrepreneurs, of cognition research, and of person-situation models. This includes a need for replication studies, which results may differ once we start to incorporate context. We need to be open to conflicting findings as they probably mirror contextual influences. From this, it follows that we also would have to question our theories and underlying logics. Do they fit our field of study? Most (statistical) models assume causal relationships, whereas everyday entrepreneurship could not be further from causality.

8.6 Outlook

To sum up, context needs to become part of the story which goes far beyond introducing it as a “simple” control variable. This also asks for different research approaches. For example, we may learn much from interacting with our study subject and becoming engaged in the setting as Bengt Johannisson (2011) suggests with his enactive entrepreneurship research approach and his entrepreneuring approach. We need to tear down the existing boundaries and artificial dichotomies (e.g., micro vs. macro, individual vs. context) and be open to the nonlinear and reverse influences (e.g., bottom-up instead of top-down) caused by contextual factors. We need to use our own cognitions to become aware of the role cognitions play for contextualizing entrepreneurship research. We suggest that by paying attention to the interaction of cognition and contexts at each step of the research process, we can make our results more relevant to entrepreneurship scholars, practitioners, and those supporting entrepreneurs.

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Chapter 9

Cognitive Maps in Entrepreneurship: Researching Sense Making and Action

Malin Brännback and Alan Carsrud

9.1 Introduction

Isn't it quite fascinating that we with a few lines and symbols on a paper can "see" oceans and land, perceive borders between countries and distances between cities, re-live memories from vacations and start longing for friends in distant places. The map gives a world. This world determines how we interpret the world in front of us. At the same time we know at heart that the world does not at all look like this. We know it with certainty. Yet we use this map to orientate ourselves in the global room. It seems as if we cannot do anything else. But, the fact remains: *This is not the world!* The world is not flat. (Kristensson 2002, 18)¹

In his book Kristensson (2002) discusses our relationship to maps by asking us to take a really good look at the map shown in Fig. 9.1. He assumes most of us probably recognize it. "Most of us know it from our childhood. This is how we have been taught the way the world 'looks like' and when we have it in front of us we think we have a perspective of the world—the entire world. It is safe and stable...most of us can easily find Bangkok, Munich or Santiago de Chile." Kristensson Uggla then asks us to conduct an experiment, "...turn the map upside down and something suddenly occurs: It is no longer easy to find places! Try fast to find Bolivia, Bangladesh or Belgium." He asks if we found it difficult and concludes that we most probably did. "You can also try to turn it 90° to the left or the right and you are probably equally

¹ This quote is one of the author's translation from the book *Slaget om verkligheten* (Kristensson 2002; the title would translate as *The battle about reality*), which is currently available only in Swedish.

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Fig. 9.1 Traditional—Mercator’s—projection of the world (source: <http://www.progonos.com/furuti/MapProj/Normal/ProjNav/projNav.html> accessed February 11, 2009)

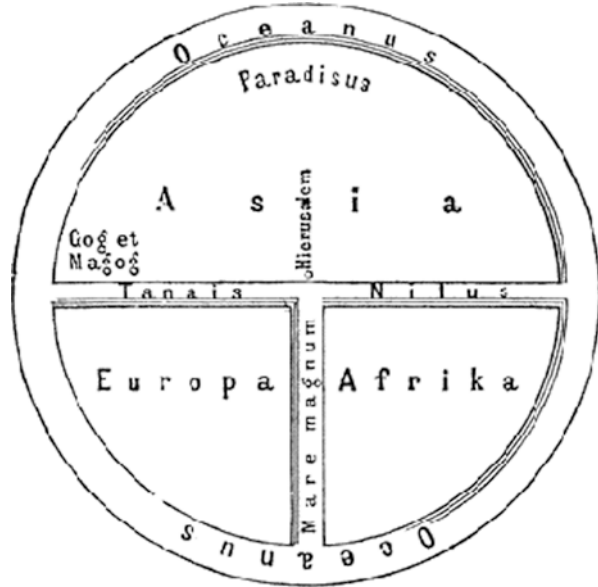
lost. Why? Because, we are used to the world ‘looking like’ it does when it is turned the right way up” (Kristensson 2002, 17–18).²

Take a look at Fig. 9.2—The TO-map—a world map from the sixteenth century. It depicts a world where Europe, Africa, and Asia are separated by the Danube (*Tanis*), the Nile, and the Mediterranean. This map was not used for navigating in the physical geography but for navigating in the spiritual geography. It is a map of the meaning of life, a religious map. How do we know that? Kristensson Uggla explains, the horizon is turned toward the east (*Oriens*), a “wrong” direction according to the modern world (which has for centuries been oriented towards the west (*Occidens*)). The TO-world was oriented toward the east because at the time it was thought that Paradise was in the east, but above all, that Christ would return from the east.

The world map shown in Fig. 9.1 as “the real” picture subsequently replaced the TO-map. Kristensson Uggla continues to ask (p. 27): How has this map (Fig. 9.1) organized our thinking of the world? Europe is in the middle, sided by America and Asia and above Africa, reflecting a kind of geopolitical power relationship.

²The translations are made by one of the authors.

Fig. 9.2 The TO-map, sometimes also known as the Beatine map (http://en.wikipedia.org/wiki/T_and_O_map accessed February 11, 2009)



Moreover, a two-dimensional projection of a three-dimensional globe portrays the proportions to the advantage of Europe. In this Mercator’s projection, the United Kingdom is the same size as India and does not reveal the actual fact that Asia and America are about four times larger than Europe, Africa is three times larger than Europe, and that Australia also is larger than Europe.

While a map is a representation of territory or a journey from one place to another and it also has the ability to represent the environment with varying degrees of detail. It is also a model or image capable of focusing minds, helping to understand and make sense, for taking particular courses of action (Cummings and Wilson 2003). The focus of this chapter is on the territories of minds, sense making, and action. While the geographical functionality of maps is important it is beyond the scope of this chapter. We focus here on the cognitive maps that entrepreneurs use to guide their creation of a new venture.

Maps of minds, sense making, and action are known as cognitive maps. Cognitive maps, which are some times called schemas or scripts, are concepts from the field of cognitive psychology that have been studied and used in organization theory and strategic management for several decades (see, for example, Bougon et al. 1977; Bougon 1992; Fiol and Huff 1992; Hodgkinson et al. 1999). Today managerial and organizational cognition is a well-establish research area (for a detailed review see Walsh 1995). However, cognitive maps are not only representation of individual perceptions. Cognitive maps, or cognitive mapping, are powerful research techniques to study exactly how people “see” things and how these sights differ and impact subsequent action. This chapter explores how cognitive maps, as perceived by the entrepreneurs and others, can be used in research on the entrepreneur and the entrepreneurial process. In Chap. 11, there is a detailed discussion on entrepreneurial scripts.

9.2 Cognitive Maps: Territory of Mind

Cognitive maps, within managerial and organizational cognition, have been described as sense-making tools that can be used to map out territories (cognitive or physical) and are the basis for action (Weick 1990). Maps emphasize spatial relatedness and are replacements for space. Maps communicate a sense of place, a sense of *here* in relation to *there*. Literally and figuratively maps put people into their places, e.g., the market (potential, served, actual, target), the competitive environment, the United States, the European Union, China, etc., or the industry (semi-conductors, biotechnology, or fast food). Maps establish a landscape or a domain (Huff and Jenkins 2002). Fiol and Huff (1992, 267) define cognitive maps as “...*graphic representation that locate people in relation to their information environments. Maps provide a frame of reference for what is known and believed. They highlight some information and fail to include other information, either because it is deemed less important, or because it is not known. They exhibit the reasoning behind purposeful actions.*”

In management research, it is often claimed that the theoretical foundation for cognitive maps is a psychological one: Personal Construct Theory, developed by Kelly (1955) (Eden 1988; Eden and Ackermann 1998). Cognitive maps are seen as personal construct systems. In developing the Personal Construct Theory, Kelly assumes the individual to be inherently curious about the surrounding reality. Kelly argues that a person is gradually making sense of his or her reality. Reality is seen as dynamic and that (p. 15) “...*all our interpretations of the universe are subject to revision or replacement.*” Kelly argues that experience is vital for sense making in that it functions as a constantly correcting compass of facts. Experience is seen as the extent of what we know although its validity can be disputed. The compass enables the creation of patterns that map on to the already known, in other words it takes a map to create a map. Maps are tools for finding *explanations*, for making sense by sometimes creating powerful narrative-like stories.

While experience is important, it does not guarantee the validity of personal constructs. That is, the constructs need not be accurate. Karl Weick (1990, 7) argues: “If cognitive maps are imperfect renderings of territory, and if people have had extensive experience with other territories in their lives, then present maps...create a composite virtual map that capitalizes on what the person already knows.” Experience prefigures our perceptions and at the same time underscores the subjective nature of cognitive maps. That is, we tend to see what we expect to see (Louis and Sutton 1991). Past experience builds on a top-down or a “theory-driven” conceptualization (Walsh 1995) of new information where experience affects an individual’s ability to encode and draw conclusions from the new. Put slightly differently: what is out of mind is out of sight or to quote the quote in Chap. 11 by Mitchell, Mitchell, and Mitchell—“Never Mind!” This in turn brings on the notion of explicitness and tacitness. The latter is especially challenging as we may not always be capable of explaining what we see (Polanyi 1967; Nonaka 1990). Yet, if the difference between the expected and the actual is large, experience becomes the compass of comprehension—of sense making. Cognitive maps therefore are forms of heuristics. Therefore,

it becomes vital to distinguish between relevant past experience, through selection, omission, and organization.

With respect to venture creation, when almost everything is new the challenge becomes to select among open-ended possibilities. Moreover, past experience may only be partially relevant. For example, past experience in the same industry may indeed be helpful. But if the past experience is anchored in the operations of a large, multi-national firm, it may not give much appropriate guidance for anyone about to create a small firm. This is because the individual's cognitive map lacks any experience in how to create a venture, or how to function in a small firm reality. Likewise, experience in one sector of high technology does not allow for generalizations across different sectors or industries within high technology (Brännback and Carsrud 2008).

If we re-write the basic thesis of Personal Construct Theory into an entrepreneurial context we would arrive at the following: “we presume the business world really exists and the entrepreneur is gradually coming to understand it. We assume that the entrepreneur's thought really exist, though the correspondence between what the entrepreneur thinks exists and what actually does exist is constantly changing.” Accordingly, we may argue that an entrepreneur needs to make sense of his/her reality to predict and to control—to find and to solve problems.

The concept of territory is a cognitive abstraction and symbolization of events and things, which through the use of *language* are expressed or represented for creating a mental map (Weick 1990). However, the way we create a map differs between individuals. That is, we end up having different cognitive maps. Hence although all entrepreneurs are not alike and all managers are not alike, thus managers and entrepreneurs will have different cognitive maps. Mapping occurs through selection, omission, and organization things and events into some seemingly coherent pattern.

While maps and territories are seen as distinct, this distinction is anything but clear in strategic thinking—and entrepreneurial thinking. Weick (1990) argues that the ability to distinguish between map and territory is a left-brain activity, while strategic thinking is considered a right-brain activity. Mintzberg (1976) argues that planning takes place in the left brain and the actual managing or implementation takes place in the right brain. With respect to strategic plans, Mintzberg speculates that this may be one of the reasons why so many plans failed. This line of reasoning could well explain why so many business plans fail—not just to get funded, but much more, fail to get effectively implemented. Maps are the territory and yet most of managerial activity is socially constructed, i.e., the map creates the territory. Thereby maps prefigure self-confirming perceptions and actions. Maps as such are passive, while managerial and entrepreneurial life rests on the notion of constant activity and motion.

Weick (1990) argues that maps on a sufficiently high level of abstraction lose their ability to provide a vehicle for identifying differences. Things and events start to look alike. Consequently, when firms engage in, for example, benchmarking in order to map or place the firm in the competitive landscape, this exercise becomes

fruitless or inaccurate if conducted on a too high level of abstraction. That said, Weick (1990) continues to observe that managerial maps need not be too accurate to convey spatial relatedness. Certainly this may be the case with the entrepreneur operating in an uncertain environment while trying to create a yet new venture. Perhaps this would explain why some people prefer to purchase a franchise where the cognitive map is more explicit, detailed, and perhaps more accurate.

The symbolization of events brings forth another important characteristic of cognitive maps—the ability to deal with *time* and therefore represent the dynamic nature of events. As noted in Chap. 13, there are time dimensions which need to be taken into account. Events occur with respect to some specific timeframe, whether they are single events or repeated events, whether they are past, present, or future events. While time is important in business, it is also problematic as temporality introduces instability into the map. This in turn calls for a constant refinement of the map—and the territory. Weick (1990) argues that those individuals more capable of selecting, omitting, and organizing are more flexible and therefore more capable of creating more accurate maps. The issue of time ties back to experience.

Experience and time are problematic for other reasons as well. Implicitly, experience and time place events in some kind of order, where one event is assumed to lead to another—a causal relationship, which is too often assumed to be linear. This in turn often leads us to project the past onto the future, as if the future already took place. In other words, the best predictor of future behavior is past behavior. This kind of causal and predictive logic is how we like to represent events and things in organizations, e.g., decision-making processes. It is like the map of the world in the beginning of this chapter. Yet we know that a linear and causal modeling of decisions is not an accurate representation of how decisions are made. We do this as it allows for “as accurate calculations as possible” (Ackoff 1970, 1977, 1978) of events and their predicted future and because this is our conception of rational behavior.

The assumption of rationality does not conveniently allow for the inclusion of such fuzzy entities like intuition, gut feelings, experience, fate, luck, or tradition (March 1976). But, even more so these models do not reflect or accommodate for change per se and with respect to goals. They do not deal with the fact that goal development and choice are independent processes conceptually and behaviorally (March 1976; Saraswathy 2001). More on goals and goal motivation can be found in Chap. 13. As human beings, we seek to minimize the cost of failure as opposed to determine the level of affordable loss. Entrepreneurs, operating with restricted amounts of resources, face the reality of calculating the latter—the affordable loss—and to apply inverse causality, i.e., effectuation (Saraswathy 2001, 2003, 2008). We return to the discussion of causation versus effectuation in the section below discussing uses of cognitive maps.

To deepen our understanding of cognitive maps in the context of entrepreneurship, we will take a detour into the areas of organization theory and strategic management. These are where cognitive maps, or cognitive mapping, have been used for decades as means for representing managerial and collective thoughts. Thus maps provide sense making of organizational and strategic behaviors, i.e., actions (Huff 1990).

9.3 Cognitive Maps in Management and Entrepreneurship

Research on managerial and organizational cognition gained wider interest with the emergence of the concept of strategic groups (Porter 1980; Dess and Davis 1984; Hodgkinson 1997). The review by Walsh (1995) shows an impressive amount of 70 different concepts. A large proportion of the concepts reflect a top-down theory-driven information-processing construct. This rationale seeks to identify (i) knowledge structures that represent some information environment in relation to some important consequences, (ii) the origins of the knowledge structures, and (iii) how they evolved, so that guidance to change efforts can be made. Research exists on all four ontological levels of analysis: individual, group, organizational, and industry. Nevertheless, a large proportion of this research has focused on large organizations and groups of non-owner managers.

Earlier research on cognitive maps focused on identifying and mapping causal relationships in strategic decisions (Axelrod 1976), in particular with reference to strategy concepts like cause maps (Bougon et al. 1977) and causal maps (Fahey and Narayanan 1989). These terms are often used as synonyms to cognitive maps. As the conceptual names suggest these maps are used for mapping causal relationships following the state-of-the-art rationale for decision-making and problem-solving processes. Early research also studied the impact of heuristics and biases on strategic decision under high uncertainty (Hodgkinson et al. 1999). Later studies revealed that cognitive maps were useful for surfacing perceptions of strategic alternatives (Bowman and Johnson 1992; Calori et al. 1994; Reger and Palmer 1996; Hodgkinson et al. 1999), studying competitive comparison (Porac and Thomas 1990; Daniels et al. 1994; Hodgkinson 1997), structuring complex or messy problems (Eden et al. 1983; Eden and Huxham 1995; Fiol and Huff 1992).

Cognitive maps in the context of entrepreneurship have not been extensively studied although early research on managerial and organizational cognition held the understanding of an individual's screens as important (Cyert and March 1963; March and Simon 1958; Walsh 1995). A computer search, with keywords *entrepreneurship* and *cognitive maps*, on Business Source Premier and Blackwell Synergy³ results in three (!) articles from 1988, 1999, and 2000. The first does not cover entrepreneurship at all (Schwenck 1988), the second is on corporate entrepreneurship (Russell 1999) but is in one of the top entrepreneurship journals, and the third (Hines 2000) compares two qualitative methods for studying entrepreneurial decision making but is not an entrepreneurship journal. Hence, entrepreneurship and cognitive maps, or cognitive mapping, appear to be rather uncharted waters. One might rightfully wonder why. One reason may be that entrepreneurial cognition as a specific area of research is rather recent (Busenitz and Barney 1997; Mitchell et al. 2002, 2007; Krueger 2007), but somehow that seems like a bad excuse rather than a valid explanation as cognitive maps in organization theory and strategy certainly are not new.

³These were chosen as they cover the top entrepreneurship journals.

Therefore, to open up cognitive maps in entrepreneurship, we rely on the ideas and findings from organization theory and strategy to elucidate what cognitive maps are, what they have been used for, and how they can be used to improve our understanding of entrepreneurs and the entrepreneurial. Implicitly, and quite explicitly, we suggest that cognitive maps and cognitive mapping could—and should—be used in entrepreneurship much in the same way as they have been in organization theory and strategy. Much simplified one can argue that the cognitive map for the entrepreneur is that of the individual, or singular of the collective or plural organizational strategy. We are not concerned with large organizations versus small firms. The focus here is on cognitive mapping as a method for capturing a “personal construct system” of the entrepreneur (Kelly 1955; Eden 1988; Eden and Ackermann 1998) rather than the representations of collective thought as often portrayed in organizational theory and strategy. A personal construct system represents the beliefs, values, and embedded expertise and knowledge structures.

9.4 On Those Who Decide and Think Versus Those Who Appear Not to

Analyzing how the research field of entrepreneurship talks about the entrepreneur and entrepreneurial work contrasted with that of managers and managerial work provides a simple illustration of cognitive maps in entrepreneurship. Such a map would be a *researcher's cognitive map*. That is, a personal construct system of the researcher, of what entrepreneurship is to them. In the research literature, the entrepreneur is characterized as the *innovator*, the *creator* of the new (Schumpeter 1934), the *locator* of new ideas and *implementer* of ideas, the *exerciser* of leadership (Baumol 1968), the actor in the process-conscious market theory who exhibiting deliberate behaviors (Kirzner 1973, 1979), and the *possessor* of idiosyncratic knowledge enabling opportunity recognition (Shane and Venkataraman 2000; Gaglio and Katz 2001; Shane 2003; Eckhardt and Shane 2003). While all of these descriptions of the entrepreneur may indeed be true, the entrepreneur is rarely described explicitly as a *decision maker* or a *thinker*, whereas managers are explicitly described by researchers as decision makers and thinkers.

Generally, whether an activity is recognized as entrepreneurial or not tends to be justified by the nature of the action a person (the entrepreneur) undertakes (Landström 2005).⁴ In other words, the focus is on *action* and *activities* undertaken—in most cases—by a person who is assumed to have carefully and consciously thought about those actions *prior* to the action. As researchers, we like to see entrepreneurship as rational behavior, as a phenomena occurring as a result of rational thought and decision-making process following a linear causal logic. A

⁴In The Early History of Entrepreneurial Theory Hoselitz (1951) points out that the earliest use and meaning of entrepreneur was formed during the Middle Ages, i.e., long before Cantillon or Say, and was celui qui entreprend quelque chose—a person who gets things done.

business plan can be seen as documentation of such a thought process. Thus a business plan is physical representation of a cognitive map, an attempt to make tacit knowledge explicit.

In the literature on managerial and organizational cognition, managers are described as strategic decision makers who make decisions about highly complex issues requiring careful thinking. Decision making involves cognition and CEOs (in large organizations) have therefore been considered *cognizers* (Calori et al. 1994). Strategic decisions are said to depend on the cognitive orientation of managers, and strategies are abstractions of managerial thought (Weick 1979; Daft and Weick 1984; Prahalad and Bettis 1986; Mintzberg 1987). Porac and Thomas (1990) argued that decision makers act on a cognitive map of the environment and therefore any strategic response to changes in the competitive environment is based on mental models of competitive strategies. Changes in the competitive environment will, in turn, reciprocally affect mental models (Hodgkinson 1997). A related concept introduced by Prahalad and Bettis (1986)—dominant logic—describes the kind of mental maps developed through experience in one business context that some times are not applicable in another (Pralhad and Bettis 1986; Bettis and Prahalad 1995).

However, it is not only the words used by researchers to describe the activities by entrepreneurs versus managers that are different. As earlier pointed out, it is often a question of more than one manager engaging in some activity. The challenge is to arrive at a collective decision or forming a collective thought that becomes the basis for collective action. In recognizing that there are multiple perceptions, opinions, and actors involved, it has been understood that these may be in conflict with each other. Managerial and organizational cognition has also studied the homogeneity versus heterogeneity of managerial and organizational thought (Daniels et al. 1994). The number of individuals involved has been considered large and the issues are many and complex. These have to be negotiated into a common understanding. Thus cognitive maps have proven instrumental for visualization and clarification in such situations.

Implicitly entrepreneurship seems to have been perceived differently by researchers, that is, much less complex and involving one or only a limited number of individuals. Keeping track of thoughts, perceptions, or opinions in a less complex context has not required a tool for graphical representation. There seems to be a naive distinction between managers and entrepreneurs; the former is a decision maker or a group of decision makers (in large firms) (Learned et al. 1965) and the latter is an innovator or creator, often alone (in small firms). The latter is not explicitly considered a decision maker. Yet, one can only wonder if cognitive maps are any more different between managers and entrepreneurs than between any two individuals?

In reviewing studies on managerial and organizational cognition, it is possible to identify two views; a traditional one which takes the collective top-down approach, and one, which argues that managerial and organizational cognition is diverse and determined by individual cognition (Daniels et al. 1994)—a bottom-up approach. Entrepreneurship is a bottom-up process, or could even be the top *and* the bottom. Even if it has been long argued that entrepreneurs are different from managers, it is

rarely pointed out that this difference could be due to *thought* although it is argued that entrepreneurs appear to perceive their environment, opportunities, risk, etc., differently than those who are not entrepreneurs—some of whom apparently are managers. This has certainly been the case with respect to the concept of risk as discussed in Chap. 13 and Part III.

That is, it is implied that there may be differences in the cognitive structures or knowledge structures for entrepreneurs versus managers. Knowledge structure also refers to thinking and an ability to articulate (language) the thought enabling the construction of a model or a *map* of thought—a cognitive map. A map, as we recall, is a graphical representation that provides a frame of reference (Weick 1990; Fiol and Huff 1992).

Researchers in entrepreneurial cognition explicitly argue that entrepreneurs appear to *think* differently or appear to structure the reality they live in differently from others (Busenitz and Barney 1997; Mitchell et al. 2002, 2007; Carsrud et al. 2009). The specific interest into entrepreneurial cognition boils down to a single question that previous researchers had not been able to answer adequately: why some people and not others are able to recognize opportunities (Mitchell et al. 2002)? Mitchell et al. (2002) argue that the ability to recognize opportunities is due to different cognitions among entrepreneurs, i.e., entrepreneurial cognition, probably much in the same way as managerial strategizing tends to differ depending on differences in managerial cognition (Daniels et al. 1994). Entrepreneurial cognition is defined as (p. 97): “...*the knowledge structures that people use to make assessments, judgments or decisions involving opportunity evaluation and venture creation and growth.*” The definition implies that there are knowledge entities that can be organized in a meaningful way that will lead to some form of action: assessments, judgments, decisions, evaluations, and creation, i.e., cognitive maps.

9.5 Cognitive Maps as Research Tools

As earlier stated cognitive maps have been used to structure messy organizational and strategic problems in order to focus attention, trigger memory, reveal gaps, highlight key factors, and supply missing information for individuals or groups of individuals. Such maps can be placed on a continuum depending on the purpose of the map.

The purpose will determine the amount of the required interpretive input. Maps requiring less interpretation represent methods that manifest context. Such maps will rarely identify cognitive structures, but when further analyzed will provide us with maps involving extensive interpretation with increasingly complicated models of cognition. In management—and entrepreneurship—this becomes increasingly important, as most firms regardless of size are context specific. The context can be industry, market, country, and nature of the firm (public traded versus family firm). It is not unimportant to understand the context of the firm. In fact it is important to remember that entrepreneurial firms often exist in multiple contexts.

Huff (1990) suggests five different uses for cognitive maps: (i) maps that assess attention, association, and importance of concepts; (ii) maps that show dimensions of categories and cognitive taxonomies; (iii) maps that show influence, causality, and system dynamics; (iv) maps that show the structure of argument and conclusion; and (v) maps that specify schemas, frames, and perceptual codes.

9.5.1 *Maps Assessing Attention, Association, and Importance of Concepts*

These maps seek to identify frequent use of related concepts and how these are associated with related concepts to unravel particular themes. The basic assumption is that perception is influenced by language and many languages have more than one word for describing various phenomena. Consequently, within entrepreneurship research such maps could well be used for studying differences in perception of the term *entrepreneur* between researchers and entrepreneurs, or between other stakeholders like venture capitalists or policy makers. Cognitive maps would be instrumental to study what different people associate with concepts like entrepreneurship and entrepreneurial work.

Let us examine the words used to describe entrepreneurship. The word entrepreneur, or entrepreneurship, when translated to different languages may acquire multiple meanings. In Swedish, two different words can be used: *entreprenör* and *företagare*. The former is a direct translation of the English word, whereas the latter translates back into English as “one who does.” In Finnish, the word is *yrittäjä*, which translates back to English as “one who tries” (and a firm is *yritys*, which literally translates as “a trial”!). But, in addition to the direct linguistic translations, these words often embed a much wider and richer tacit meaning, which when used trigger different associations and perceptions of an individual as well as the associated activities (Johannisson 2005). It is not uncommon that entrepreneurs do not recognize themselves in the academic descriptions of entrepreneurs. Similarly, many that the academic research community would describe as entrepreneurs would not call themselves entrepreneurs, e.g., artists, or creators of non-profit social service organizations.

One method of looking at cognitive maps is content analysis. Krippendorff (2004), for example, describes content analysis as a form of cognitive map, especially when used for studying words and the use of words. But, from the above we can see that this is not entirely unproblematic. It is not clear if frequency of words indicates saliency. Likewise do changes in the words used indicate change in attention or understanding. Finally, it is not clear if a valid comparison of word use can be made as variations frequently occur across individuals, organizational, or national cultures (Huff 1990). Therefore, it is suggested that word counts should be used with additional methods of analysis when using this approach to study cognitive maps of entrepreneurs.

9.5.2 Maps of Categories, Cognitive Taxonomies, and Cognitive Frameworks

Frequently within research we categorize for pedagogic reasons in order to facilitate sense making and learning for students. Categories and specific links between concepts create an organized memory, which supports additional thought processes. Sometimes the categories are artifacts and not necessarily true representations of reality. A good example is provided from the field of strategy and categorization of schools of thought in strategy. Mintzberg et al. (1998) argues for ten schools of thought that are quite different from the list of ten by Karlöf (1987) and much broader than the six schools of thought suggested by Gilbert et al. (1988) or the simple two-category description offered by Kristamuljana (1994). Moreover, these are academic classifications and it is not likely to find a company operating according to one particular school of thought. Hence, the practical relevance—other than educational—can be disputed. Most managers would likely not use those terms to conceptualize what they do strategically unless trained to do so.

Similar maps have also been drawn in attempts to make sense of entrepreneurship (Grégoire et al. 2006) and more recently social entrepreneurship (Hill et al. 2008). While most category maps are organized as hierarchies, concepts can also be organized in a network manner. These are called semantic networks and it has been argued that they provide a more relevant representation than the hierarchical maps (Huff 1990). For example, Hill et al. (2008) use semantic networks in mapping out social entrepreneurship.

Maps of categorization can be used in the visualization a firm’s competitive environment (Figs. 9.3 and 9.4). This can be done on firm level but also on industry level. Our example below is from the field of biotechnology, where the scientific and technological advances in the 1970s came to change the prevailing paradigm for drug

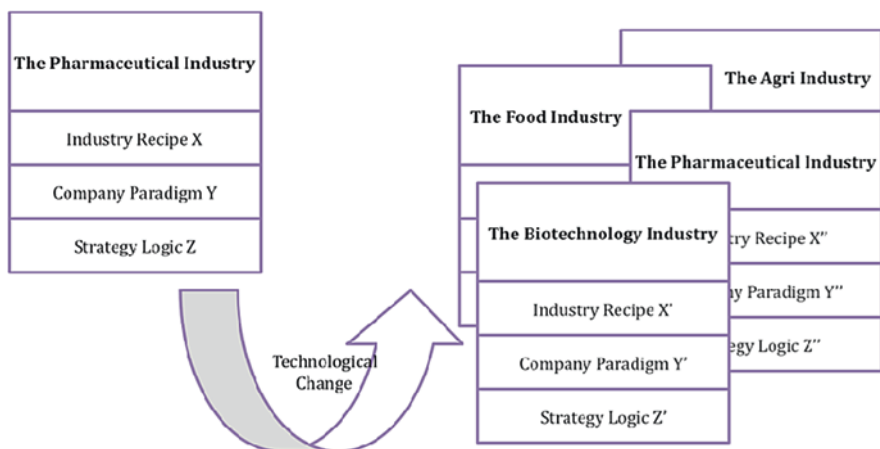


Fig. 9.3 The effect of technological change on the pharmaceutical industry

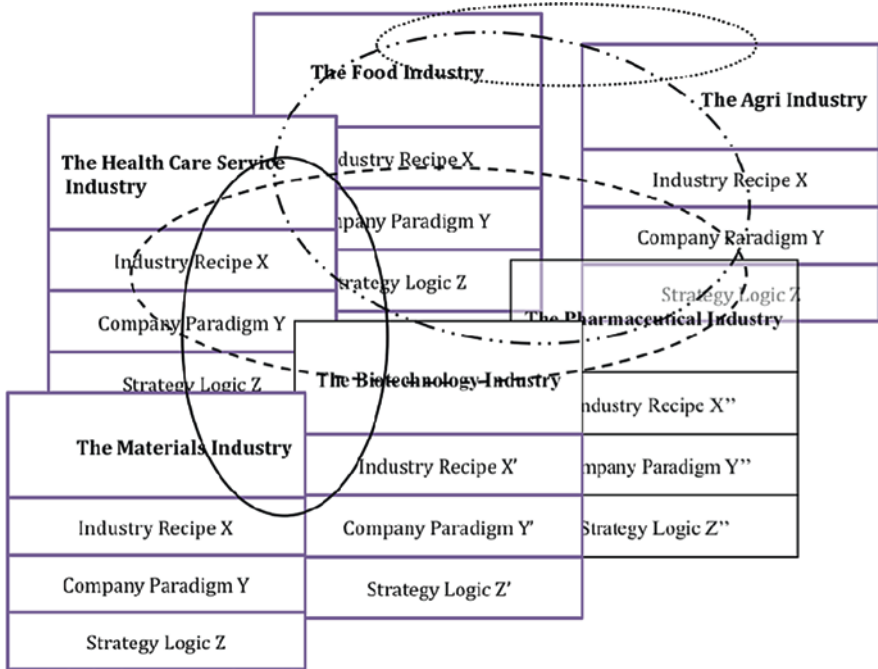


Fig. 9.4 The life science sector

development in the pharmaceutical industry. Moreover, this scientific breakthrough had implications for multiple other industries and fundamentally created a new one, or did it? It all began in November 1973 when Stanley Cohen and Herbert Boyen published an article. The article reported on the scientific breakthrough of recombinant DNA and this is commonly regarded as the genesis of modern biotechnology. Over a period of 10 years, a new paradigm of drug development emerged—biology-based drug development. At first, traditional pharma companies saw little reasons to worry. After all, the firms that seemed to enter the market were small companies employing a few university scientists involved in small-scale protein production for R&D. These could in no way be threatening to large pharma companies more than 100 years old.

This view was seriously jolted through the commercial breakthrough, which took place on October 14, 1980, when Genentech went public and listed their stock on the US stock exchange. Genentech had been founded a few years earlier and employed some 20 persons had gone from small-scale protein production for R&D purpose to large-scale production for commercial purposes. What happened that day in October nobody had been able to anticipate? Genentech was going to sell one million shares for \$35 a piece (Brännback and Carsrud 2008). What was going on?

In Fig. 9.3, we have first depicted the pharmaceutical industry to the left and a major technological change. Until this change, there was a prevailing industry recipe,

company paradigm, and strategy logic. On a macro-level, we have industry recipe which certain common beliefs and assumptions—dominating opinions, which are held as consistent and realistic and which give the actors about the “rules of the game” Grinyer and Spender (1979). A sub-set of an industry recipe is the *company paradigm* (Spender 1989; Johnson and Scholes 1988), which is a representation of managerial perceptions and views of how to succeed in their business environment. These two levels then feed into the strategy logic of the firm, which are concepts on the individual level. This represents the thinking of key person(s) in the firm. To the right in Fig. 9.3, we have four “industries,” which were more or less directly affected by the scientific breakthrough. The agricultural industry had with the lead of Monsanto in the 1970s started to explore the use of biotechnology (Pence 2002). This in turn would lead to the introduction of genetically modified crops, which in turn would impact the food industry (Charles 2001). It was also claimed that biotechnology would also impact the materials as well as computing and military industries (Oliver 1999). Ultimately the health-care industry would also be strongly affected.

In Fig. 9.4, we have depicted the increasing complexities, which today is commonly referred to as the life science sector. The circles imply that the industry, or the served markets, were no longer the neat “boxes” but were converging and could in principle exist anywhere. Thus, competitive analysis would have to be carried out by think-outside-the-box rationale. Competitors could come from entirely other industries. Another example is that data available in 2000 indicating the number of profitable biotechnology firms in the world. The range was from 22 to 75, which must be a sign of different yardsticks of measurement (Brännback et al. 2001).

Clearly the figures above serve as rich cognitive maps for researchers to express the complexity of their findings. If researchers use such maps, it is not so difficult to conceive that entrepreneurs and those in start-up teams have similar such maps to express their cognitive views of their firm and its relations with others in an industry.

9.5.3 Maps of Causal Relationships and Arguments

It is not surprising that maps showing causal relationships are the most frequently used in management literature. These are traditional models of managerial decision making and problem solving based on causal rationality (Bougon et al. 1977; Huff 1990). Causal relationships represent one of the very human ways of comprehending and explaining events. Causal inference allows for interpretation. Causal explanations provide powerful means by which to conduct post hoc analyses of attributions. Biases in attribution and the influence of attribution on the propensity to act are important aspect of this line of research. It is also possible to use causal maps to study changes in belief about the industry environment.

Although the maps in Figs. 9.3 and 9.4 depict categorization it can also be argued that they are representations of changes in the perceptions of the industry environ-

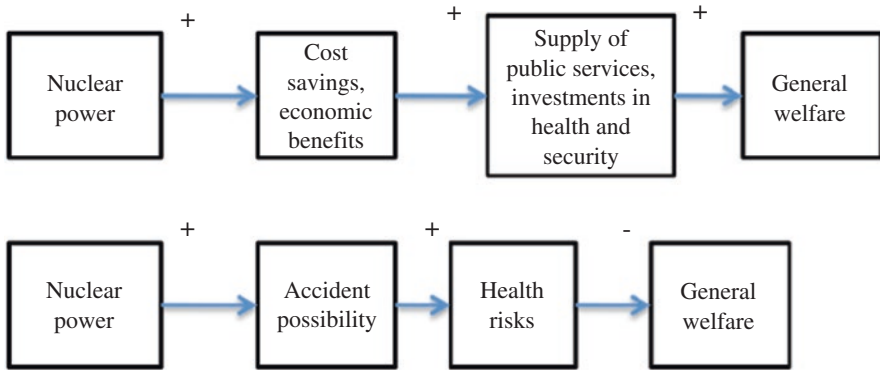


Fig. 9.5 Two cause maps (Brännback 1996)

ment. Graphic representations of causal relationships among concepts require the identification of nodes and directions of the causal relationship. Of particular interest are then such nodes, which can take opposite values or directions (Fig. 9.6).

In Fig. 9.5, two versions of a causal map have been depicted. In both cases, the argument starts with nuclear power and how it will impact general welfare. In the upper version, a positive causal relationship is represented and in the lower string a negative causal relationship is established. These maps were constructed based on arguments in the public press for and against building a new nuclear power plant in Finland. This discussion was rampant in the early 1990s (Brännback and Malaska 1995). Those in favor and those against a new nuclear power plant had quite different views on what would create an increased general welfare for society.

A larger representation of the causal relationship between the arguments in the discussion is shown in Fig. 9.6. Arguments are often built based on a causal logic and therefore the distinction between *cause-maps* and *argument maps* are sometimes unclear. Argument maps are often used—as in the case of nuclear power—to represent arguments for and against an action. However, arguments are often inconclusive and the challenge is to find arguments strong enough to be considered valid as a basis for decision. Clearly, the decision is likely to be subjective.

While the goal of causal maps is to clarify it is easy to see that they can become quite messy. Moreover, causal maps and argument maps show all arguments on the same level of certainty. It is also difficult to assess the role of time, i.e., these maps are not temporal but monotonic (Huff 1990). Nevertheless causal maps are powerful tools as decision aids supporting the choice of alternatives. Decision trees are examples of causal and argument maps. One could certainly research both the cause maps and the argument maps of entrepreneurs as they use these in creating their venture or in convincing a venture capitalist to invest in that firm. The former would be a cause map, while the latter might be an argument map.

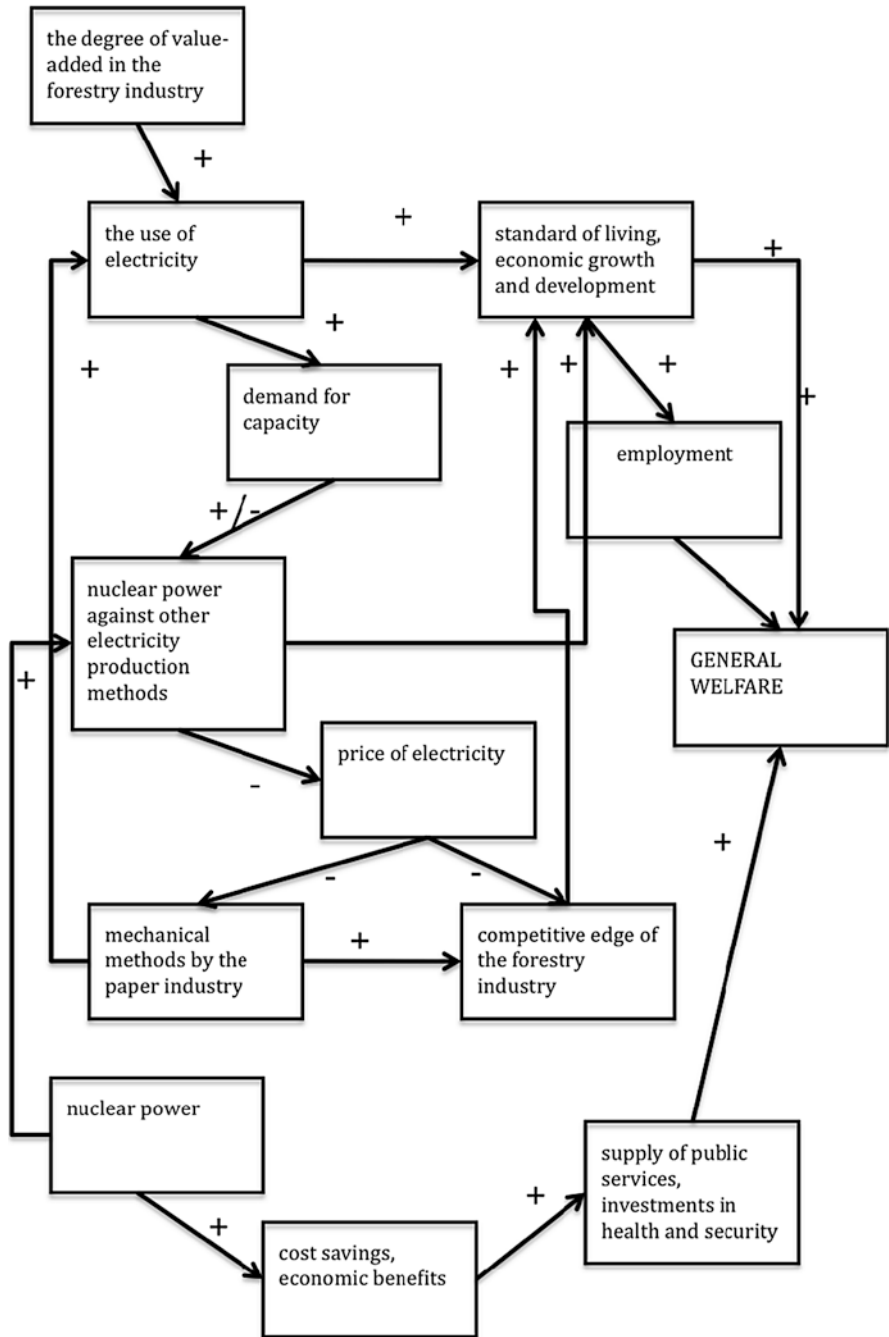


Fig. 9.6 An example of a causal and an argument map (Brännback 1996)

9.5.4 *Entrepreneurial Maps of Causal Relationships*

The above shown illustrations are examples of cognitive maps on a high level of abstraction. We will yet provide another illustration of how cognitive maps can differ from each other. This example concerns a quasi-experiment analyzing how perception of a very real entrepreneurial reality may differ considerably (Carsrud et al. 2009). Prior knowledge and experience seem to partially explain the differences in the generated collective cognitive maps.

Three groups of people with very different experience backgrounds participated: a group of business students with no or very little practical experience, but with presumably a recent relevant theoretical education; a group technology entrepreneurs with practical experience in a related industry; and a group of managers in a large firm with practical experience and extensive understanding of the product and market used in the experiment.

The task was for the participants to select five critical success factors from a list of 21 that would be important for pursuing a specific growth strategy for a high-technology and a low-technology product. The strategies were the following: no growth, 20% annual market share growth over a period of 5 years regardless of profitability, and 20% annual profit growth over a period of 5 years. The two products were the following: organic pasta (500 g) sold at a 20% price premium and functional food pasta (500 g) sold at a 20% price premium. Organic pasta was characterized as a low-technology product and the other as and high technology. For both, the element of technology, either its absence or its presence is used in the claim of the product's superiority. Functional food⁵ is a sub-category of the life science sector. The technology entrepreneurs had experience in a related industry—another life science sector—biomaterials. While biomaterials and functional food are clearly different products, there are similarities in the fundamental science of these two sectors (e.g., biology, biochemistry, chemistry, and medicine). It was, therefore, assumed that these entrepreneurs would possess a technology-based experience that would enable them to understand the products and the markets in order to assess growth strategies. The manager group consisted of experienced middle managers employed in the same food-processing company. The company is a large food processing company, which has in recent years brought innovative products, functional foods, to the market. Recently, the company had launched a functional food pasta on the market. Thus, it was assumed that the task in the experiment was reflected in a real-life situation for this group. The only experience that the students might possess was that of consuming these products—at least ordinary pasta if the functional food version.

⁵Functional food contains an ingredient, a micro-nutrient, or a natural chemical product for which we have scientific results showing either significant and beneficial interactions with the bodily functions or a reduced risk of developing certain diseases. Functional food must remain foods and must demonstrate their effects in amount that can normally be expected to be consumed in the diet: they are not pills or capsules, but part of a normal food pattern.

Each respondent was assigned *one* product and *one* strategy for which to select five critical success factors and rank them in order of importance with respect to their assigned task scenario. Finally the respondents were asked to make these considerations in two growth phases: start-up and take-off. This is important as the theory pertains that critical success factors will change depending on what stage a firm is in. Thus, the quasi-experimental design reflected the kinds of decision-making situations an entrepreneur would frequently face.

Results revealed clear differences in cognitive maps between the three groups, on all dimensions: the products, the strategies, and the different growth phases. The managers and the technology entrepreneurs were apparently better in envisioning the growth strategies as if they had already been accomplished. However, for students they remained open-ended possibilities with no linkage to hands-on experience. For the students, it seemed as if they created some order, *any order*, out there. However, the task was aimed at creating a specific order relating to a growth strategy. In fact, students had problems in distinguishing between “no growth” and “annual profit growth” strategies and they could not at all distinguish between market share growth and annual profit growth strategies. They showed clear problems with conceptualizing the factors generating revenues and what generated profits. This is interesting as they were students within a school of business administration.

While in a seminar for Group 2 this issue was subject to a lengthy discussion, where it was pointed out that although the managers had been able to distinguish between the strategies this rationale does not reflect the reality of the managers’ reasoning. We were told that when launching a product, annual profit growth is not the target—although admitting it ought to be so. The actual target is market share growth (regardless of profit target). Profits are monitored by senior executives and owners, not primarily by operating managers! This certainly shows the impact of specific goals on the maps of managers.

A fourth group of data was collected on business school professors. Their patterns of cognitive elements showed little correspondence to the other three groups. This may be the result of having lumped together marketing, accounting, management, and international business professors together. In addition, a large number failed to complete adequately the questionnaire. Therefore, for publication purposes this group was not reported in Carsrud et al. (2009).

9.6 Conclusions

In this chapter, we have attempted to show that cognitive maps are a viable way of both examining the cognitive structures of entrepreneurs and understanding the differences between entrepreneurs and managers in their cognitive structures. We have also attempted to show that these maps will differ in their use and will differ based on prior experience and perceptions. We have tied a research stream in organizational behavior and strategic management to a potential research approach in the

study of the cognitions of entrepreneurs. We have demonstrated how maps are tied to goals and to actions and thus to entrepreneurial motivations and perceptions.

It is clear that this stream of research into the cognitive maps of entrepreneurs has yet to be fully explored. Certainly maps, and entrepreneurial scripts, could yield significant new insights into how entrepreneurs view their world and translate that either into successful or into unsuccessful new ventures.

Finally, we have tried to demonstrate that entrepreneurial researchers likewise have such cognitive maps that influence, sometimes without awareness, their own views of the world. An interesting research question yet to be explored would be the difference in cognitive maps of entrepreneurship researchers who have actually started a venture versus those researchers whose sole experience is via research journals and theoretical discussions. We have attempted to study the cognitive maps of business faculty. In this unpublished research they clearly are not like managers, entrepreneurs, or students. We have yet to describe or explain their rather unusual maps.

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Chapter 10

Cognitive Maps in Entrepreneurship: Understanding Contexts

Malin Brännback and Alan Carsrud

10.1 Introduction

In the original chapter we showed that cognitive maps were a viable tool for examining the cognitive structures of entrepreneurs and how we could reveal the differences in these structures between entrepreneurs and managers. Since then we have seen a growing interest toward entrepreneurial cognition (Mitchell et al. 2014), where it has become highly obvious that understanding cognitive differences is central for understanding what, how, why, and when entrepreneurs *do*. Or how do entrepreneurs think, before they do, and how does that thought impact their doing? In fact, we somewhat provocatively pointed out that managers, and especially CEOs have been portrayed as those that cognize, that is, those who decide and think (and implying that entrepreneurs were not). Yet research into entrepreneurial cognition—which is still rather recent—have argued that entrepreneurs do think differently and structure their realities differently (Busenitz and Barney 1997; Mitchell et al. 2002, 2007; Carsrud et al. 2009; Brännback and Carsrud 2009) In this chapter, we presented cognitive maps as an efficient tool and method for analyzing the differences. Cognitive maps were presented as a method that originated from work by Kelly in 1955 (Kelly 1955) and that it had successfully been applied in, for example, political sciences (Axelrod 1976), but frequently in strategic management (Eden 1988; Huff 1990; Brännback and Malaska 1995; Brännback 1996; Hodgkinson 1997).

While cognitive *maps* as an explicit research method have still to make its ways into entrepreneurship, we have during the past decade seen the diffusion of the

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cognitive maps discussion into entrepreneurship in different ways, where researchers address the same or similar issues through other conceptualizations and different theoretical inroads that essentially are addressed with cognitive maps. Therefore, this reflection will focus on these discussions. In our minds, this will show the theoretical and empirical richness found in the area of entrepreneurial cognition. This is most visible in the growing awareness and discussions of the importance of understanding the role of context in entrepreneurship research as well as practice (Welter 2011; Lippmann and Aldrich 2015, 2016; Gartner and Weleter 2016; Brännback and Carsrud 2016). It is a broad discussion also including topics such as language (Clarke and Cornelissen 2014; Brännback et al. 2014), culture (Aldrich and Yang 2012; Brännback et al. 2014), and history (Whadwani 2016).

But, what are cognitive maps? In a broad sense, they can be described as sense-making tools. Tools that can help us navigate *cognitively*. That is, when we do not understand, they are instrumental for us *to understand*. They are representations of territory and place, i.e., *spatial*. However, the spatial representation is also dependent on time, i.e., maps change over time—take the map of Europe before the fall of the Berlin wall and the map a few years after. Countries just vanished and others were re-created. Maps are *temporal*. But, maps are also *social*, e.g., family trees are representations of family networks over sometimes centuries, and maps are *institutional* in representations of economic or political systems. Think about how we like to describe the world as seven world economies—where some like to add an eight; the State of California and Silicon Valley, in particular.

That is, maps are representations of *contexts* (Welter 2011). Silicon Valley is indeed an economic context—a huge incubator—with relevance to technology entrepreneurship, where one region after another or country after another have tried to replicate the environment elsewhere, with little success of being equally successful.

10.2 Contexts as Maps in Entrepreneurship Research

In the field of strategy the role of context is not new. In fact a firms strategy is often said to be context specific and the fact that it is context specific is also the source of a firms competitive advantage on the served market (context). To us, context is highly important in entrepreneurship research. It would be naïve to assume that context does *not* matter in entrepreneurship since the entrepreneur creates a venture in a country, region, city (three contexts) to serve one or multiple markets (contexts) during a specific time period (context) under certain economic and political realities (contexts), etc. Yet, entrepreneurship scholars have to our minds not done a very good job in providing contextual descriptions.

Contexts are important not only for interpreting the research results but they often serve as *conduits* for identifying research questions setting off an entire study. Contexts will also serve to focus or frame our studies, i.e., what we include/exclude and why we include/exclude. Context will also sometimes determine how a study is

designed; why was a certain research method chosen over another (Carsrud et al. 2014). Context will impact how questions are asked or not asked. This is not only a linguistic issue but also a cultural issue. In certain cultures (contexts) one cannot ask certain questions from, for example, women. Or it is not legally allowed to create databases over individual data without permission from authorities (contexts).

As researchers we are all too familiar with those numerous occasions when a study—which the researcher finds important and interesting with respect to his or her contextual reality—is rendered *uninteresting* by reviewers that do not see the relevance or importance of a particular study because of not being familiar with the context. While the theoretical contribution may be lacking there may indeed be a highly relevant empirical contribution in such a study.

A thorough description of all these examples of contexts becomes, in a sense, cognitive maps for research, which allows others to replicate a study or conduct a different study, compare results and identify meaningful insights. In fact, in many studies contexts are reduced to being a list of *control variables* (Carsrud et al. 2014). However, such list can sometimes become very long or then far too short, reduced to two variables *sex* and *age*. From a methodological point of view contexts are indeed problematic, since they create a dilemma for the requirement of research results to be generalizable, since per definition contexts are specific to a particular and often limited—context!

This problem is all too present in research on culture. Cultural researchers distinguish between *etic* and *emic* culture studies. Etic studies have a reductionist view of culture and often use country as a proxy for culture. By doing so, it is also assumed that a country is a representation of a homogeneous culture, which is rarely the case. In emic studies the impact of culture is included as a contextual characteristic from the very outset (Schaffer and Riordan 2003; Luna and Peracchio 2005; Usunier 2011; Welch et al. 2011; Keysar et al. 2012; Brännback et al. 2014). Taken too its limit the requirement of generalizability in social sciences—the scientific disciplinary context of entrepreneurship—runs the real risk of reducing the relevant peculiarities of entrepreneurial (human) behavior out of the study thus rendering research results irrelevant. Another problem, which seems to be partially due to context, is the assumption of representativeness and that data is normally distributed. It is assumed that data aggregate around the mean, which is stable (Christopher et al. 2015). This is especially problematic in entrepreneurship research as many of highly successful and entrepreneurial companies appear to be outliers on many dimensions, e.g., there is an exceptional entrepreneur (Steve Jobs, Michael Dell, Jack Dorsey, Elon Musk) and the firms show exceptional growth rates. Not only are these companies special, but they also impact the contexts in which they operate, for other firms—for good and for bad. The research by Christopher et al. (2015) analyzed 49 variables among nascent and start-up firms, both input and outcome variables, and found that 48 were *power distributed*. Thus, assuming normal distribution is problematic to say the least, yet that is what most studies do. While the research results have implications for theory and practice, it also raises the question of the role of context with respect to research methods.

10.3 Organizational Forms as Maps in Entrepreneurship

One distinct feature of entrepreneurship is that we study organizations that are *in the making*. We study nascent entrepreneurs, those who are considering becoming entrepreneurs. Then we readily study how that actually happens—we study start-up firms; how a small firm without much of any structure other than a legal form and a budget (sometimes this is missing too) develops into a larger organization. We are very keen on studying the *growth* of such a firm. We then discuss growth rates and number of employees. But, we shun from considering organizational structures. In fact, many are those researchers who will say that entrepreneurship is so nice because you do not have to look at the structures—because there are not any. We do not have to worry about line organization or matrix organization or strategic business units. A small start-up is so nice because it sits so neatly in ones palm everything can be captured with almost a glance. Perhaps this is a problem; not only for researchers but also for practicing entrepreneurs.

The lack of some kind of structure implies the lack of a map even at a perceptual level. As pointed out by Aldrich and Yang (2012) start-up organizations have yet to acquire the blueprints needed for building an organization. The lack of such blueprints or organizational templates—routines (maps), habits (maps), and heuristics (maps)—impacts performance. This is also referred to as the liability of newness (Stinchcombe 1965). These blueprints become maps used by entrepreneurs to build the venture. While some researchers have called organizational forms *cultural codes* Aldrich and Yang (2012) argue that blueprints and cultural codes are different. They refer to work by Hsu and Hannan (2005) who have argued that cultural codes are those held by audiences, i.e., perceptions of an organization that outsiders have of such an organization. In a start-up setting such perceptions (maps) are likely to be highly different from those (maps) by the founders. These culture codes are referred to as *common knowledge* (maps) by outsiders. Blueprints are *internal* maps over how a firm functions, how input becomes output that are specified a priori the business is up and running. “If, however, they cannot locate such blueprints they face the task of developing the required instructions on their own” (Aldrich and Yang 2012, p. 5). We like to define business plans as blueprints and in case the business plan contains false assumptions the entrepreneur having to construct these *ex post*, is essentially creating a venture by effectuation. The development of culture codes and blueprints are ways of creating organizational identities, which again can be seen as cognitive maps of organizational forms (Hsu and Hannan 2005). Interestingly, there is a fairly large stream of research into entrepreneurial identities, but not much on organizational identities in entrepreneurship. How do organizational identities emerge in entrepreneurship? How do such identities impact performance?

The importance of understanding venture creation in larger contexts, how multiple contexts interact and implicitly this cognitive dialog between maps, is captured by Gross (2009: 359) as: “ways of doing and thinking that are tacit, acquire meaning from

widely shared presuppositions and underlying codes, and are tied to particular locations in the social structure and the collective history of groups.” It is the process of how entrepreneurs interpret opportunities and from this then create their ventures. Aldrich and Yang (2012) argue that cultural codes (maps held by outsiders) are incomplete guides to entrepreneurs for the purpose of creating ventures and ensure effective performance, but likewise the blueprints are also incomplete—if not altogether missing.

10.4 Past and Present as Maps

The temporal nature of context is clear. Things take place at a certain time. Yet, we could do a much better job in dealing with time. The past is not something, which occupies the minds of dedicated historians. There is some relevance and merit to *the past informs the present and the present illuminates the past*. We know all too well that most entrepreneurs are constantly dealing with lack of time, or not being fast enough. But, we can also learn from past behavior. With respect to cognitive maps we call for a better understanding of how shared experience shapes entrepreneurial action and thus affects outcomes over time. This is the same issue Lippmann and Aldrich (2015) address in a recent article on generational units and collective memory in the context of entrepreneurship. Once again this is a different way of tackling the fluid nature of cognitive maps and the necessity for doing this. Lippmann and Aldrich make the case of utilizing generational units and collective memory for understanding the emergence of entrepreneurially oriented groups within regions. They do this by analyzing Silicon Valley. While they do not explicitly refer to cognitive maps this is again a vivid example of how sense making is constantly present in entrepreneurial (human) behavior.

Time and history help us cognitively to make sense of events. By explicating when something has taken place we are usually far better off in understanding and to help others understand those things that are unfamiliar which we encounter. We are able to draw cognitive parallels to something familiar that has occurred or we find reasons to why something took place. The question philosophers often like to discuss is whether it is correct to draw conclusions of a past event, based on our present understanding of the same thing. For example, we are frequently upset by discriminations of people based on gender or race that occurred in the past, because it is not considered correct by the present cognitive map (or cultural code)—yet there are places in the world and cultures where there is no conflicting map with this—even today!

The issue here is that we have to sensitize ourselves to an ongoing dialog between the past and the present to enable us to better deal with the future. Thus, contexts help us make sense of, and understand who becomes (and does not become) an entrepreneur and when, why, how, and what then happens. Contexts become cognitive maps for studying entrepreneurship in action.

While cognitive maps have not explicitly become a useful tool for researching entrepreneurship as was envisioned in the original chapter, cognition and the importance of dealing with cognition when studying entrepreneurs has indeed been amplified. It is interesting to discover the multiplicity of research inroads this is taking, and obviously there are endless options of future research issues.

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Chapter 11

Entrepreneurial Scripts and Entrepreneurial Expertise: The Information Processing Perspective

Ronald K. Mitchell, Benjamin T. Mitchell, and J. Robert Mitchell

11.1 Introduction

What is Mind?

No matter.

What is matter?

Never mind.¹

Q: Is this passage believable?

A: In the case of entrepreneurship, the relationship between mind and matter is never more evident than in the new combination/creative destruction process (Schumpeter 1934) invoked by entrepreneurs. But remarkably, until the role of the entrepreneurial mind was explicitly considered in individual entrepreneur-focused research, the connection between mind and matter—entrepreneur and new venture performance—remained elusive.

About 15 years ago (1994), a new narrative began in the search for the “E” in new venture formation entrepreneurship, with the suggestion that entrepreneurship be studied as a form of expertise (Mitchell 1994; Dew et al. 2009). Previously, until Herron (1990) demonstrated that entrepreneurial skill and skill propensity are related to venture performance, the persistent attempts of researchers to link the entrepreneur himself/herself to performance (Cooper et al. 1986; Kunkel 1991;

¹The above passage is a reordering and repunctuation of a quotation by Albert Baez (1967) used by Tom Stonier in the Prologue to his book *Information and the internal structure of the universe*, 1990: Springer-Verlag: London.

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MacMillan and Day 1987; McDougall 1987; Sandberg 1986) met with little success. At that time, it was industry structure and venture strategy that weighed most heavily in this calculus (e.g., Sandberg 1986). Now, in this newly forming narrative, the focus is turning to the expert scripts of entrepreneurs to distinguish entrepreneurial experts from novices (e.g., Mitchell and Chesteen 1995; Gustavsson 2004), entrepreneurs across cultures (e.g., Mitchell and Seawright 1995; Mitchell et al. 2000, 2002), and common entrepreneurial cognitions across levels of analysis (Smith et al. 2009). In fact, Dew et al. (2009: 290) suggest that what makes the scientific study of entrepreneurial expertise interesting is the commonality underlying cognitive processes that support expertise across domains (e.g., Glaser 1984) while each individual domain—such as entrepreneurship—exhibits a rather narrow set of entrepreneurial cognition principles that are typically very specific and are therefore highly useful in developing expertise through teaching entrepreneurship-specific problem-solving and decision-making techniques (e.g., Mitchell 2003, 2005). The common thread is human information processing.

One of the important ideas that the information processing perspective has contributed to the study of the problem-solving and decision-making techniques used in management is the concept of a script: a knowledge structure or schema (Lord and Maher 1991a; Walsh 1995), which refers to organized knowledge about an information environment that gives meaning to concepts or stimuli (Fiske and Taylor 1984). Research interest in the mental templates that guide top-down information processing (Abelson and Black 1986) has been generated in part because of the possibility that the exceptional schema-based performance of experts (Ericsson et al. 1993; Glaser 1984)—that has been demonstrated in a variety of fields such as chess (Chase and Simon 1973b), computer programming (McKeithen et al. 1981), law enforcement (Lurigio and Carroll 1985), and physics (Chi et al. 1982)—might be harnessed and effectively operationalized within the field of management. However, until recently, research results in the study of managerial and organizational cognition have been fragmented (Walsh 1995) and have been limited to particular substantive (content) areas (Lord and Maher 1991a). Further, no general approach has yet been suggested that provides an example of how to systematically examine management-domain specialties such as entrepreneurship, to articulate their knowledge structure, and then to utilize such structures in their further study.

In a recapitulation of the information processing perspective in management research, Walsh (1995) urges scholars in the field to (1) uncover the content and structure of particular knowledge structures that managers might use and (2) “... relate the use of this knowledge structure to consequences of substantive organizational importance ...” (Walsh 1995, 282). In this chapter, consistent with this call and using the past 15 years as a guide, we illustrate the knowledge structures of individuals who specialize in new venture formation—the “E” in new venture formation entrepreneurship.

This chapter addresses both aspects of Walsh’s (1995) call to first illuminate and then to operationalize knowledge structure research in a substantive area. To accomplish this we must tell the information processing story: to explain how the concepts have developed and lay out the key definitions, as we do in the first section. In the

second section of the chapter we take on Task #1: to describe and demonstrate the steps needed to uncover (illuminate) entrepreneurial expert scripts (the structure and content of the knowledge structure used by individual entrepreneurs). Then, in the third section of the chapter, we take on Task #2: and relate the use of this knowledge structure to substantive consequences by describing a prototypical approach for identifying the script-based components of new venture formation expertise and for distinguishing entrepreneurial expertise in individuals (e.g., experts from novices) that has now become somewhat well established in the literature and suggest a template for future research. We conclude in the fourth section, by looking toward the future of entrepreneurial scripts-based research as set within the context of researching the entrepreneurial mind.

11.2 Concepts and Definitions

Information processing theory attempts to explain how information is acquired, stored, and retrieved from the memory of individuals (Neisser 1967). In its short history, the study of human information processing has developed through three somewhat overlapping phases, each one leading ever closer to enabling the study of the entrepreneurial mind. Table 11.1 presents a chronology of key research that has led to the current capability of researchers to use information processing theory (Table 11.1, Section 1), expert information processing theory (Table 11.1, Section 2), and the notion of expert scripts (Table 11.1, Section 3) as one important means by which the entrepreneurial mind can be investigated.

As illustrated in Section 1 of Table 11.1, information processing theory has its roots in the idea that information is a function of human action and that human action can differ vis-à-vis the processes that result in information—that is, information processing. Of particular importance in this phase of research is the (fitting) recognition that there are systematic elements to the processes/processing of information. This results in the development of models that can explain these differences. Lord and Maher (1990) highlight four of these general models each of which provide implicit frameworks for research: rational, limited capacity, expert, and cybernetic. While they note that no single framework is superior, each approach possesses a unique capacity to explain elements of information processing for specific situations and purposes. Of particular interest to management scholars is the expert model because of its potential for explaining dramatic individual-based performance differences between the group with expertise and the group without.

According to expert information processing theory, experts store and retrieve information from long-term memory differently than do novices. Experts utilize highly developed knowledge systems based in long-term memory to establish and maintain exceptional capabilities in specialty areas (Lord and Maher 1990). These knowledge systems are organized around context-relevant scripts (Read 1987). The main assertion of the expert information processing model is that experts outperform novices within their area of expertise because they can recognize immediately that

Table 11.1 Information processing, expert information processing, and expert scripts—a selected chronology

Year	Author(s)	Excerpt	Application to this chapter narrative
1937	von Hayek, FA	Section 1: INFORMATION PROCESSING THEORY ... before we can explain why people commit mistakes, we must first explain why they should ever be right (1937, 34); Two concepts of data (that explain this) are really fundamentally different and ought to be kept carefully apart ... (1) that the subjective data possessed by individuals are mutually compatible; and (2) whether the individual subjective sets of data correspond to the objective data (1937, 39–40)	Knowledge depends on explanations that render data into information
1956	Miller, GA	(Consists of) ... experiments in absolute judgment: ... experiments on the capacity of people to transmit information ... (and) would not have been done without the appearance of information theory (1956, 81)	Such an exercise of human judgment requires a theory of information
1972	Newell, A; Simon, HA	... states the theory [information processing theory] in comprehensive form (1972, 14)	The notion that humans “process” information provides a theoretical foundation for future work
1977	Shiffrin, RM; Schneider, W	A general framework for human information processing is proposed; the framework emphasizes the roles of automatic and controlled processing (1977, 127)	Types of processing are then explored, e.g., automatic and controlled
1979	Lachman R; Lachman, J; Butterfield, EC	An analogy to computers explains the operation of the information-processing system as a whole. In this analogy, information processing is guided by preexisting routines which are similar to computer programs. These routines are stored in long-term memory, but their execution involves short-term memory or attentional capacity (from Lord and Maher 1990)	Processing considerations lead to the rise of the computer metaphor to describe human information processing
1986	Bourne, LE; Dominowski, RL; Loftus, EF; Healy, AF	Cognitive psychologists face the enormous task of explaining phenomena...in systematic, scientific terms. The approach that seems to show the most promise of providing an explanation is based on the notion that human beings are systems for processing information (1986, 11–12)	The computer metaphor further develops; and humans are conceptualized as information processing systems

1990	Lord, RG; Maher, KJ	A general taxonomic system of alternative information-processing models (rational, limited capacity, expert, and cybernetic) found in the management and psychological literatures is developed (1990, 9)	Several types of information processing models develop and are summarized for relevance to the management literature
1995	Walsh, JP	A host of research challenges are identified to help develop a better understanding of knowledge structure representation, development, and use in organizations (1995, 280)	Information processing in organizations presents research challenges
1997	Hinsz, VB; Tindale, RS; Vollrath, DA	A selective review of research highlights the emerging view of groups as information processors A combination of contributions framework provides an additional conceptualization of information processing in groups (1997, 43)	A natural extension of individual information processing to organizations suggests a group level of analysis
1998	Schwarz, N	Since the late 1970s, theorizing in psychological social psychology has been dominated by the computer metaphor of information processing models, which fostered an emphasis on "cold" cognition and the conceptualization of individuals as isolated information processors.... The emerging picture is compatible with social psychology's latest metaphor, humans as motivated tacticians who pragmatically adapt their reasoning strategies to the requirements at hand (1998, 239)	As the study of humans within organization develops, the field migrates away from the computer metaphor of information processing toward a notion of humans as motivated tacticians with pragmatically adaptive reasoning
Section 2: EXPERT INFORMATION PROCESSING THEORY			
1946 (1965)	de Groot, AD	Investigated the cognitive requirements and the thought processes involved in moving a chess piece... (and suggested) that visual memory and visual perception are important attributes and that problem-solving ability is of paramount importance	An initial linkage is suggested between expert task performance (e.g., in chess) and visual memory and visual perception

(continued)

Table 11.1 (continued)

Year	Author(s)	Excerpt	Application to this chapter narrative
1973	Simon, HA; Chase, WG	... proposed the first general theory of expertise, and it was based on the human- information processing theory (Newell and Simon 1972), which assumes that normal, healthy human adults do not differ in terms of basic short-term memory capacity and other fundamental characteristics of elementary cognitive processes (from Ericsson 2005, 234)	The idea develops that experts are different cognitively: specifically in terms of information processing
1973	Chase, WG; Simon, HA	Chase and Simon (1973a, b) extended de Groot's (1946) original findings and demonstrated a new paradigm for studying the complex memory representations of experts (from Ericsson 2005, 235)	A new way to study the complex memory of experts is proposed
1973	Chase, WG; Simon, HA	This paper develops a technique for isolating and studying the perceptual structures that chess players perceive (1973a, 55)	Puts forward techniques that might be useful for studying expert perceptions
1981	Chase, WG; Ericsson, KA	... skilled memory is the rapid and efficient utilization of memory in some knowledge domain to perform a task at an expert level ... (herein) we present our analysis of the cognitive processes underlying this memory feat, and we want to use this specific example to develop what we think are the important theoretical principles that we have discovered about skilled memory (1981, 141)	Introduces the idea that skilled memory might explain expert performance
1982	Chase, WG; Ericsson, KA	A theory of skilled memory is proposed in which the size of working memory expands as skill increases (1982, 1)	Elaborates the idea of skilled memory as an expansion of expert working memory
1983	Fiske, ST; Kinder, DR; Larier, WM	... for experts, but not for novices, knowledge-based inferences were mediated by their clustering of recall ... Expert/novice differences in the use of shared knowledge content encourages more focus on individual differences in strategies for the use of prior knowledge in social cognition (1983, 381)	Proposes the idea (that is later dominant in the literature) that expertise involves both a knowledge base and problem-solving processes

1992	Day, DV; Lord, RG	... to understand more fully the role of managerial cognition in organizations. As such, we (found that) ... experts rely on well-developed, context-dependent Entrepreneurial cognitions in the early stages of their decision making. It is argued that such Entrepreneurial cognitions allow organizational experts to make sense of strategic issues ... (1992, 35)	Begins to suggest the application of expert entrepreneurial cognitions to organizations
1993	Ericsson, KA; Krampe, RT; Tesch-Romer, C	... explains expert performance as the end result of individuals' prolonged efforts to improve performance ... Individual differences, even among elite performers, are closely related to assessed amounts of deliberate practice. Many characteristics once believed to reflect innate talent are actually the result of intense practice extended for a minimum of 10 years (1993, 363)	Introduces the notion of deliberate practice as a key explanation for individual differences in expert performance
1994	Ericsson, KA; Charness, N	Counter to the common belief that expert performance reflects innate abilities and capacities, recent research in different domains of expertise has shown that expert performance is predominantly mediated by acquired complex skills and physiological adaptations (1994, 725)	Counters the "innate abilities" argument that has previously predominated in explanations for expert performance
1994	Mitchell, RK	Differences in new venture formation expertise are explained (where) entrepreneurship theory and expert information processing theory are combined (to result) in the following: (1) the composition of new venture formation expertise is delineated on the basis of empirical findings, (2) The classification of individual venturers into more finely discriminated categories between expert and novice is made more practical, and (3) the process of creating additional expertise in new venture formation novices is documented, better understood, and improved (1994, 5)	Suggests that expert scripts might explain new venture formation (entrepreneurship)

(continued)

Table 11.1 (continued)

Year	Author(s)	Excerpt	Application to this chapter narrative
1995	Ericsson, KA; Kintsch, W	In the proposed theoretical framework cognitive processes are viewed as a sequence of stable states representing end products of processing. In skilled activities, acquired memory skills allow these end products to be stored in long term memory and kept directly accessible by means of retrieval cues in short-term memory, as proposed by skilled memory theory. These theoretical claims are supported by a review of evidence on memory in text comprehension and expert performance in such domains as mental calculation, medical diagnosis, and chess (1995, 211)	Begins to explain how expertise works (e.g., underlying processes, etc.)
1996	Mitchell, RK	Under the principles of information processing theory, expert scripts explain the remarkable performance differences between otherwise “mystical” experts, and novices. Where script content is traced from entrepreneurial oral histories to shared interpretations, insider knowledge is demystified, and practical, understandable insights about how insider-entrepreneurs think are obtained. In this way management history serves the cause of management science (1996, 51)	Provides qualitative evidence and theory to support expert information processing explanations for entrepreneurship
1998	Gobet, F; Simon, HA	... this paper re-examines experimentally the finding of Chase and Simon (1973a) that the differences in ability of chess players at different skill levels to copy and to recall positions are attributable to the experts’ storage of thousands of chunks ... (Results) are highly correlated with those of Chase and Simon. We conclude that the two-second inter-chunk interval used to define chunk boundaries is robust, and that chunks have psychological reality (1998, 225)	Links the concept of chunking to expert script explanations

1998	Sarasvathy, DK; Simon, HA; Lave, L	We compared entrepreneurs with bankers in their perception and management of a variety of risks. Problems included financial risk, risk to human life and health, and risk of a natural disaster. Cluster analysis and content analysis of think-aloud protocols revealed surprising details. Entrepreneurs accept risk as given and focus on controlling the outcomes at any given level of risk; they also frame their problem spaces with personal values and assume greater personal responsibility for the outcomes. Bankers focus on target outcomes—attempting to control risk within structured problem spaces and avoiding situations where they risk higher levels of personal responsibility (1998, 207)	Suggests an expertise-based explanation for traditionally trait-based explanations for entrepreneurship (e.g., risk taking)
1999	Kintsch, W; Patel, VL; Ericsson, KA	A distinction is made between short-term working memory, which is capacity limited, and long-term working memory, which is available to experts in their domain of expertise (1999, 186)	Links work and long-term memory to domain expertise
2003	Ericsson, KA	Discussed here are the implications for broad attainability of highly skilled memory performance in professional and everyday activities (2003, 233)	Refines memory-based explanations for expertise in the professions
2003	Mitchell, RK	Performance comes from cognitions created through deliberate practice (Ericsson et al. 1993), which depends upon individuals' endowments (Ericsson and Charness 1994; Gardner 1983; Gardner, 1993) (2003, 195)	Suggests deliberate practice to be a key factor in individual-based explanations for entrepreneurship
2004	Ericsson, KA; Delaney, PF; Weaver, G; Mahadevan, R	Our paper describes a general experimental approach for studying the structure of exceptional memory (2004, 191)	Delves deeply into the mechanisms used in exceptional memory feats, specifically in the information encoding process

(continued)

Table 11.1 (continued)

Year	Author(s)	Excerpt	Application to this chapter narrative
2005	Ericsson, KA	... a new trend (is emerging) towards capturing the expert performance with representative tasks in the laboratory and focus on how this superior performance is acquired through training and extended deliberate practice (2005, 233)	Suggests how the study of expert performance can benefit from laboratory studies of deliberate practice
2005	Mitchell, RK	The ... implication of the findings in Mitchell and Chesteen (1995) is to establish links among deliberate practice, script enhancement, and transaction cognition theory. The link between deliberate practice and script/expertise enhancement is established through confirmation of the relationship between certain deliberate practice activities—in this case direct contact with individuals who are more expert, which students analyzed metacognitively (by being required to “think about their thinking”)—and changes in the subjects’ cognitive scripts There exist both empirical evidence and evidence from educational practice, which suggest that (the deliberate practice model) may in fact, be generalizable to the education of global entrepreneurs (2005, 190, 206)	Refines the educational implications for the deliberate-practice-based education of entrepreneurs in a general (global) setting
2009	Dew, N; Read, S; Saraswathy, SD; Wiltbank, R	In support of theory, this study demonstrates that entrepreneurial experts frame decisions using an “effectual” logic (identify more potential markets, focus more on building the venture as a whole, pay less attention to predictive information, worry more about making do with resources on hand to invest only what they could afford to lose, and emphasize stitching together networks of partnerships); while novice use a “predictive frame” and tend to “go by the textbook” (2009, 287)	Begins the further exploration of how expert information processing translates to the actual processes whereby entrepreneurs select and enact decisions
1976	Abelson, RP	Section 3: SCRIPTS/KNOWLEDGE STRUCTURES Script processing in attitude formation and decision making	Relates scripts and decision making

1977	Schank, RC; Abelson, RP	Sometimes having recourse to knowledge of a standard sequence of events, the reasons for which we have already determined to our satisfaction, is useful in the understanding process. When a waitress comes to our table with food in a restaurant it is not necessary to figure out what caused her to arrive. It is sufficient to have knowledge of the causal sequence of events in restaurants to allow us to behave appropriately. This knowledge leaves more cognitive capacity available for use in more interesting tasks. It also allows a certain amount of ellipsis in textual accounts of situations that have a commonly recognized sequence of events. These standard sequences of events have been termed scripts (Schank and Abelson 1977, as cited in Abbott and Black 1986, 130)	Develops further the idea that understood task sequence helps to explain expertise due to added cognitive capacity
1982	Glaser, R	... experts store and retrieve information from long-term memory differently than novices do (1982, 292)	Begins to explore expert–novice distinctions in terms of information retrieval
1984	Glaser, R	The interaction between the development of problem-solving and learning skills and the acquisition of structures of domain-specific knowledge is discussed. Suggestions are made for developing thinking abilities in the context of the acquisition of knowledge and skill (1984, 93)	Provides a foundation for both distinguishing experts and novices, and also for explaining the learning processes leading to expertise

(continued)

Table 11.1 (continued)

Year	Author(s)	Excerpt	Application to this chapter narrative
1986	Leddo, J; Abelson, RP	... the hierarchical, goal-subgoal organization of scripts permits individuals to make attributions that depend upon how events proceed sequentially ... the opportunity to distinguish novices from experts occurs at two key points in expertise-specific situations, when the performance of an expert script (an attempt to utilize expertise) might fail ... these points occur either: (1) at the time of script "entry," or (2) as individuals engage in "doing" the things that serve the main goal of a script ... script "entry" depends upon " ... having the objects in question" ... "doing" depends upon two subrequirements: ability and willingness (1986, 121)	Suggests a general sequential structure useful to the study of professional expertise that leads to the higher-level constructs that appear in new venture formation expertise: arrangements, willingness, and ability
1987	Lord, RG; Kernan, MC	This paper focuses on the role cognitive scripts, a unique type of knowledge schema, play in generating purposive behaviors in organizations (1987, 265)	Links scripts to organization
1987	Read, SJ	A model of causal reasoning based on Schank and Abelson's (1977) analysis of knowledge structures is presented. The first part of this article outlines the necessary characteristics of such a model The second part of this article analyzes how the knowledge structures outlined by Schank and Abelson (1977)—scripts, plans, goals, and themes—can be used to construct such causal scenarios, and it presents a process model for the construction of such scenarios (1987, 288)	Suggests the nature of the causal scenarios that provide a basis for the measurement and analysis of expert scripts
1987	Olson, JR; Rueter, HH	... methods developed by cognitive science to reveal human knowledge structures ... are (in) two classes of investigative methods, direct and indirect (1987, 152)	Provides a foundation for the script-cue measurement method
1988	Glaser, R	Experts efficiently translate problem information in a situation into problem solutions (1988, 269)	Suggests how cueing might enable the classification of experts from novices

1995	Mitchell, RK; Chesteen, SA	In this paper we link entrepreneurial expertise with the notion of an expert "script" as a means for enhancing entrepreneurial expertise. The focus of this paper is an instructional pedagogy that improves students' entrepreneurial expertise through the application of the recommendations of expert information theorists regarding script acquisition. Expert information suggests contact with expert scripts as a primary means for acquiring expertise. Concepts from the simulation and gaming literature are employed to design the pedagogy which features such contact as its primary emphasis (1995, 288)	Applies current expert information processing theory to suggest a way to enhance new venture formation expertise and to measure the results using script cues
1999	Glass, RS; Oz, E	This study uses verbal protocol analysis to identify and compare the information cues used by experts and novices (while performing software diagnosis tasks (1999, 40)	Describes how protocol analysis can also be used to assess expert information cueing
2000	Woloschuk, W; Harasym, P; Mandin, H; Jones, A	This study sought to determine the extent to which faculty and students were implementing and utilizing scheme-based problem solving ... the benefits of schemes for problem solving was also evident (2000, 437)	Further develops the problem-solving element of deliberate practice
2000	Mitchell, RK; Smith, JB; Seawright, KK; Morse, EA	Arrangements, willingness, and ability scripts are found to be associated with the venture creation decision, while some two-way interaction effects involving arrangements scripts were also significant. Cultural values of individualism and power-distance are found to be associated with willingness and ability cognitive scripts, and to also be associated with the venture creation decision through interaction with arrangements scripts. These results support and extend theory, and provide preliminary evidence of consistency in cognitive scripts across cultures (2000, 974)	Applies expert information processing theory and script-cue recognition methods to test a model of cross-cultural entrepreneurship

(continued)

Table 11.1 (continued)

Year	Author(s)	Excerpt	Application to this chapter narrative
2001	Day, EA; Arthur, W; Gettman, D	The purpose of this study was to examine the viability of knowledge structures as an operationalization of learning in the context of a task that required a high degree of skill (2001, 1022)	Applies scripts/knowledge structures to the learning in a high-skill task domain
2002	Mitchell, RK; Smith, JB; Morse, EA; Seawright, KW; Peredo, AM; McKenzie, B	In this study we examine three research questions concerned with entrepreneurial cognition and culture: (1) Do entrepreneurs have cognitions distinct from those of other business people? (2) To what extent are entrepreneurial cognitions universal? (3) To what extent do entrepreneurial cognitions differ by national culture? ... using data collected in a field setting that included 990 respondents in eleven countries. We find ... that individuals who possess "professional entrepreneurial cognitions" do indeed have cognitions that are distinct from business non-entrepreneurs ... further confirmation of a universal culture of entrepreneurship ... and in answer to question three, we find (a) observed differences on eight of the ten proposed cognition constructs, and (b) that the pattern of country representation within an empirically-developed set of entrepreneurial archetypes does indeed differ among countries. Our results suggest increasing credibility for the cognitive explanation of entrepreneurship in the cross-cultural setting (2002, 9)	Applies scripts/knowledge structures to differentiating entrepreneurs from nonentrepreneurs and to establishing the extent to which entrepreneurial cognition is more universal across cultures. On the basis of scripts, a set of entrepreneurial cognitive archetypes is developed
2003	Davis, MA; Curtis, MB; Tschetter, JD	... a key factor in differentiating expert and novice performance is the way individuals organize their knowledge ... measures of structural knowledge quality predicted individual differences in performance self-efficacy (2003, 322)	Further explores expert knowledge organization
2004	Zohar, D; Luria, G	... script orientation ... predicted climate level, whereas script simplicity and cross-situational variability predicted climate strength (2004, 322)	Applies script-based observation to explain other organizational features: e.g., climate

2005	Jones, DK; Read, SJ	Experts relied more on events; used a more historical analysis consisting of past states, events, goals, and actions; and, most important, relied heavily on causal reasoning to create a coherent, understandable causal scenario or narrative. In addition, experts' overall explanation networks were significantly more connected (but less centralized) than those of the other groups (2005, 45)	Suggests how expertise—as a social phenomenon (e.g., networks)—might operate in general
2006	Bradley, JH; Paul, R; Seeman, E	... experience alone is not an indicator of expertise. Other factors, such as the cognitive ability to correctly structure those experiences, must also be present (2006, 77)	Reaffirms that expertise and experience are not synonymous
2007	Corbett, AC; Hmieleski, KM	In this article, we examine the interplay and divergence between the role schema of individuals in corporations and the event schemas necessary to launch a new venture. By examining these schemas together, we show how the corporate context can create tension between corporate entrepreneurs' role schemas and the event schemas necessary for entrepreneurship (2007, 103)	Further dimensionalizes the expert/novice analysis repertoire by differentiating between corporate and independent entrepreneurship
2007	Corbett, AC; Neck, HM; DeTienne, DR	... we advance the literature on entrepreneurial human capital by linking cognitive scripts used by corporate entrepreneurs in project termination decisions to corresponding levels of learning (2007, 829)	Applies entrepreneurial scripts in the corporate entrepreneurship setting
2009	Dew, N; Read, S; Sarasvathy, SD; Wiltbank, R	In support of theory, this study demonstrates that entrepreneurial experts frame decisions using an "effectual" logic (identify more potential markets, focus more on building the venture as a whole, pay less attention to predictive information, worry more about making do with resources on hand to invest only what they could afford to lose, and emphasize stitching together networks of partnerships); while novice use a "predictive frame" and tend to "go by the textbook" (2009, 287)	Again, further dimensionalizes the nature of entrepreneurial expertise by demonstrating differences in the underlying logics (e.g., framing) between experts and novices

(continued)

Table 11.1 (continued)

Year	Author(s)	Excerpt	Application to this chapter narrative
2008	Kabanoff, B; Brown, S	We explore the content and structure of top managers' strategic knowledge structures by measuring differences in the level of attention they give in annual reports to strategic issues and themes that Miles and Snow used to describe their main strategic types (2008, 149)	Addresses the need to further uncover the content of various expert scripts (e.g., Walsh 1995)
2008	Seawright, KW; Mitchell, RK; Smith, JB	This research examines cognitive similarities and differences among Russian and U.S. entrepreneurs and nonentrepreneurs. Manova and multiple discriminant analysis results found similarities between U.S. and Russian experts and U.S. and Russian novices with respect to Arrangements, Willingness, and Ability scripts, but differences in these scripts were found between experts and novices, particularly in Russia (2008, 512)	Applies entrepreneurial script explanations to analyze the unexpectedly low entrepreneurship levels in a newly forming market economy
2008	Sarasvathy, S	Suggests how entrepreneurs use logic and insight used to convert problems into opportunities. Effectuation empirics are observations of 27 entrepreneurs which revealed how each individual converted "as if" circumstances into "even if" ones. Cognition of these entrepreneurs compared to MBA students showed stark differences between the ways the two groups approached problem solving. MBA's largely used "causal logic"—starting with a specific goal or desired effect and working towards that end. In contrast, the entrepreneurs used "effectual logic," beginning with themselves and being creative with the resources they had to work with	Provides fine-grained analysis and characterization of entrepreneurial thinking processes as distinct from those of novices

<p>2008</p>	<p>Mitchell, RK; Mitchell, JR; Smith, JB</p>	<p>In this article, we: (1) elaborate on the critical dimensions that represent a multi-construct view of the new transaction commitment mindset and describe ways that these dimensions can be measured; (2) examine the extent to which the recognition of new venture failure impacts the new transaction commitment mindset; and (3) explore the implications of the interaction between failure recognition and the new transaction commitment mindset for an entrepreneur's decision to continue or abandon opportunity creation efforts (2008, 225)</p>	<p>Begins the more fine-grained exploration of entrepreneurial mindsets by assessing the impact of recognizing failure on the opportunity creation process</p>
<p>2009</p>	<p>Smith, JB; Mitchell, JR; Mitchell, RK</p>	<p>... this paper: (1) clarifies the nature of the relationship between entrepreneurial expert scripts and constructs that might represent an entrepreneurial mindset at the individual level of analysis, (2) identifies analogous relationships at the economy level of analysis where the structure found at the individual level informs an economy-level problem, (3) presents a NAFTA-based illustration analysis to demonstrate the extent to which cognitive findings at the individual level can be used to explain economy-level phenomena, and (4) extrapolates from our analysis some of the ways in which script-based comparisons across country or culture can inform the more general task of making information processing-based comparisons among entrepreneurs across other contexts (2009, 815)</p>	<p>Elaborates the usefulness of scripts to enable explanations of how individual-level phenomena (e.g., entrepreneurial scripts) impact economy-level outcomes (e.g., NAFTA trade-issue resolution). Suggests an approach to burgeoning interest in cross-level entrepreneurial cognition research</p>

which novices require great effort to discover—compliance of expertise-specific circumstances with an expert script. The cornerstone literature upon which expert information processing theory concepts are based are presented in Section 2 of Table 11.1. A critical contribution of expert information processing research that is evident in this section is its usefulness in elucidating the latent structure of superior performance. By so doing, it provides a pathway for improving performance. This explanation stands in opposition to previous research that deterministically viewed superior performance as being based in innate abilities and traits. In this way, expert information processing research is fundamental to entrepreneurship research. Interestingly, it is one element of expert information processing theory that has become highly useful in the investigation of the entrepreneurial mind: the notion of expert scripts.

The term “expert script” refers to highly developed, sequentially ordered knowledge in a specific field (Glaser 1984; Leddo and Abelson 1986; Lord and Maher 1990; Read 1987). Scripts are defined as commonly recognized sequences of events that permit rapid comprehension of expertise-specific information by experts (Schank and Abelson 1977), as cited in Abbott and Black 1986. An expert script is most often acquired through extensive real-world experience, and it dramatically improves the information processing capability of an individual (Glaser 1984), although not without the danger of promoting thinking errors such as stereotypic thinking, the inhibition of creative problem solving, and the discouragement of disconfirmation of the script in the face of discrepant information (Walsh 1995). Expert information processing theory generally treats the terms knowledge structure and expert script as synonymous.

The cornerstone literature upon which expert script concepts are based are presented in Section 3 of Table 11.1. The research that is highlighted in this section of the table is important to entrepreneurship because it articulates the action-based steps of experts in their decision making. This is important to the field of entrepreneurship given the central role of individual action in socioeconomic activity (Commons 1931). Additionally, research on expert scripts/knowledge structures also provides an important link between information processing-specific research and the broader literature on entrepreneurial cognition (cf. Mitchell et al. 2007).

Based upon the foregoing conceptual chronology, we are then, in Table 11.2, able to summarize the key terms and definitions that form the foundation of this essay.

We therefore turn our attention to the next section, which describes an approach that can be used to uncover structure and content in entrepreneurial expert scripts.

11.3 The Structure and Content of Entrepreneurial Scripts

In this section of the chapter we (1) define the structure of expert scripts, (2) identify generalized techniques which consistently furnish the essential content of such scripts, and (3) demonstrate these techniques in the case of entrepreneurs.

Table 11.2 Key terms and definitions

Term	Definition
Ability	Possessing the rudimentary techniques and skills necessary to a specialized domain (Leddo and Abelson 1986: 121)
Cue	Pieces of information in expertise-specific problem statements that enable experts to infer further knowledge about the situation
Cue recognition	The ability to recognize a context-relevant cue from other (distracter) information in the environment
Distracter statement	A plausible, even appealing alternative to a script cue to those who are unfamiliar with the content domain (i.e., novices)
Doing	See <i>script doing</i>
Entry	See <i>script entry</i>
Expert	An individual who shows expertise in a given domain; someone with a large knowledge based in a particular content domain (Lord and Maher 1990)
Expert information processing theory	One of the general models of information processing theory where individuals “rely on already developed knowledge structures to supplement simplified means of processing information” (Lord and Maher 1990: 13)
Expert script	Highly developed, sequentially ordered knowledge in a specific field (Glaser 1984; Leddo and Abelson 1986; Lord and Maher 1990; Read 1987), acquired through extensive real-world experience; synonymous with <i>knowledge structure</i>
Expertise	The ability of an individual to, with excellent performance, perform a task in a particular domain
Feasibility	Having the resources available to accomplish a task
Human information processing	The view that human beings are systems for processing information (Bourne et al. 1986)
Information processing	See <i>information processing theory</i>
Information processing perspective	See <i>information processing theory</i>
Information processing theory	A theory that views an individual as a processor of information (Newell and Simon 1972, 5) and attempts to then explain how this information is acquired, stored, and retrieved from memory (Neisser 1967)
Knowledge categories	Broad mental categories that, when differentiated and linked, permit experts to make sense of new knowledge (Bower and Hilgard 1981)
Knowledge structure	Organized knowledge about an information environment that gives meaning to concepts or stimuli (Fiske and Taylor 1984)
Norm	Standard practices that guide experts to perform correctly in their area of specialty (Leddo and Abelson 1986: 107)
Novice	An individual who does not show expertise in a given domain. Often a beginner who does not have experience in that domain
Preliminary knowledge scaffold	Temporary models that “help organize new knowledge and offer a basis for problem solving that leads to the formation of more complete and expert schemata” (Glaser 1984, 101)

(continued)

Table 11.2 (continued)

Term	Definition
Principle of coherence	Requires the use of sufficient knowledge to produce the most intelligible interpretation (Read 1987)
Principle of concretion	Constrains interpretation to the use of the most concrete knowledge possible (Read 1987)
Principle of least commitment	Suggests that people make no more than the minimum assumptions necessary to produce a coherent interpretation (Read 1987)
Principle of exhaustion	Requires that an interpretation account for all the data (Read 1987)
Principle of parsimony	Instructs people to produce an interpretation that maximizes the connections among inputs (Read 1987)
Schema	See <i>knowledge structure</i>
Schematize	To organize knowledge in chunks or packages so that, given a bit of appropriate situational context, an individual has available many likely inferences on what might happen next in a given situation (Abelson and Black 1986)
Script	Commonly recognized sequences of events that permit rapid comprehension of expertise-specific information by experts (Schank and Abelson 1977); mental representations of the causality-connected actions, props, and participants that are involved in common activities (Galambos et al. 1986: p. 19)
Script cue	See <i>cue</i>
Script-cue recognition	See <i>cue recognition</i>
Script doing	Accomplishing the main action and achieving the purpose of the script. Depends on both <i>ability</i> and <i>willingness</i>
Script entry	Concerns the availability of the objects necessary for the enactment of the script. Depends on <i>feasibility</i>
Sequence	The order that a series of events/actions is in regarding a script
Structure guidelines	Criteria that help to describe the structure of relevant scripts. The guidelines include following specific metarules of story comprehension, construction steps, and rules of causal syntax
Willingness	The propensity to act

11.3.1 Structure

The structure of expert scripts is described in the expert information processing theory literature by several key studies (Abelson and Black 1986; Chi et al. 1988; Glaser 1984; Leddo and Abelson 1986; Read 1987) which provide the definitions needed to clarify the nature of script structure. The definitional aspects of script structure presented in the subsections that follow move from the more general to the more specific.

11.3.1.1 Sequences and Norms

The most general element of expert script structure is based upon unique differences in the knowledge organization of experts versus novices. Glaser suggests that the knowledge of novices is topical versus contextual; i.e., it is organized around the literal objects explicitly apparent in a problem statement. Hence, limitations in the thinking of novices are due to their inability to infer further knowledge from the literal cues in expertise-specific problem statements. Conversely, experts' knowledge is organized around principles and abstractions that (1) are not apparent in problem statements, (2) subsume literal objects, and (3) derive instead from a knowledge about the application of particular subject matter, leading experts to generate relevant inferences within the context of the knowledge structure or script that they have acquired (Glaser 1984). Thus expert scripts specify context, because (1) they have a "sequential structure" and (2) they incorporate the "norms" that guide the actions of experts in their area of specialty (Leddo and Abelson 1986: 107). Accordingly, the first, general specification of the structure of an expert script is that it should include both sequences and norms.

11.3.1.2 Categories

Experts make sense of new situations by drawing upon previously stored knowledge (Cohen and Levinthal 1990). Bower and Hilgard suggest that this knowledge is stored in broad categories which, when differentiated and linked, permit individuals to make sense of new knowledge (Bower and Hilgard 1981). In the case of new venture formation, these knowledge categories might include individual attributes (IA) (Carbognell 1979; Chi et al. 1988), individual experiences (IE) (Abelson and Black 1986; Glaser 1984), individual resources (IR) (Chi et al. 1988), organizational characteristics (OC) which make the knowledge structure context-specific (Lord and Maher 1990), and prior training (PT) (Cohen and Levinthal 1990). By pointing to areas that are important to description at the individual level of analysis, which affect outcomes at the group (expertise) and organizational (organizational formation) level (e.g., individually possessed expertise that potentially affects expertise in new venture formation) (Krackhardt 1990; Rousseau 1985; Walsh 1995), these five possible knowledge categories also assist the researcher with a mid-range "preliminary knowledge scaffold" (Glaser 1984) that supports the later identification of substantive content.

11.3.1.3 Structure Guidelines

Expert information processing theory also contains quite specific criteria that help to describe the structure of viable scripts. The identification of specific structure criteria is important, since the criteria utilized within any script definition framework form a

“template” of sorts that can then be applied to proposed depictions of scripts to test for compliance with expert information processing theory. Read provides such a model. The model applies five principles or “metarules” of story comprehension² (Read 1987, 294) identified in expert information processing theory (Granger 1980; Kay 1982; Marr 1977; Wilensky 1983) that affect an individual’s understanding of social interaction. The model itself consists of a six-step construction process³ (Read 1987). Based upon the work of Schank and Abelson (1977), Read’s model employs six rules of causal syntax⁴ that govern how various elements in a script can be causally linked. Although not explicitly recognized by Read, Glaser adds that scripts should be constructed such that they provide literal cues in the problem statement that trigger inference on the part of the subject, since the “... inability to infer further knowledge from the literal cues in the problem statement” is argued to be the reason for the “... problem solving difficulty of novices” (Glaser 1984, 99). We consider Glaser’s observation regarding the differential nature of cue recognition between experts and novices to be a primary tool for uncovering the structure and content of particular knowledge structures (scripts). The metarules, construction steps, and rules of causal syntax, along with the nature of the information used in script-cue development, combine to form specific script structure criteria that may be used to judge the conformance of scripts to expert information processing theory.

11.3.1.4 Structure Definition

Scripts thus consist of sequences, which identify precedence relationships in a goal–subgoal framework (Read 1987) to which adhere the norms that define the expert expectations of each step in that sequence. Further, scripts subsume knowledge categories (five are suggested in the case of new venture formation as noted previously). Finally, scripts are structured according to at least one of three sets of structure guidelines against which they can be evaluated for compliance, provided that they are also in compliance with the inferential cueing criterion specified by Glaser.

²Metarules include the principles of coherence, concretion, least commitment, exhaustion, and parsimony.

³Construction steps include (1) making categorizations about people and situations, (2) connecting subsequently observed actions with the initial scenario, (3) evaluating congruence between actions and the underlying plan, (4) identifying the plan’s goal, (5) evaluating whether the goal is part of a larger plan or whether it is an end in itself, (6) identifying the goal’s source.

⁴Rules of causal syntax include the following: (1) actions and events can result in state changes, (2) states can enable actions and events, (3) states can disable actions, (4) states can initiate mental states, (5) acts can initiate mental states, and (6) mental states can be reasons for actions.

11.3.2 Content

There appear to be two primary alternatives that might be used in the articulation of script content. The first alternative is comprehensive enumeration, that is, to attempt to “take a census” of all the content that relates to a particular domain. The second alternative is some type of sampling upon which inference respecting the “content whole” might be made. Comprehensive enumeration poses significant operational difficulty due to the idiosyncratic and dynamic nature of knowledge in the multitude of expert domains that exist. In fact, the impracticality of comprehensive enumeration may be one of the reasons that the identification of script content has been somewhat daunting to researchers, especially in the management domain. We speculate that one possible reason for the seeming impasse in the identification of script content is because of the assumption that few if any acceptable alternatives to comprehensive enumeration exist. This assumption likely has its roots in expert information processing theory, which has developed largely to support research in artificial intelligence (AI) and expert systems. In this research stream, comprehensive enumeration has been a virtual necessity, due to the requirements of the computer processing medium used to operationalize and test AI and expert systems.

However, there appears to be no such constraint within the management domain. With its roots in the social sciences, and by extension, in the use of inferential statistics as the tool for operationalization and testing, management science has deemed methods which rely upon the sampling of populations for inferential purposes to be acceptable. It is but a minor extension of this logic to suggest that, at least as a beginning point for management research into the content of expert scripts, a sampling of script content might be a practical alternative to comprehensive enumeration. Sampling has the advantage of serviceability, but presently lacks guidelines for operationalization. This chapter develops and operationalizes the sampling alternative, based on the concepts of script-cue recognition.

11.3.2.1 Cue Recognition

A fundamental assertion of expert information processing theory is that experts interpret cues in problem statements differently than do novices (Glaser 1984). Interestingly, the reason for the dissimilarity of interpretation is traceable to differences in the way that individuals organize knowledge. Expert knowledge is “schematized,” i.e., organized in chunks or packages so that, given a bit of appropriate situational context, an individual has many likely inferences available on what might happen next in a given situation (Abelson and Black 1986). The notion of “knowledge chunks” prompts the speculation that if little bits of situational context (representations from expert scripts) were to be provided to individual experts and novices as cues, their ability to recognize the context as applicable to them individually might confirm the structure and content of an expert script, while also revealing

individual levels of expertise. Further, the cue recognition approach suggests that sampling versus full enumeration of script content should be sufficient to discriminate experts from novices.

11.3.3 New Venture Formation Content Identification

A possible approach to uncovering the structure and content of scripts, then, is for the researcher to identify a representative body of literature (in this case a representative body of new venture formation literature) and to construct script cues on the basis of that literature. Then, utilizing the guidelines within expert information processing theory which specify the criteria for script structure, these cues are examined for consistency with expert information processing theory. In this section, the script structure guidelines and content identification techniques previously described are utilized to produce “script cues.” The literature review and analysis method utilized consists of six steps as follows:

1. identify examples of new venture formation-specific knowledge;
2. classify these into those that primarily deal with the *sequence* of expert actions and those that deal with the *norms* that guide those actions;
3. focus on the five suggested knowledge categories of new venture formation: (1) individual attributes (IA), (2) individual experiences (IE), (3) individual resources (IR), (4) organization characteristics (OC), and (5) prior training (PT);
4. further subdivide the focus areas into knowledge that is related to *content* (to the substantive area) and knowledge that is related to *structure* (to the operation of scripts);
5. develop script recognition cues; and
6. compare these cues to the script construction criteria of expert information processing theory to ensure compliance of the cues with theory.

The foregoing steps outline a relatively general adaptation process that can be utilized by researchers in many domains to extract “script cues” from a given literature that are consistent with expert information processing theory. In the following section, the application of this method in the new venture formation context is demonstrated.

11.3.4 Script Structure and Content

A fairly large sampling of literature that describes the individual attributes, experiences, resources, and prior training possessed by entrepreneurs, and the characteristics of successful new ventures themselves, is available. Regarding the extent of the literature review, the application of the “sampling” approach suggested earlier necessitates the exercise of some latitude in judgment on the part of the researcher. Given the objectives of this chapter, it was deemed appropriate to utilize approximately 3

years of a specialized journal plus related texts in entrepreneurship. Accordingly, the literature review was undertaken by reviewing issues of *The Journal of Business Venturing*, the bibliographies of several prominent entrepreneurship texts, relevant expert information processing theory articles, the cognition-related work in entrepreneurship, and the reading lists for various doctoral seminars in strategy and entrepreneurship. From among several hundred titles reviewed, 28 citations that, based upon the judgment of the researchers, conform to the previously defined structure and content criteria were selected to demonstrate the sampling of knowledge from which new venture formation scripts derive. Sample citations are included both in the References section of this chapter and in Table 11.3, which illustrates the results of the sampling process. Table 11.3 citations for each knowledge category are organized under the headings “Sequence” and “Norms” and are subdivided under these two headings into references dealing with “Content” (new venture formation) and those dealing with “Structure” (expert information processing theory), as suggested in the previously developed framework.

Table 11.3 Script content by knowledge area: new venture formation (content) and expert information processing theory (structure) literatures

Area	Sequence	Norms
IA	<p>Content</p> <p>More risk averse individuals become workers, while less risk averse individuals become entrepreneurs (Kihlstrom and Laffont 1979); the search for an opportunity- resource match is a key feature of the entrepreneurial opportunity structure (Glade 1967); project completion tied to Meyers–Briggs profile type (Ginn and Sexton 1990); entrepreneurs have high tolerance for the ambiguity characteristics of new, unfolding situations (Schere 1982)</p>	<p>Content</p> <p>Entrepreneurs have the qualities of assertiveness and initiative (McClelland 1968); are moderate risk-takers who can tolerate ambiguity (Sexton and Bowman-Upton 1985); are creators of new enterprise/combinations (Low and MacMillan 1988; Schumpeter 1934); use lock-in type strategic commitment to attain sustained competitive advantage (Ghemawat 1991); have significant differences in attributes as identified by the Meyers–Briggs instrument (Ginn and Sexton 1990)</p>
	<p>Structure</p> <p>Experts acquire a greater knowledge base in a specific domain (Glaser 1984)</p>	<p>Structure</p> <p>Expert action presupposes willingness even though mistakes might be made (Krueger 1993)</p>
IE	<p>Content</p> <p>Entrepreneurs engage in a deliberate process of network building (MacMillan 1983); knowledge lies waiting to be discovered— entrepreneurs simply recognize changes which have already happened and exploit them (Loasby 1983); previous venture experience is significant to venture performance (Stuart and Abetti 1990); failure episodes cited as related to level of experience (Vesper 1980)</p>	<p>Content</p> <p>Observed entrepreneurial attributes are the product of experience (Low and MacMillan 1988); entrepreneurs’ low need for support and conformity and high need for dominance and autonomy affects the nature of their experiences (Sexton and Bowman-Upton 1985); entrepreneurs usually start firms related to their previous work (Cooper and Dunkelberg 1987)</p>

(continued)

Table 11.3 (continued)

Area	Sequence	Norms
	Structure Experts possess a more elaborate schema which comes from more extensive experience (Chi et al. 1982); have better and less biased recall of relevant information (Fiske et al. 1983; McKeithen et al. 1981)	Structure Becoming an expert takes extensive past experience (Lord and Maher 1990); experts have better and less biased recall of relevant information (Fiske et al. 1983; McKeithen et al. 1981)
IR	Content Sustained competitive advantage is a result of having and engaging strategic resources (Barney 1991); the number of previous venture involvements is by far the most significant individual resource in early performance (Stuart and Abetti 1990)	Content Entrepreneurs who raised their own venture funds had higher proportionate success (Vesper 1980)
	Structure Script entry depends upon having the objects required (Leddo and Abelson 1986); novices do not have the resources (Perkins 1985)	Structure Proper script entry depends upon having the objects required (Leddo and Abelson 1986)
OC	Content The venture incubation process is fostered by contact with other entrepreneurs (Smilor and Gill 1986); the process of internalizing commercial information implies increasing control of assets in a firm, i.e., entrepreneurship (Casson 1982); establishing barriers to entry linked to strategic position (Porter 1985); the steps of entrepreneurial decision making occur within a specific organizational setting (Glade 1967); new ventures develop in stages (Churchill and Lewis 1983)	Content Organizations where isolating mechanisms are high and appropriability is low have good entrepreneurial strategy (Rumelt 1987); the entrepreneurial locus of control holds promise for distinguishing successful from unsuccessful ventures (Brockhaus 1982); experienced venture capitalists have one or two major areas of emphasis which predominate in their thinking, e.g., management, unique opportunity, appropriate return (Hisrich and Jankowicz 1990)
	Structure Experts' mental structures play an integral part in comprehending familiar events in a setting (Read 1987); experts efficiently translate problem information in a situation into problem solutions (Glaser 1988)	Structure Experts efficiently translate problem information in a situation into problem solutions (Glaser 1988)
PT	Content Entrepreneurs expose themselves to information differently (Kaish and Gilad 1991); understanding how value is built is a precondition for sustained competitive advantage (Ghemawat 1991; Porter 1985)	Content Entrepreneurship is a distinctly new discipline which should be studied (McMullan and Long 1990); entrepreneurs tend to be better educated (Cooper and Dunkelberg 1987); more successful entrepreneurs had or acquired key skills (Vesper 1980)

(continued)

Table 11.3 (continued)

Area	Sequence	Norms
	Structure Experts acquire a greater knowledge base in a specific domain (Glaser 1984); experts explain failure in terms of script knowledge (Leddo and Abelson 1986)	Structure An expert's schema is organized around key principles (Lord and Maher 1990); story understanding affects attributions (Read 1987)

With structure and content examples from relevant literatures selected, it becomes possible to derive script cues. The set of script recognition cues from which the items utilized in this chapter are drawn are shown in Table 11.4.

The next step in the analysis is to evaluate the structural and content veracity of script cues for compliance with expert information processing theory criteria. For the sake of simplicity and to demonstrate the “usability” of the suggested framework, a set of decision rules that follow from expert information processing theory has been adopted for convenience in this chapter and is proposed at least as a beginning point for extensions of this approach. These decision rules, along with the abbreviations used in the analysis, are as follows:

1. A script recognition cue should comply with either a “metarule,” a script construction “step,” or a causal “syntax” rule (Read 1987).
2. A script recognition cue should derive from one of the knowledge categories, e.g., individual attributes (IA), experiences (IE), resources (IR) or prior training (PT), and/or organizational characteristics (OC).
3. The script recognition cue should describe either new venture formation sequences (SQ), norms (N), or both (SQ/N).
4. The script recognition cue should contain either content (C) or structural (S) elements.
5. A citation (Cite) from the entrepreneurship or expert theory literature should support, respectively, structure or content.

Table 11.5 provides examples of the results of the analysis. For each major set of theory criteria (metarules, script construction steps, and syntax rules), each of the knowledge categories is analyzed and construction implication exemplars are suggested. This analysis offers evidence that the script recognition cues derived in this chapter comply with expert information processing theory.

11.3.5 Summary

We have demonstrated an approach for “excerpting” representative and structurally consistent script content from a literature. It accomplishes the first objective of this chapter, which is to uncover the structure and content of particular knowledge structures that managers might use (Walsh 1995: 282), in this case, new venture formation expert scripts—the terms scripts and knowledge structures often being used

Table 11.4 Script recognition cues based on expert information processing theory and new venture formation literatures

	Script cue
1.	I am rarely surprised by developments in a new business.
2.	Are you more attracted to people who are ready to take action?
3.	I have more highly developed contacts in the new venture area specifically.
4.	If asked to give my time to a new business I would decide based on how this venture fits into my past experience.
5.	There are times when after I finish a job I wish that I had done it better or worked harder at it.
6.	My knowledge about new businesses is fairly elaborate, due to the many variations I have observed.
7.	When investing in a new venture, I think it is worse to wait too long, and miss a great opportunity.
8.	I own assets such as proprietary technology, patents, or an operating business.
9.	When confronted with a new venture problem I can recall quite vividly the details of similar situations I know about.
10.	I have occasionally divulged a confidence when I should not have.
11.	When someone describes a problem with a new business I recognize key features of the problem quickly and can suggest alternatives from examples I can cite.
12.	It is worse to waste your time thinking over an opportunity than to plunge in without knowing all the risks.
13.	I have personally earned 150% compounded return per year on at least three ventures over 3 years, in cash.
14.	My new venture is/will be protected from competition by patent, secret technology, or knowledge.
15.	I have sometimes said mean, spiteful, or hateful things to people close to me.
16.	It is more important to know about creating new ventures.
17.	I want to get a piece of the big money.
18.	I presently control acquisition or expansion funds in an ongoing business or have my own funds available for venturing.
19.	New ventures, small business, and entrepreneurship are distinctly different disciplines.
20.	In the last 3 years the size of the pool of people and assets I control has grown.
21.	I have occasionally felt envious enough of the possessions of other people to think about stealing.
22.	I like to read periodicals which deal specifically with new ventures and start-up businesses.
23.	Imagine you have just funded a new venture: Would you be worried about not investing enough?
24.	I have started at least three successful new ventures.
25.	I value high payoffs; intelligent craftsmanship; being one-up; well-organized projects; dependability.
26.	During the last 3 years, it is the general consensus that my performance as an entrepreneur has increased.
27.	I am more aware of many new venture situations, some of which succeeded and others which failed, and why.

(continued)

Table 11.4 (continued)

	Script cue
28.	If you had additional money to put to work, would you put it into a venture where you have a “say,” even if there is no track record?
29.	New venture success follows a particular script.
30.	If I try to assess the condition of a new business a few questions lead to the relevant information.
31.	I do not mind being committed to meet a regular payroll if it means that I can have a chance at greater financial success.
32.	I am looking for a place to invest my resources.
33.	I am action oriented.
34.	I have failed in at least one new venture.
35.	My new venture is/will be protected from competition by franchise or other territory restrictions.
36.	I could raise money for a venture if I did not have enough.
37.	Do you want things open to the possibilities?
38.	I have enormous drive, but sometimes need others’ help to complete projects.
39.	I understand how to buy low and sell high.
40.	The new venture stories I recall illustrate principles necessary for success.
41.	I am more comfortable in new situations.
42.	I feel more confident that I know a lot about creating new ventures.
43.	I like getting buyers and sellers together.
44.	When I see a business opportunity I decide to invest based upon how closely it fits my “success scenario.”
45.	I can often see opportunities for my plans to fit with those of other people.
46.	If I have a lot of free time available, it is more desirable to find a new venture to put your time and expertise into than to engage in recreation.
47.	I am very good at a specialty that is in high demand.
48.	I often see ways in which a new combination of people, materials, or products can be of value.

Table 11.5 Script recognition cue compliance evaluation

Script cue	Script structure criterion (Read 1987)	Area	SQ/N	C/S	Cite
6. My knowledge about new businesses is fairly elaborate, due to the many variations I have observed.	Step: Explicit embedding	IE	SQ	S	Chi et al. (1982): Experts possess a more elaborate schema
11. When someone describes a problem with a new business I recognize key features of the problem quickly and can suggest alternatives from examples I can cite.	Syntax: Mental states reason for action	OC	SQ/N	S	Glaser (1988): Experts efficiently translate problem information into problem solutions

(continued)

Table 11.5 (continued)

Script cue	Script structure criterion (Read 1987)	Area	SQ/N	C/S	Cite
22. I like to read periodicals which deal specifically with new ventures and start-up businesses.	Metarule: Concretion	PT	SQ/N	S	Glaser (1984): Experts acquire a greater knowledge base in a specific domain
7. When investing in a new venture, I think it is worse to wait too long and miss a great opportunity.	Syntax: Acts enable mental states	IA	N	S	Leddo and Abelson (1986): Doing presupposes willingness even though mistakes might be made
2. Are you more attracted to people who are ready to take action?	Syntax: Mental states can be reasons for actions	IE	N	C	McClelland (1968): Initiative and assertiveness are characteristic of entrepreneurs
46. If you have a lot of free time available, is it more desirable to find a new venture to put your time and expertise into?	Metarule: Principle of least commitment	IR	N	C	Glade (1967): Opportunity search by entrepreneurs versus nonventure use of resources
3. I have more highly developed contacts in the new venture area specifically.	Steps: Connection to subsequent action	IE	SQ	C	MacMillan (1983): Entrepreneurs use a deliberate process of network building
8. I own proprietary technology, patents, an operating business.	Steps: Evaluation of congruence	OC	SQ/N	S	Leddo and Abelson (1986): Script entry depends on having the objects required
47. I am very good at a specialty that is in high demand.	Syntax: States can disable action	PT	SQ/N	C	Vesper (1980): More successful entrepreneurs had or acquired key skills
35. My new venture is/will be protected from competition by patent, secret technology, or knowledge.	Syntax: States can disable action	OC	SQ/N	C	Rumelt (1987): Isolating mechanisms imply good new business strategy
9. When confronted with a new venture problem I can recall quite vividly the details of similar situations I know about.	Steps: Connection of subsequently observed actions	IE	SQ/N	S	McKeithen et al. (1981): Experts have better recall of relevant information and it is less biased

(continued)

Table 11.5 (continued)

Script cue	Script structure criterion (Read 1987)	Area	SQ/N	C/S	Cite
19. New ventures, small business, and entrepreneurship are distinctly different disciplines.	Metarule: Concretion	PT	N	C	McMullan and Long (1990): Entrepreneurship is a distinct discipline

Area: The knowledge categories include *IA* individual attributes, *IE* experiences, *IR* resources or *PT* prior training, and/or *OC* organizational characteristics

SQ/N: *SQ* sequence; *N* norms

C/S: *C* content; *S* structure

interchangeably. The result is a set of script cues that comply with the standards of expert information processing theory. The development of these script cues then makes it possible to address the second objective of this chapter, which is to relate the use of the identified knowledge structure (in our case entrepreneurial scripts) to consequences of substantive organizational importance.

11.4 Discriminating Experts and Novices

In this next part of the chapter we therefore explain in general terms how researchers can specify and test script-cue recognition-based models of the entrepreneurial mind. This objective may be accomplished in two steps: (1) components of the knowledge structure are derived and (2) the resulting component/constructs are used to classify sample cases by discriminating between new venture formation experts and novices.

11.4.1 Components

In interpreting the results of three studies that seek experts’ explanation for script failure, Leddo and Abelson (1986) identify an opportunity to explore the components of expertise. Their findings suggest three possible components of expertise that might be observed empirically in making distinctions between experts and novices. Essentially, Leddo and Abelson propose that the opportunity to distinguish novices from experts occurs at two key points in expertise-specific situations, when the performance of an expert script (an attempt to utilize expertise) might fail. These points occur either (1) at the time of script “entry” or (2) as individuals engage in “doing” the things that serve the main goal of a script (e.g., take steps to form a new organization).

Script “entry” depends on “...having the objects in question” (Leddo and Abelson 1986, 121). For example, an expert helicopter pilot requires a helicopter, an expert seismic geologist a seismograph, an expert trauma physician a well-equipped emergency room. Script “doing” means accomplishing the main action and achieving the purpose of the script. “Doing” depends on two subrequirements: ability and willingness. Ability is defined as possessing the rudimentary techniques and skills necessary to a specialized domain (e.g., closing the deal may depend on one’s persuasive skill) (Leddo and Abelson 1986, 121). Willingness, in turn, is defined as the propensity to act.

In the case of entrepreneurs, the “Entry” and “Doing” action thresholds of expert information processing theory parallel the theoretical (Shapiro 1982) and empirical (Krueger 1993) action thresholds that explain individual intentions to form a new venture. Thus “Entry” (the beginning processes of organizational formation) depends on feasibility—specifically on arrangements resources from that environment such as capital, opportunity, and contacts, and “Doing” depends on a combination of ability and willingness. Since expert information processing theory suggests that expertise results from an individual’s use of an expert script, it can be argued that new venture formation expertise ought to be related to individual scripts containing the “Entry”-based component “feasibility” and the “Doing” components “ability” and “willingness.” It follows that discrimination among new venture formation experts and between experts and novices should be possible using these constructs. Thus, one common theme in the expertise-based entrepreneurial information processing literature is the following general proposition:

Proposition: New venture formation expertise should consist of three components of expertise represented by the constructs: (1) arrangements, (2) willingness, and (3) opportunity-ability.

This proposition suggests a latent structure as a foundation to guide the identification and definition of a measurement model. This model is based on the script-cue recognition items derived using the previously described approach suggested by expert information processing theory (arrangements, willingness, and opportunity-ability). Once the entrepreneurial script components of this model are defined, researchers are then set up to discriminate, or classify, individuals’ entrepreneurial expertise between expert and novice by testing the likely hypothesis, as further developed in the following paragraphs.

11.4.2 Classification

In addition to uncovering the components of managerial knowledge structures, we also—in this portion of the chapter—attempt to relate the use of knowledge structures to consequences of substantive organizational importance, specifically the formation of new ventures. We suggest that because of the well-known role of entrepreneurial outcomes, e.g., new organizations create jobs, foster innovation, and help keep an economy competitive in an era of increasing globalization, our better understanding of the nature of the influence of individuals’ entrepreneurial mind on

new business formation will have sustained importance to the scholarly community, because of its importance to the business community, and to society as a whole. In particular, the capability for researchers to reliably distinguish between expert and novice entrepreneurial minds opens new pathways for scholars to help people to calibrate their preparation to venture (e.g., Kruger and Dunning 1999) and to better interpret venturing events (e.g., to become aware of the conditions under which failure is only a bump in the road, and when it is “game over;” e.g., Mitchell et al. 2008).

This distinguishing capability is an applied specialty, where expert information processing theory, which suggests how to discriminate experts from novices, explains how experts use specialized scripts to outperform novices in domain-specific tasks such as entrepreneurship. Novices are expected to recognize cues in script problem statements differentially from experts (Glaser 1984). To the extent that the occurrence of successful new venture formation by individuals is associated with expertise, discrimination between experts and novices using script-cue-based indicators of expert information processing entrepreneurs is possible. The following general hypothesis is representative of expectations in the discrimination task:

Hypothesis: Differences exist among the mean vectors of entrepreneurial script-cue recognitions across expert and novice groups.

The research methodology that has developed to enable classification of individuals into expert and novice entrepreneur groups is script-cue recognition based and uses the three theoretical components of expertise suggested by expert information processing theory: arrangements, willingness, and opportunity-ability (e.g., Mitchell 1994; Mitchell et al. 2000). In the next section of the chapter we present the “highlight films” of this methodology. Our purpose is to assist future generations of researchers who would like to use scripts-based research to further explore the entrepreneurial mind and to get a high-level view of the methods available and thus become familiar with the general issues and approaches that such future researchers should be cognizant of in their own work.

11.4.3 A Methods Template

In our research, we have established an empirical methodology that can apply the results of the literature review and analysis methodology described in the prior section of this chapter. We summarize it, using the standard methods section format: data gathering, measurement, analysis present in brief overview to provide an illustration as a point of departure for future research.

11.4.3.1 Data Gathering

Data in this type of research consist of observations of the script-cue recognitions of individuals. Data are collected through the use of a questionnaire that incorporates specific script-cue recognition items in an a priori relationship to the proposed

theoretical components. In the past we have used various strategies for obtaining respondents: usually by working with an SBDC or Chamber of Commerce or through local assistants in a variety of countries and settings. In response to the present difficulty of accessing sampling frames for probability samples in social science research (Pedhazur and Schmelkin 1991), and in international entrepreneurship research in particular (McDougall and Oviatt 1997, 303), a purposeful sampling approach is justified (Mitchell et al. 2000). Acceptable samples range in approximate size from 200 to 1,000 respondents depending upon the nature of the study.

11.4.3.2 Measurement

Each item in the questionnaire consists of a “two-alternative” multiple choice-type question. One alternative is the script cue as developed previously. The other, we suggest, should be a distracter statement, a plausible, even appealing alternative to those who are unfamiliar with new venture creation. Distracter statements that appeal to individuals’ notions of social desirability (Crowne and Marlowe 1964) or that conform to commonly accepted entrepreneurial myths add additional distinguishing power to script-cue recognitions as an empirical reference point, since the likelihood that novices will select a script cue is markedly diminished by the availability of an appealing but wrong choice that only an expert could avoid. Each script-cue recognition is coded “1,” each nonrecognition “0,” and these are added together to create interval-scaled variables (Nunnally 1978).

11.4.3.3 Data Analysis

For empirically identifying the components of the scripts in the entrepreneurial mind, each script recognition cue should be logically linked to the construct that it represents (e.g., arrangements, willingness, and opportunity-ability). To examine the data structure and discriminant validity, an exploratory factor analysis is conducted on the set of variables linked to these constructs to ascertain the empirically derived components. If successful, items that load on factors consistent with the expectations of theory are used to form scales. Each resulting scale constitutes an indicator. To examine convergent validity, a reliability analysis using Cronbach’s alpha is conducted.⁵

To verify that the constructs fit the latent structure expected, confirmatory factor analysis is used. Confirmatory factor analysis can be constrained in accordance with theory (Jöreskog 1971). In this case the model is constrained to the three-factor expert information processing theory components of new venture formation expertise that are expected. Given the substantive specifications, statistical tests are used to determine whether or not the sample data are consistent with the theoretical constructs.

⁵Over the history of measurement there has been a wide-ranging discussion concerning formative and reflective indicators. Howell et al. (2007) suggests that the current thinking would support the use of Cronbach’s alpha in this case to be appropriate.

Such tests as a P2 measure of the goodness of fit (Jöreskog and Sorbom 1989), the overall goodness of fit index, the adjusted goodness of fit index, and the root mean square residual give indications of the fit of the confirmatory model with the sample data.

Classification of individuals into expert and novice entrepreneur groups⁶ is also script-cue recognition based and uses the three theoretical components of expertise suggested by expert information processing theory: arrangements, willingness, and opportunity-ability. A multiple scale/two group multiple discriminant analysis is conducted to test the expert–novice discrimination hypothesis. The multiple discriminant analysis shows the level of association between a criterion variable with multiple categories (new venture formation expert and novice) and multiple predictor variables (expert information processing theory components of new venture formation expertise) as represented in the following functional relationship: Group Membership = f (Arrangements, Willingness, and Opportunity-ability). Interpretation of the findings is accomplished by evaluating the significance of the statistics related to the discriminant function, assessing the classification effectiveness of the discriminant model (jackknife analysis), and examining the discriminant loadings where applicable.

11.4.3.4 Summary

Over the past decade, we have been able to use the foregoing approach to answer Walsh's (1995) call: (1) uncover the content and structure of particular knowledge structures that managers might use and (2) "...relate the use of this knowledge structure to consequences of substantive organizational importance..." (Walsh 1995, 282). What might then be in store for future research using entrepreneurial scripts to illuminate the recesses of the entrepreneurial mind?

11.5 Toward Further Study of Entrepreneurial Scripts

Consistent with the call by Walsh for research that moves "... beyond individual minds in our considerations of supra-individual knowledge structures" (Walsh 1995, 311), this chapter highlights research wherein information processing in entrepreneurship is viewed as the result of human action wherein differences exist between the scripts of novices and the scripts of experts. At the very least, the foregoing analysis of expert cognitions in the specialized field of new venture formation shows

⁶We have defined entrepreneurial experts as individuals who have (1) formed three or more businesses, at least one of which is a profitable ongoing entity; (2) formed a (nonlifestyle) business that has been in existence for at least 2 years; (3) experience in a combination of (1) and (2) that indicates a high-level organizational formation knowledge; or (4) career experience indicating high levels of familiarity with organizational formation.

that it is possible for management scholars to uncover the structure and content of a particular group knowledge structure—that of new venture formation experts—and relate the use of this knowledge structure to consequences of substantive organizational importance: discriminating new venture formation experts from novices using expert script cues. Unlike much of the previous work in the area, this portion of the chapter highlights the pioneering of the theoretical representation of knowledge structure attributes at the group (expert versus novice) level of analysis. It demonstrates practical steps that researchers can take to excerpt relevant script cues *See* script-cue from a management literature. Then, like the large body of earlier work in the study of cognition in organizations (e.g., Wagner 1987), the empirical portion of the chapter utilizes the representation that is derived in a questionnaire-based interaction between respondent and researcher to record and observe cognition-based behavior (in this case script-cue recognition), thus adding to the empirical work of Bougon et al. (1977) and Krackhardt (1987, 1990) a study that tests knowledge structure attributes at the group level of analysis.

There is a very real sense among information processing scholars such as Lord and Maher (1990, 1991b) that the consideration of alternative information processing models (such as thinking of people as expert information processors who utilize script-based knowledge structures) might suggest alternative methodologies for our examination of the practice of management. Aside from making progress in developing our general capabilities for describing and applying knowledge structures, this expert information processing theory-based alternative to understanding new venture formation may also bring other benefits. Specifically, the expert information processing theory-based lens has several implications for theory and practice in the new venture formation domain.

First, the application of expert information processing theory in this chapter shows the process whereby an understanding is developed (a) that new venture formation expertise has three components consistent with Leddo and Abelson (1986) and with cognition-based models of entrepreneurial intention (Krueger 1993; Shapero 1982) (Section 2—Part I) and (b) that we can develop script-cue recognition items that serve as indicators of these component-constructs (Section 2—Part II).

Second, there appear to be specific implications of the classification results. This chapter demonstrates how research can enable discrimination between new venture formation experts and novices using the script-cue-based indicators of expert information processing theory. As a research community, our having made (and continuing to make) this distinction is important, because it has provided theoretical and empirical assistance in resolving dilemmas surrounding the domain of entrepreneurship, particularly in its role in research on entrepreneurial cognition. The results reported in this chapter take a firm step in this direction. On the basis of the classification results, entrepreneurs no longer must be thought of stereotypically, and identified one-dimensionally as “born risk-takers” (Coulton and Udell 1976), as having a high need for achievement (McClelland 1965), as the product of an “enterprising childhood” (Litvak and Maule 1971), or as masters of strategy and industry structure (Sandberg 1986). Building on the notion of entrepreneurial skill advanced by Herron (1990), this chapter suggests that on the basis of script-cue recognitions, experts in

new venture formation will consistently recognize cues from new venture formation scripts (Glaser 1984; Read 1987) better than will novices. The effectiveness ratios that we have found and reported over the years support this notion, showing that the discriminant function derived in the study contributes to improved discrimination between experts and novices.

Third is a look to the future. One of the most useful features of exploratory research is its potential for future research. Each step taken in this research has produced opportunities to extend the research. For example, the first part of the chapter introduces script structure criteria to the study of management cognitions, proposes a “sampling” versus “full enumeration” as a means for utilizing the content of expert scripts in research, and suggests explicit steps for the extraction and generation of script cues from a pool of scholarly literature. Are the script structure criteria fully tractable? Does sampling have too high a cost in the potential elimination of script richness? Is replication possible using the explicit steps suggested? Indeed, in answering one question, the first part of this research raises multiple follow-on issues.

Further, in the chapter we have been able to identify several weaknesses in the script-cue recognition items used to measure expert information processing theory constructs. Future research should examine the items from the present questionnaire to ascertain which ought to be used as exemplars for the construction of new script cues. Also, given what is now known about the common constructs of new venture formation expertise, it appears possible to select script cues that may more clearly be identified by respondents as relating to particular conceptual domains, thus “tightening up” the correlation between item and construct, and enhancing the overall internal consistency of the scales. A means whereby this instrument could capture the *strength* of script-cue recognitions would also be helpful.

Last, the chapter provides a starting point for other researchers who seek to utilize expert information processing theory to distinguish experts from novices vis-à-vis other relevant questions for entrepreneurship. For example, although this study was conducted using data obtained from respondents who function in the US economy, this is not to suppose that new venture formation expertise is limited to the United States alone. Indeed, cross-cultural application of the instrument used in this research has provided indications of new venture formation expertise as applied in other economic settings (e.g., Mitchell et al. 2000, 2002; Smith et al. 2009). Also, an underlying assumption of this research is that script cues extracted from the entrepreneurship literature apply on a cross-gender basis. This should be tested, and further research that uses the women in entrepreneurship literature as the basis for script-cue generation should be considered.

11.6 Conclusion

We demonstrate in this chapter that the suggestion that successful new venture formation is associated with individual knowledge-based scripts is a nontrivial suggestion. Further, we highlight how the process underlying this assertion fits into the

larger research progression of work on information and information processing. As the previous 15 years have demonstrated, the link between expertise and new venture formation is very useful in helping entrepreneurship researchers illuminate the underlying dynamics of new venture formation so that the productive–destructive aspects of starting businesses can be better managed. As has long been the case, the results of new venture formation are dichotomous. Newly formed organizations tend to be either highly rewarding successes or painful failures (Timmons 1990). Unrivaled formation rates also coincide with unequalled failure rates (Cooper et al. 1988; Shapero and Giglierano 1982). The success–failure dichotomy continues to challenge the researchers who study new venture formation to illuminate the underlying dynamics so that the productive–destructive aspects of the process can be better managed.

In this chapter we offer a deeper understanding of the influence of expert entrepreneurs as a group on new venture formation, highlighting the role of their expert scripts. Such an understanding is of critical importance at this point in time, especially given the impact of new venture formation on new jobs, innovation, and the global competitiveness of an economy. Accordingly, the scholarly community, the business community, and society as a whole stand to benefit greatly if “entrepreneurship as expertise” continues to live up to its potential as an integrating and explanatory notion. It is indeed heartening to be able to report that the structure and content of expert knowledge structures can be systematically identified and then utilized for making distinctions that are of organizational significance in a specific domain. We hope that these findings offer encouragement to others who might wish to replicate these findings in other areas of management specialty. Although the steps taken in this research are but a beginning, possibilities for additional insight portend. That “script,” however, is yet to be written.

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Chapter 12

Situated Scripting and Entrepreneurial Expertise: A Socially Situated View of the Information-Processing Perspective

Benjamin T. Mitchell, J. Robert Mitchell, and Ronald K. Mitchell

12.1 Introduction

Plans are nothing;
planning is everything.

This statement, a “riff” on a quotation from Helmuth von Moltke the Elder’s mid-nineteenth century essay *On Strategy*, highlights a potential dichotomy between *plans* (which are more static, rigid, and potentially never-changing) and *planning* (which is more dynamic, flexible, and potentially ever-changing). The basic premise of this quote is that dynamic action, which may come through planning, is preferred (Weick 1987). Just as understanding dynamic action has been a focus of strategy research (cf. Eisenhardt et al. 2010), so too has it been a focus within entrepreneurial cognition research. Over the past few years a new narrative has emerged within the area of entrepreneurial cognition that has moved away from static *boxologies*—or the “abstract, disembodied stories about autonomous mental processes” that were present in prior social psychology research (Smith and Conrey 2009: 455)—and toward a more dynamic view of entrepreneurial cognition and the entrepreneurial mind (Mitchell et al. 2011). Within this new narrative comes the call to transform the theoretical explanations for how entrepreneurs think from static explanations to dynamic explanations (Dew et al. 2015; Randolph-Seng et al. 2015).

Consistent with this call for dynamism within this new narrative, in this chapter we revisit our original chapter on entrepreneurial scripts and entrepreneurial

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expertise (Mitchell et al. 2009) to better-situate, and understand, entrepreneurial scripts within this new (more dynamic) narrative. We do so by integrating the notion of entrepreneurial expert scripts with the notion of socially situated cognition (Smith and Semin 2004). To accomplish this, we briefly describe what is meant by the term “scripts” and how this concept has been understood in prior research.

In a broad sense, scripts are types of schemata (Abelson 1981), which are the “cognitive framework[s] that an individual uses to impose structure upon, and impart meaning to, social information or social situations in order to facilitate understanding” (Gioia and Poole 1984: 449–450). The very idea that meaning and structure come *from* the knowledge structure to be imposed and imparted *to* the social environment demonstrates the static nature of these schemata (Gioia and Manz 1985). Scripts, which have been defined to be the “mental representations of the causally connected actions, props, and participants that are involved in common activities” (Galambos et al. 1986: 19), are described as being more dynamic than other schemata (see, e.g., Gioia and Manz 1985: 529). But even this dynamism is of a static sort in its focus on dynamism as sequences of behavior in *specific* contexts (e.g., such as a restaurant). Here again, the meaning comes *from* the script, which is enacted as a response *to* the specific environment. However, with this new (more dynamic) narrative, a more “dynamic dynamism” can be introduced to use of the script concept in explanations of entrepreneurial cognition. To bring scripts—specifically as used in entrepreneurial scripts research—up-to-speed, we adopt a socially situated cognition approach (Mitchell et al. 2011; Randolph-Seng et al. 2015; Smith and Semin 2004) and suggest that it is the process of *scripting* itself that enables such dynamic dynamism.

As now captured, if you will, in our “riff” on the earlier quoted “riff” (through use of some verbal substitution): *scripts* are nothing; *scripting* is everything. Taken at face value this statement might seem somewhat extreme. It is not our intension in this chapter to argue for such a one-or-the-other view (i.e., static *versus* dynamic), but rather to provide a more holistic view of entrepreneurial scripts made possible by the increased dynamism introduced by socially situated cognition-based explanations (i.e., static *and* dynamic). Thus, our approach to introducing dynamism into entrepreneurial scripts research can be succinctly described as: “from *scripts* to *scripting*,” where we move the notion of entrepreneurial scripts from a primarily static view to into a narrative with greater dynamism, and hence provide a more comprehensive, complementary view—one that encompasses both the static *and* the dynamic in a more holistic way.

As such, in the first section of this chapter we review the static nature of the entrepreneurial script as presently conceptualized, and suggest that a static view—in the sense of entrepreneurial scripts being predominantly stable or near-stable (versus the static view encompassing rigidity)—is not at odds with the new narrative of dynamism within entrepreneurial cognition research. In the second section, we then discuss how entrepreneurial scripts can be viewed more dynamically through a socially situated cognition lens (Smith and Semin 2004) and introduce a term to refer to dynamism within scripts: namely, *entrepreneurial scripting*. And

finally, in our last section we provide our conceptualization of the holistic bridge: from *scripts* to *scripting*, in particular, by utilizing the analogy of stocks and flows from the resource-based view of strategy (Dierickx and Cool 1989) that helps us to present a more unified conception of the static and dynamic views. In this final section, we also look toward the future of entrepreneurial scripts-based research within the new narrative of dynamism now adopted, we think, within entrepreneurial cognition research; and we suggest how doing so further opens our understanding of the entrepreneurial mind.

12.2 The Seemingly Static Script

Social psychologists have often assumed that inner representations are abstract and context free—stored as prototypes, schemas, or rules, divorced from the specifics of the situations in which the knowledge was acquired and used.¹

As previously noted, scripts, one form of knowledge structure or inner/mental representation (Abelson 1981), have often been viewed as static (Gioia and Manz 1985; Smith and Semin 2004). To better understand how our use of the seemingly static script conceptualization comports with a dynamic view of entrepreneurial cognition, we further tease-out the nuances of the term *static* to define how we view scripts as being “seemingly” static. We then explain how this view can be seen as being consistent with prior uses of entrepreneurial scripts. Specifically, we highlight how this understanding of *static* can provide a basis for using script-cue recognition to differentiate between expert and novice entrepreneurs.

Our analysis suggests that there are many senses of the term *static*. One use of the term *static* is stable and steady, whereas a second use of the term is rigid and never changing. In the former use of the term, something that is *static* is seen as being *dependable* and *firmly established*. This use of the term has positive connotations. In the latter use of the term, something that is *static* is seen as being *non-adaptable* and *with no give*. This use of the term has more negative connotations. Consistent with prior research that demonstrated the possibility of adaptability in scripts (Gioia and Manz 1985), we utilize the former sense of stability or near stability in our definition of a *static* script. In doing so, we can see more clearly the positive contributions of prior research that has used script-cue recognition methodology—as presented in our original chapter (Mitchell et al. 2009). Indeed, research adopting this methodology has enabled differentiation between expert and novice entrepreneurs and has been foundational in beginning to map the entrepreneurial mind.

Under this former conceptualization, then, we expect entrepreneurial expert scripts to be *dependably* present and *firmly established* in the minds of expert entrepreneurs, such that scholars can further map the entrepreneurial mind using the methodology we have previously presented (Mitchell et al. 2009). But this interpretation, we argue, represents only part of the story. For example, photography

¹Smith and Semin (2004: 86).

represents a useful analogy about how the seemingly static script has been used in the past. That is, when a picture is taken, an image is captured of some subject matter at a given point in time. In this analogy, the expert scripts serve as the subject matter of these mental “pictures,” taken at a given point in time. We expect the subject matter (or the knowledge structures in the minds of expert entrepreneurs that make up the basis for expert performance and hence expertise) to be present in such “snapshots” (cf., Baucus et al. 2014 which describes the role of episodic memory in entrepreneurial motivation and affect). In this sense the mental representations are static; and in this way scholars can utilize the presence of such entrepreneurial expert scripts to differentiate between expert and novice entrepreneurs via the script-cue recognition methodology outlined in our original chapter (Mitchell et al. 2009).

But we further argue that an opportunity now exists to build upon prior research in a way that situates the notion of scripts in terms of a more dynamic dynamism (moving beyond sequences of behavior in *specific* contexts to understanding how the sequences of behavior themselves can be dynamic given a changing situation). In other words, we do not go so far as to espouse the latter sense of rigidity in describing how scripts have been used in prior research, and thus do not impose an *ex post* constraint suggesting that prior understandings of entrepreneurial scripts were that they were never-changing (cf., Gioia and Manz 1985). Indeed, returning to the analogy, a snapshot taken at a *different* point in time may be different due to changes (dynamism) in the subject matter being photographed. It is this kind of dynamism that we seek to address. We do so in the next section by highlighting, in theory that encompasses both the development and enactment of entrepreneurial scripts, a missing piece of the entrepreneurial scripts story.

Another criticism against scripts as schemas is that they have often been considered to be abstract and context free (Smith and Semin 2004). In our use of the scripts concept, we have generally not taken this view. In fact, the very nature of the methodology used to differentiate between expert and novice entrepreneurs—via situational cue-based recognition—suggests that the use of entrepreneurial scripts is dependent on the socially situated environments in which entrepreneurs find themselves (cf., Gioia and Manz 1985). This view thus also suggests dynamism within entrepreneurial scripts, which we discuss next.

12.3 Scripting and the More Dynamic Script

The socially situated cognition perspective requires a shift in theoretical focus: explanations of behavior cannot be based solely on the individual’s internal representations, but on the interaction of the individual with the social and physical situation.²

As previously discussed, prior work has suggested socially situated cognition (Smith and Conrey 2009; Smith and Semin 2004) to be a useful theoretical basis for

²Smith and Semin (2004: 76).

Table 12.1 Application of socially situated cognition to entrepreneurial scripting

Socially situated cognition	Entrepreneurial scripting: development	Entrepreneurial scripting: enactment
Situated	Specific entrepreneurial scripts are developed in a variety of different environmental contexts	Entrepreneurial scripts are enacted in contextual socio-economic environment based upon the situational cues present
Adaptive action-oriented	Flexible entrepreneurial scripts are developed over time based on feedback from a changing environment	Entrepreneurial scripts are enacted adaptively as needed based on environment
Distributed	Entrepreneurial scripts are developed over time in concert with a changing set of other social actors, based on the availability of a changing set of tools in the environment	Entrepreneurial scripts are enacted collectively with a specific set of social actors based on the availability of social actors and tools in the environment

addressing dynamism in entrepreneurial cognition research (Mitchell et al. 2011; Randolph-Seng et al. 2015). There are four main components to the socially situated cognition view of entrepreneurial cognition (Mitchell et al. 2011), three of which have been suggested as applicable to the entrepreneurial expertise branch of entrepreneurial cognition research, that is, that entrepreneurial expertise is: situated, adaptive action-oriented, and distributed (Randolph-Seng et al. 2015).

The dynamism represented within the socially situated cognition view allows us to consider what might influence entrepreneurial expert scripts such that they change. We suggest that for the research sub-literature on entrepreneurial scripts, socially situated cognition provides a theoretical framework—via the three components listed—to better understand the dynamism in entrepreneurial scripts. We refer to this dynamic dynamism as *entrepreneurial scripting*, a term we herein introduce, and which we define to be: *the development and enactment of entrepreneurial expert scripts in response to a changing environment*. By *development* we mean changes over time in an entrepreneurial expert script based on changes in the situation; and by *enactment* we mean the utilization of an entrepreneurial expert script depending on the specific situation. Thus, we contend, increased dynamism is introduced to research on entrepreneurial scripts by applying the three components of socially situated cognition applicable to entrepreneurial expertise research to entrepreneurial scripting, as shown in Table 12.1.

As suggested in Table 12.1, socially situated cognition concepts can influence entrepreneurial scripting-based explanations in several ways: in explaining both the development of the scripts and in the enactment of these scripts, based on the situated, adaptive action-oriented, and distributed environments in which entrepreneurs find themselves. We therefore argue that because of this dynamism, entrepreneurial scripts that are unique and tailored to a specific situation can be developed. In this sense, a more dynamic dynamism can be expected to come through the development (scripting) process, which once done enables the enactment of entrepreneurial scripts as more dynamic schemata about entrepreneurship.

12.4 From Scripts to Scripting: A Unification of Views

The fundamental distinction between stocks and flows may be illustrated by the “bathtub” metaphor: at any moment in time, the stock of water is indicated by the level of water in the tub; it is the cumulative result of flows of water into the tub (through the tap) and out of it (through a leak).³

Up to this point we have discussed (separately) how entrepreneurial expert scripts can be viewed either statically or dynamically. A helpful analogy to enable additional clarity in understanding how these views of entrepreneurial scripts can be unified therefore comes from the resource-based view literature (Dierickx and Cool 1989). Known as the “bathtub metaphor,” this analogy likens strategic assets to *stocks* of water in a bathtub accumulated from net *flows* over a period of time. So although scripts had been viewed as more dynamic schemas in prior research (Gioia and Manz 1985), the dynamic dynamism that we seek to apply in our further theorizing concerning entrepreneurial scripts has to do with understanding the *flows* that occur through development (scripting). This is separate from the enactment of the *stocks* (scripts) themselves, which enable action in specific contexts (Gioia and Manz 1985).

In the entrepreneurship setting, entrepreneurial expert scripts (stocks) exist in the minds of expert entrepreneurs at a given point in time, similar to the picture analogy previously used. We suggest that the existence of these scripts in the minds of entrepreneurs, essentially the accumulation of episodic memories (Baucus et al. 2014), is a cumulative result of scripting (flows): the development of entrepreneurial scripts as influenced by the adaptive situated, action-oriented, and distributed environment in which entrepreneurs find themselves. Hence, the static view of entrepreneurial script stocks, and the dynamic view of entrepreneurial scripting flows, may both be considered in entrepreneurial scripts research.

It is therefore to be expected that as a scientific enterprise, the combination of both script-recognition/enactment, and scripting-development now provide a theoretical platform from which substantively improved explanations can be expected. Specifically, much more precision in the evaluation of entrepreneurial cognitions now appears to be possible. For example, in medical research it is helpful to utilize an MRI to detect the extent to which a negative phenomenon is present (e.g., a tumor). However, it is also helpful to understand the changes that have occurred from time 1 to time 2 by taking this picture twice. And it is often even more helpful for the medical researcher to track the differential growth effects given environmental dynamism (e.g., a cancer drug versus a placebo)—taking the picture differentially.

Hence, we argue that the foregoing dynamic dynamism argument—theory suggesting that entrepreneurial expert scripts are both detectable (as in Mitchell et al. 2009) and malleable (as argued herein); but also that this malleability results from permeability at the environment/scripts interface—is highly tractable for future research that can explain questions of entrepreneurial action (McMullen and Shepherd 2006, 2010), reaction (Shepherd and Cardon 2009; Starbuck 2009), development (Mitchell and Shepherd 2012), and demise (Mitchell et al. 2008; Shepherd

³Dierickx and Cool (1989: 1506).

2003). In our view it sets the stage for explanations of variance in entrepreneurs and in entrepreneurship that heretofore have not been considered to be practical. And so, to further “riff” on our “riff,” we conclude with the thought that, in fact, as it concerns entrepreneurial scripts in entrepreneurial cognition research: *entrepreneurial scripts are something*; and *entrepreneurial scripting is something too*.

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Part III
**Cluster Three Motivations, Emotions,
Attributions, and Self-Efficacy**

Chapter 13

Motivations: The Entrepreneurial Mind and Behavior

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13.1 Assumptions and a Brief History

In this chapter we address the complex roles that “motivations” play in entrepreneurial cognitions, intentions, and behaviors and suggest various models and theories that might be useful in the study of entrepreneurial motivations. We do not assume that somehow entrepreneurs are “unique” in their type of motivations from non-entrepreneurs, as did many earlier entrepreneurship researchers. We do, however, believe that entrepreneurial motivations impact entrepreneurial activity and the success of their ventures as demonstrated by Carsrud et al. (1989) and Elfving (2008). We also believe that the individual entrepreneur’s motivations can directly impact the performance of their firm, even beyond the start-up phase. That impact, however, will be complex and moderated by a number of factors, including those found in a resource-based view of the firm. We assume that how motivations are expressed and the foci of those motivations differ for entrepreneurs in various situations and at different stages of their venture’s development.

While we believe emotions are a form of motivation and are clearly related, we refer the reader to the chapter in this book directly addressing emotions and their

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role in entrepreneurial cognitions and behaviors. In addition, while traditional researchers in emotion would not consider “passion” an emotion, the concept of “entrepreneurial passion” is obvious and often referred to by anyone who has interacted with entrepreneurs. Thus, there is a chapter in this book on passion as well.

The study of motivation can be traced to the early works of Freud (1900, 1915) in which his use of the term “instincts” operates a great deal like “drives” or “motivations” (Deutsch and Krauss 1965). For Freud (1915), “instincts” were persistent pressures to change an internal state by external activities, often via “unconscious mental activity” (Deutsch and Krauss 1965). To Freud, instincts (or motivations) influenced behavior on both conscious and unconscious levels.

Given that one’s most fundamental drivers are biologically based, it follows that obtaining what is necessary for survival is a strong human motivation. That basic motivation is inherent in all humans and makes achieving success and avoiding failure a necessity. Since the beginning of time we, as the collective human race, are motivated to survive. In its most basic form, motivation, as defined by Maslow (1946), is the human drive to satisfy the body’s need for survival, with its highest form reflected in achievement motivation (Ach). Achievement motivation is a research stream initially fostered by Atkinson (1957, 1964). A unidimensional approach was taken by McClelland and Winter (1969), and a multi-dimensional approach was also taken by Spence and Helmreich (1978) and Carsrud et al. (1989). For example, Atkinson (1957, 1964) builds his model of achievement motivation on his prior theory, levels of aspirations (clearly something entrepreneurs often do and yet which few entrepreneurship researchers have directly studied). Could aspiration level explain why some people choose to build high growth firms and others choose life-style firms? His theory addresses the tendency of individuals to both achieve success (creating a successful venture) and avoid failure (starvation). We will continue to discuss achievement motivation later in this chapter.

13.2 Motivations to Survive Versus Motivations to Grow

Survival-oriented motivation can be seen in the “necessity entrepreneur” identified in the Global Entrepreneurship Monitor (GEM) studies (Reynolds et al. 2002). This type of entrepreneur is more concerned with avoiding the failure of starvation than other types of entrepreneurs. We have evolved a long way from the days of cavemen (and cavewomen) and in our modern world, we obtain what we need for survival by working to obtain the monetary means required to purchase what we need and want, thus the evolution of motivation. Most people do this by working as an employee for a corporation or other types of organization. They have a particular role to play within that setting and specific tasks they must fulfill in order to be rewarded a pre-determined amount of money (hence work or task motivation) (Pinder 1984, 1998). Whether or not the individual likes the job that he or she must perform or the company in which he or she works can sometimes take a backseat to the more pressing issue of making money in order to support one’s self and family.

However, not everyone fits into the role of an employee working for another person within an organization. Some decide to blaze their own trail through the

business world as entrepreneurs, hence the “opportunistic entrepreneur” of the GEM studies (Reynolds et al. 2002) who is focused on the achievement of success through exploiting an opportunity for some form of gain. Here the intention of the entrepreneur and the pursuit of the recognized opportunity are critical. Obviously, the question of what motivates the pursuit of an opportunity should be of interest to researchers, entrepreneurs creating ventures, and policy makers wishing to foster entrepreneurial behaviors. Researchers have spent a great deal of time looking at opportunity recognition, but not the motivation behind the search. For more on opportunity, the reader is referred to the chapters in Part IV.

Clearly, commercially oriented entrepreneurs are working to earn money, power, prestige, and/or status. But these might not be the only “rewards” or “motivations” they are striving for, as anyone working with either social or biotechnology entrepreneurs will attest to. The search for a disease cure may be a far more powerful motivator than making money, especially if it is the entrepreneur’s child that has the disease. Entrepreneurs have the same motivations as anyone for fulfilling their needs and wants in the world; however, they use those motivations in a different manner—they create ventures rather than just work in them.

In this chapter, we examine the role of various types and theories of motivation in conjunction with cognition, intentions, and behaviors of entrepreneurs. We continue to highlight the fact that entrepreneurs do not necessarily possess motivations that are distinct from others, but rather it is how they use those motivations that help determine the ultimate success or failure of their ventures. This chapter assumes that there is a complex interactive model of entrepreneurial cognitions and behaviors that is consistent with the nature of the other chapters in this book, particularly the chapters on locus of control, intentions, emotions, and passion.

We still have much to learn about the entrepreneur, especially with respect to the role of motivation in the entrepreneur. The sociologist Homans (1961) proposed the motivational principles of hedonism and the theory of the “economic man,” which still have relevance to the study of mankind, especially the entrepreneur. The utilitarian emphasis on the role of “reward,” “drive reduction,” “pleasure,” “reinforcement,” or “satisfiers,” as proposed by psychological theories of motivation in learning (Deutsch and Krauss 1965), can still inform the entrepreneurial researcher and guide their research endeavors. McClelland (1985) summed up the role of motives, values, and skills as those factors that determine what people do in their lives. We believe that entrepreneurship researchers have yet to adequately tie those three factors together although social values clearly impact the development of social ventures and not-for-profit organizations.

13.3 Drive Theories and Incentive Theories

Traditionally, motivation has been studied in order to answer three kinds of questions: (i) What activates a person? (ii) What makes him, or her, choose one venture over another? and (iii) Why do different people respond differently to the same stimuli? These questions give rise to three important aspects of motivation: *activation*,

selection-direction, and *preparedness of response* (Perwin 2003). Existing motivational theories can be divided roughly into *drive theories* and *incentive theories*. Drive theories suggest that there is an internal stimulus, e.g., hunger or fear, driving the person and that the individual seeks a way to reduce the resulting tension. The need for tension reduction thus represents the motivation (Freud 1924; Murray 1938; Festinger 1957). On the other hand, incentive theories emphasize the motivational pull of incentives, i.e., there is an end point in the form of some kind of goal, which pulls the person toward it, such as achievement motivation in the entrepreneur (Carsrud et al. 1989). In other words, in drive theories the push factors dominate, while in incentive theories the pull factors dominate. The cognitive approach to personality psychology has traditionally emphasized the pull factors and the incentive nature of motives (Perwin 2003).

13.4 Diversity and Complexity of Motivational Theories

Fisher (1930) noted that there are fundamentally two schools of motivational theories, one based in economics and the other rooted in psychology. These have been in conflict with each other for decades. Recently, Steel and König (2006) and Wilson (1998) called for the use of *consilience*, which they describe as the linking of facts and fact-based theory across disciplines to create a common framework between the two schools. We also see this lack of *consilience* in entrepreneurship research with respect to its view of the entrepreneur. This might account for the lack of progress in our understanding of the entrepreneurial mind and how it ties to the venture creation process. If the multi-disciplinary nature of entrepreneurship research is to return to looking at motivation as an explanatory factor in entrepreneurial behavior, it must also bridge the wide variety of theories of motivation and tie them to environmentally oriented theories like RBV (Penrose 1959). Likewise, any motivational and resource-based models adopted by entrepreneurship researchers must also have some temporal components as there is an inherent time dimension in opportunity recognition and firm creation.

Entrepreneurship could become indebted to the recent work of Steel and König (2006) on motivation. They have brought together various theories of motivation as applied in economics, management, and psychology (with a time dimension) into what they call temporal motivational theory (TMT). In addition, Locke and Latham (2002, 2004) have married task motivation and goal setting in their recent commentaries. What is interesting is that these two approaches to motivation have yet to be adopted by entrepreneurship researchers. This is despite the fact that entrepreneurs are both time constrained, as in Steel and König's (2006) model, and goal focused, as in the Locke and Latham (2002, 2004) approach. Perhaps it is time for the research community to take a new look at this reality.

Another advantage of both of these theoretical approaches is that they can also be used to look at group motivation and in turn be used to study entrepreneurial teams. We take the view that there is cognitive control of motivation as well as motivational impact on cognitions, building on the work of Freud (1900, 1915),

Zimbardo (1969), and others. This concept of reciprocal effects is important in understanding entrepreneurial motivations and has also been shown to be true for entrepreneurial intentions (Brännback et al. 2007).

13.5 Motivation, Cognitive Dissonance, and Risk

The complexity of motivations is exhibited in cognitive dissonance and risk avoidance, both of which are strong motivators for humans. Research on cognitive dissonance and the need to avoid failure (Cohen and Zimbardo 1969) can be used to explain why entrepreneurs will often do anything to avoid failure in their venture, such as persisting when any non-entrepreneurs would have quit. It is important to remember that cognitive dissonance has much to offer the study of entrepreneurs as well as the behavior of venture capitalists and angel investors.

For example, people high in success motivation, who voluntarily commit themselves to a task promising failure (this would be true of most opportunistic entrepreneurs aiming at high growth firms), will show greater cognitive dissonance the greater the probability of failure (Cohen and Zimbardo 1969). To reduce dissonance, the entrepreneur would be expected to either lower their success motivation *or* their motivation to avoid failure. It is possible that entrepreneurs use very different processes of dissonance reduction than say, managers. It is interesting that this kind of research has not been done to see which dissonance reducer the entrepreneur would enact. Furthering this point, Atkinson (1957) has shown that these two motivations are separate and have different implications for behavior.

However, when risk was previously studied by entrepreneurship researchers, this distinction seems to have been forgotten. Risk was looked at as a risk-taking propensity, or a personality trait, and not seen as two parts of a motivational paradigm that included dissonance. Even the recent commentaries on risk-taking behavior (Lumpkin and Erdogan 2004) (Segal et al. 2005) have not used this approach. Atkinson (1957) also saw the need for success as a basic motivational process to feel competent and self-determining in relation to one's environment. This will later be discussed in more detail in conjunction with multi-dimensional achievement motivation.

Building on Atkinson (1957) and Deci (1975), further discussion on the relationship between success and risk can include the motivation of success (M_s). This motivation is constant in an individual and has an incentive value (I_s), with the achievement of a difficult goal (such as starting a new firm) having more incentive value than a less difficult goal. The incentive value is equal to one minus the probability of success ($I_s + 1 - P_s$). Thus, the tendency to approach starting a firm (T_s) would be seen as

$$T_s = M_s \times P_s \times I_s.$$

Therefore, a person with a strong tendency to start a venture which is moderately risky will be the most pronounced in entrepreneurs with a high motive for success.

Another motivation, fear of failure (F), is also present. That is, the fear of failure is a motive to avoid such failure. There are also expectancies about failure and an incentive value for failure as well. The motive to avoid failure (F) is relatively stable (Deci 1975) and the emotions of shame and embarrassment accompanying failure as an entrepreneur are greater the easier the task: the greater the shame, the greater the incentives to avoid failure. Thus we have $I_f = -(1 - P_f)$. The tendency to avoid failure (T_{af}) becomes

$$T_{af} = (F \times P_f \times I_f).$$

Combining these formulas, we can say that the tendency to approach or avoid an entrepreneurial venture (E) is equal to the tendency of approach success plus the tendency to avoid failure (the latter being a negative number) (Deci 1975). Thus

$$E = (M_s \times P_s \times I_s) + (F \times P_f \times I_f).$$

This kind of modeling could be useful in helping us understand how individuals go about choosing one venture over another or, conversely, in making the decision to stop undertaking a venture.

13.6 Memories as Motivators

Memories of past risks and failures are also related to the issue of risk. Through his review of the motivation to succeed and the role of failure memories, Schlachet (1969) could provide us with a useful model about the impact of serial entrepreneurship on the motivation to start, or not start, subsequent ventures. The motivation of serial entrepreneurs remains unexplored, especially with respect to the impact of memories of risk and prior successes and failures. This may explain why serial entrepreneurs perceive risk differently from less-experienced individuals.

13.7 Intrinsic and Extrinsic Motivations in Entrepreneurs

Although motivation can exist in many forms, it ultimately comes from two places: from inside one's self and from one's outside environment. Motivation could come internally from the emotional high one feels when launching a firm or externally from the admiration of society or money received from the venture. That is, motivation can be *intrinsic* and *extrinsic*. Intrinsic motivation refers to a personal interest in the task, e.g., achievement motivation (Carsrud et al. 1989), and extrinsic motivation refers to an external reward that follows certain behavior (Perwin 2003; Nuttin 1984). Therefore, intrinsic motivations include a large proportion of

self-development and self-actualization. Note, however, intrinsic and extrinsic motivations are not mutually exclusive; one can be motivated by both to perform an act (Nuttin 1984; Elfving 2008).

Ryan and Deci (2000) view motivation as the core of biological, cognitive, and social regulation. They further state that it involves the energy, direction, and persistence of activation and intention. To help better understand the role of both intrinsic and extrinsic motivations, Ryan and Deci (2000) take into account self-determination theory (SDT). SDT spotlights the importance of one's inner-evolved resources for personality development and behavioral self-regulation. Through this theory, Ryan and Deci (2000) empirically identified three inherent psychological needs that are necessary for self-motivation and personality integration. These are the need for competence, relatedness, and autonomy. If these needs are satisfied within an individual concerning a particular act, they will be more inclined to persist at completing the task with intrinsic motivation. Conversely, if these needs are not fully met, they will be more likely to be extrinsically motivated by external factors (Ryan and Deci 2000). Of course, extrinsic and intrinsic motivations can occur together, but Ryan and Deci point to SDT in helping to determine the primary motivator. Applied to entrepreneurs, the extent to which their venture fulfills the needs defined by SDT will contribute to their intrinsic and extrinsic motivation levels.

Entrepreneurial motivation is tied to both internal and external factors (Elfving 2008). Internally, entrepreneurs may be motivated to succeed and accomplish a goal, while externally they may be motivated to be their own boss and obtain wealth. One's need for success is another way of looking at need for achievement (Ach) where one tries to match some standard of excellence, for example, an icon of entrepreneurship such as Bill Gates of Microsoft. More likely, entrepreneurial motivations may be learned or influenced by role models of successful entrepreneurs in one's own family. Directly related to one's intrinsic motivation is one's locus of control. For a more detail discussion on locus of control of motivation, which has a long tradition of research, the reader is referred to the chapter in this book on the topic. Likewise, achievement motivation (Ach) is a special form of intrinsic motivation (Deci 1975; Elfving 2008) and is discussed in detail later in this chapter.

Perhaps no psychologist has had greater impact on the study of intrinsic and extrinsic motivations than Edward Deci (1975) and more recently with the work of Quigley and Tymon (2006) and Elfving (2008). While most entrepreneurial research assumes the entrepreneur is motivated by external rewards such as money, power, status (an economic view of human motivation), we are left with the reality that some people engage in entrepreneurial activities as ends in themselves. This classic definition of intrinsic motivation (Deci 1975) could certainly play a role in why social entrepreneurs start social ventures even when there is no apparent reward for doing so other than some internally generated satisfaction. The idea that an individual engages in entrepreneurial behaviors because of the need for stimulation (a form of intrinsic motivation) is not revolutionary, but the fact that serial entrepreneurs do this habitually may provide some interesting insights into such behavior. That is, once an entrepreneur has had the stimulation of starting a firm, they frequently return

to that behavior because of intrinsic motivation and the internal and external rewards they received doing that behavior in the past. They might persist in trying for internal reasons even if they have never been rewarded externally through a successful venture. They reduce the cognitive dissonance of perceived possible failure by believing they can be successful this time.

13.8 Obsession, Passion, and Entrepreneurial Motivations

Likewise, entrepreneurs have often been described as being fully absorbed in their ventures and even overcommitted to the point of obsession. Koch (1956) pointed out that those engaged in tasks by intrinsic motivation were more highly organized and energized. This might explain why the panel studies (Reynolds et al. 2002) on entrepreneurs found that even those who did not successfully start a business said that they would try again with a new venture. To have ceased starting a venture and yet want to try again is an indication of intrinsic motivation, which needs to be better understood in addition to the role of that motivation in relation to entrepreneurial intentions. This is a part of what we might call “entrepreneurial passion.” For a longer discussion on passion, the reader is referred to the chapter on that topic within this book. Finally, external motivations or rewards would include relatively intangible things such as status, power, social acceptance, with the more tangible eternal rewards being money, stock options, and other forms of compensation.

13.9 Final and Instrumental Motivation

Moreover, it is sometimes appropriate to separate between *final* and *instrumental* motivation (Nuttin 1984; Elfving 2008). When one is doing something to reach a certain goal, one has a final motivation. However, when one is doing something that indirectly leads to the final goal, one has an instrumental motivation. For example, one might have a final goal of losing weight and therefore one attends a cooking class in order to learn how to make healthier food. Attending the cooking class is an instrument to reach the actual goal and thus, the cooking class acts as an instrumental motivation.

As noted, when looking at different kinds of motivations we can understand a person’s behavior only when we put it into a context. We have to look at how he perceives his initial position, i.e., his construction of the behavioral world, and what goals he sets. We can understand his motivation and behavior only in that context. In other words, the behavior or the motivation has to be put in relation to something else, which Nuttin (1984) argues in his relational model of motivation. He suggests that we should study motivation in the context of the individual–environment relationship. How a person behaves and what is perceived as motivating depends on the

person's cognition of the environment and his interaction within it. Motives, goals, and plans do not arise from empty nothingness; they are shaped by their interaction with the environment (Huuskonen 1989).

According to Nuttin (1984), motivation is rooted in a state of need. We can feel a need to have more independence or a need to be loved and this need motivates us to act. Through a cognitive process, the state of need is gradually processed into a more focused orientation, i.e., we make a plan and set goals. Thus, we have taken the step from phase 1 to phase 2 in the behavioral process. These needs cause some tension, but it is worth noting that in this case we are not talking about the type of purely negative tension which occurs in drive theories. According to Nuttin (1984), people want to have a certain amount of tension in their lives. Consequently, in this case, tension should be viewed mainly as a positive challenge as in the case of the entrepreneur building a new venture. Nuttin (1984) points out that once we have reached one goal, i.e., released the tension, we tend to set a new goal immediately, i.e., deliberately create a new tension.

13.10 Life, Work, Career Satisfaction as Motivators

Another way to look at intrinsic and extrinsic motivations is to look at satisfaction in one's life and work; these are very motivating forces for most individuals. Dissatisfaction at one's current job can propel an employee to attempt to become an entrepreneur. One does not have to lose a job to become an entrepreneur, as in necessity entrepreneurship. One can quit a job and become an opportunistic one. If the outcomes of one's work climate are not meeting their needs or are causing excessive amounts of stress and unhappiness, motivation to change those circumstances can flourish. Hence, this serves to motivate or drive opportunity recognition and propels the venture creation process. Of course, corporate downsizing, economic conditions, or other forces outside of one's control can force motivation through the necessity to continue supporting one's self (Elfving 2008), but it is also true that people leave safe and secure employment to become entrepreneurs. This is often because they perceive some other combination of internal and external rewards outside of working for someone else to be more valuable and motivating.

The role of the need for success, power, status, and affiliation (Wainer and Rubin 1967) by entrepreneurs has yet to be fully explored. If entrepreneurship is not viewed positively in a society, it is hard to imagine that entrepreneurs are motivated by power or status in these conditions (Brännback et al. 2007). Could such variables differentiate between entrepreneurs focused on growth-oriented ventures and lifestyle entrepreneurs? Entrepreneurs who set out with a particular vision of their future success can be motivated through the goal of potential future rewards, even though the present work might not be as satisfying or externally rewarding. They may perceive opportunities in very different ways because of their underlying motivations. A longer discussion on perception can be found in another chapter in this book.

13.10.1 Career Motivations

Also related to work satisfaction are the motivational factors related to career motivation. Internal and external forms of motivation are clearly evident in work motivation. Work motivation, as described by Pinder (1984, 1998), is the combination of internal and external factors that initiate work-related behaviors, and determine its form, direction, intensity, and duration (Ambrose and Kulik 1999). For entrepreneurs, it is important that they have a high level of work motivation. While work motivation has been applied to employees and managers, it seems to be lacking in the study of the entrepreneur. The classic work of Hackman and Oldham (1976) on work design has never been applied to how entrepreneurs design their work (or firm), yet it is clear that entrepreneurs are motivated by the kinds of firms they build. It is interesting that entrepreneurship researchers have seemingly avoided the extensive literature on work motivation (Pinder 1984, 1998) which can link to the literature on intentions, goals, goal setting, leadership, and even job enrichment. Recent researchers Gächter and Falk (2000) and Quigley and Tymon (2006) have continued this research stream.

13.11 Goal and Goal Setting

Goals and goal setting are clearly parts of any entrepreneurial activity and often serve as motivators for behavior. It is a critical part of any planned behavior as we will note later in this chapter. Setting and working toward goals is a driving motivational force for entrepreneurs. Improving one's life and the lives of their family members can also be a very motivating goal. In addition, many entrepreneurs self-report that they are motivated to be their own boss and work for themselves instead of being just another face within an organization.

Motivation in relation to goals, however, is not a static state: entrepreneur's motives change throughout their life as their goals change. Something started for one reason may continue for another (Nurmi and Salmela-Aro 2005). The importance and impact of goals has gained a lot of attention in motivational research (see, for example, Locke and Latham 2002; Bagozzi and Warshaw 1990, 1992; Bay and Daniel 2003). In fact, being capable of changing goals and motives is a way for people to adjust to changing situations. As Nuttin (1984) points out, motivation is shaped in the individual–environment context. If environmental factors change, entrepreneurs need to be able to alter their motives in order to cope with and make sense of the new situation (Salmela-Aro et al. 2005).

13.12 Achievement Motivation

One motivational construct that received considerable attention early in the process of understanding the entrepreneur is achievement motivation (Ach) (McClelland et al. 1953; McClelland 1961, 1965; Brockhaus 1980, 1982; Gasse 1982; Carland

et al. 1984; Carsrud et al. 1989), with all studies cited here finding varying results. Interestingly, it was Carland et al. (1984) who said that the small business owner sees their business as an extension of their personality, while the entrepreneur is characterized by innovative business behavior. However, McClelland and Winter (1969) did find that achievement motivation was the differentiating factor between small business entrepreneurs and other business leaders. Recently, there has been renewed interest in this motivational concept (Collins et al. 2004; Langen-Fox and Roth 1995; Tuuanaen 1997; Steward and Roth 2007; Lumpkin and Erdogan 2004; Hart et al. 2007).

One thing that drives that innovative business behavior of the entrepreneur is certainly a motivational characteristic of any successful individual: achievement motivation (Ach). Carsrud et al. (1989) used a multi-dimensional measure of Ach and clearly demonstrated the significant impact of a multi-dimensional measure of Ach on the productivity of a group of retail building supply firms that were started by their owners and ranged from small firms (four employees and revenues of \$550,000) to medium size firms (156 employees and revenues of \$18,000,000). While one could argue these were small business owners and not really innovative growth-oriented entrepreneurs, the fact remains that they all started their firms and their levels of achievement motivation did significantly impact the subsequent success of those firms. It is not that motivations differ between entrepreneurs and non-entrepreneurs, but instead that motivations can impact the resulting performance of the firm, most likely via the intentions and goals of the entrepreneurs.

McClelland (1961, 1965) used a projective technique, thematic apperception test or TAT, and found achievement motivation in men but not in women. Today's entrepreneurship researcher would be hard-pressed to administer the TAT, but if McClelland's findings were true, then there is the issue of why male entrepreneurs have such motivation and female ones do not when we know from common experience that this is not the case. Much of the research problems in the initial measurement of Ach centered on assuming it as a unidimensional concept initially studied via projective clinical techniques. Komives (1972) saw Ach as a lifestyle value quite similar to the conceptualization and measurement process of Mehrabian (1968). It is also important to note that how a concept is operationally measured affects its usefulness in the study of a given phenomenon.

One such approach to a multi-dimensional measure of Ach is the *Work and Family Orientation Inventory* (WOFO) (Helmreich and Spence 1978). It contains three sub-scales that may have particular resonance with the study of entrepreneurship that go beyond the "lifestyle" concerns of the more unidimensional scales of Mehrabian (1968) and Komives (1972). The WOFO sub-scales refer to "mastery needs," "work orientation" (Protestant work ethic), and "interpersonal competitiveness." These dimensions of Ach are assessed through questions such as "I like to work hard" (work orientation), "I prefer to work in situations that require a high level of skill" (mastery needs), and "I feel that winning is important in both work and games" (interpersonal competitiveness). It should be clear from the above questions that these scales are tapping into some underlying motivational characteristics of the entrepreneur. Consider the typical observations about entrepreneurs: they work hard, they have to master any number of different skills and tasks, and they have to

be able to work with others in their team. It should also be obvious that the motivational concept of “mastery” has a great deal in common with the concept of self-efficacy (Krueger et al. 2000; Bandura and Locke 2003; Zhao et al. 2005; Wong et al. 2006). For more on self-efficacy, one is referred to the cluster of chapters on intentions and the chapter on self-efficacy in this book.

A series of studies (Spence and Helmreich 1978; Helmreich and Spence 1978; Helmreich et al. 1978, 1980, 1986; Helmreich 1982; Carsrud et al. 1982, 1989) demonstrated that the quality and quantity of academic and vocational performance can be significantly predicted by varying combinations of multi-dimensional factors of Ach as measured by the WOFO. These studies indicate that the best performance is typically exhibited by those individuals scoring *high* in mastery needs and work orientation, but *low* in interpersonal competitiveness. This combination of factors could also be used to describe self-efficacy. These vocational situations, including entrepreneurial ventures (Carsrud et al. 1989), are ones in which having to interact and motivate others is a necessity. Interpersonal competitiveness, which may be popularly considered a trait of entrepreneurs and Type A personalities, is in fact not a trait of those that are successful (Carsrud et al. 1989).

Finally, if it is correct that McClelland and Winter (1969) found Ach to be a differentiating factor between small business owners and entrepreneurs, such a result could be the outcome of the differences in the interactions of “mastery,” “work orientation,” and “mastery needs,” rather than the presence or absence of overall Ach. This might also explain the observed Ach differences between men and women found by McClelland using the TAT.

13.13 Personality Factors and Motivation

Given that we all have basic, primal motivation, let us consider the influence of specific personality types on how that motivation is cultivated.

13.13.1 *Type A and Type B Personalities*

In psychological research, personality types can be classified into two subgroups: Type A and Type B. People with Type A personalities tend to be extremely driven, focused, high-strung, and goal-orientated. Type A's are characterized as excessive and competitive, with a strong sense of urgency. Additionally, they are seen as possessing a sustained drive for success, a willingness to compete, and habitual actions associated with mental and physical functions (Liao and Welsch 2004). Price (1982) suggested that this is a learned set of behaviors and is more likely in competitive and open economies where success is a function of individual effort and progress is seen in tangible forms.

Individuals with Type B personalities are more laid back and easygoing. Little research has examined whether individuals with certain types of personalities end

up forming different types of firms. For example, do Type A's develop technology firms while Type B's build lifestyle ventures? Likewise, there is research to show differences in optimism versus pessimism in entrepreneurs (Manove 2000), which might be beneficial in predicting bankruptcy or failures. An additional area of personality traits that remains to be explored is gender-related traits, which have been shown to have "motivational qualities."

13.13.2 Masculinity and Femininity

Another way of looking at personalities is to look at differences between groups of entrepreneurs. While there are going to be motivational differences between men and women, many of these may be associated not with gender per se, but with sex-role orientations that reflect more masculine and feminine behaviors: hence, masculinity and femininity (Spence and Helmreich 1978). These traits show predominance of one gender over the other, but both genders can demonstrate these characteristics.

For example, a positive masculine trait with motivational characteristics is instrumentality—the desire to make things work and understand their operation. A negative masculine trait that has motivational impact is hostility—the desire to dominate through physical action in order to bring harm to another. While both men and women can possess these traits, men tend to show them to a greater degree than women. Certainly instrumentality is a trait one would expect to see in technology-based entrepreneurs, which might explain why even today males outnumber women in engineering professions and subsequently in new technology-based firms.

Positive feminine traits such as expressivity—the desire to be sensitive to others and their feelings and to be sensitive to one's own feelings have positive implications for marketing. Being able to listen to what customers need, want, and fear may be far easier for women than it is for men. However, a negative side of femininity, which has motivational implications, is verbal aggression. This tenacity to be aggressive verbally toward others can have significant impact on both organizational performance as well as staff morale within new ventures. Again, while both men and women can possess these traits, women tend to show them to a greater degree than men.

13.14 Motivations, Attitudes, and Behaviors

We know that in order to understand people's behavior, we have to understand their cognitive processes and their perceptions of the particular behavior or act. Accordingly, people make decisions to undergo a certain act, such as becoming an entrepreneur. While cognitive processes involves beliefs, desires, intentions, and

motives, Perwin (2003) argues that special attention needs to be paid to the motives themselves or any underlying motivations. In an entrepreneurial context, it is assumed that people form intentions to perform an entrepreneurial act when they possess positive attitudes toward that very act, i.e., entrepreneurship. Why do these attitudes emerge and how do they subsequently affect behavior?

13.14.1 The Impact of Motivation on Behavior

According to Nuttin (1984), there are three phases in every behavioral process. These are (i) the construction of a behavioral world, (ii) processing of the person's needs into goals and plans, and (iii) carrying out the behavioral operations needed in order to reach the goal or fulfill the plan. The first phase has to do with the situation in which the individual finds himself.¹ Before he can do anything, he starts by processing the informational data into a meaningful picture. In the second phase, he decides what he wants to do, i.e., which goal to reach, and in the third phase he executes his plans. From the point of view of understanding human behavior, we have to understand how people perceive a certain situation and what goals they set.

Nuttin also argues that motives are what take people from one phase to another. Nuttin (1984, 14) defines motivation as “the dynamic and directional (i.e., selective and preferential) aspect of behavior. It is motivation that, in the final analysis, is responsible for the fact that a particular behavior moves toward on category of objects rather than another.” Here motives and motivation are used synonymously.

13.15 Goal-Directed Behavior, Motivation, and Intentions

Goals can be seen as mental representations, or schemes, of what the future could be like, enabling people not to give up (Perwin 2003). As previously mentioned, goals are central units in Bandura's social cognitive theory. According to Bandura, self-efficacy partly determines what people intend to achieve and what kind of goal they set for themselves (Bandura 1989). Goals activate people and in that way often serve as the important link between intention and action (Perwin 2003; Nuttin 1984). This indicates that goals play a role in predicting human behavior. In fact, the importance of goals when studying human behavior has been considered so important that it has led to its own field of research: the *theory of goal setting* (see, for example, Locke and Latham 2002; Latham and Locke 1991; Locke et al. 1988; Baum et al. 2001; Baum and Locke 2004; Shane et al. 2003).

¹Throughout this chapter the authors have chosen to use the pronoun he when referring to an individual, but this has been only for ease of reading and in no way implies that women cannot be entrepreneurs

Locke and Latham (2002) propose that goals impact both performance and behavior through four different mechanisms. First of all, goals have a directive function. They help us to turn our attention and efforts toward activities relevant to the goal and ignore activities which are irrelevant. Second, goals serve as energizers. The higher the goals, the greater efforts we make to achieve them, as stated in Bandura's (1989) theory of self-efficacy. Third, goals affect persistence. The higher the goal, the longer we are willing to work for it. Finally, goals can lead to arousal, discovery, and emergence of strategies. The relationship between goals and performance is stronger the more committed people are. How committed individuals are depends on the importance of the outcome (how important is it to succeed) and how likely their success is in their own estimation (self-efficacy). The existence of feedback is another important factor in goal theory. People need to be able to check where they stand in relation to their goal so that they can determine whether they need to make adjustments in their behavior in order to attain the goal (Locke and Latham 2002; Lent et al. 1994). Social cognitive theory implies there is a reciprocal relation between self-efficacy, outcome expectations, and goal systems (Bandura 1986).

Behavior goals are neither entirely ignored nor explicitly included in the work of Ajzen and Fishbein (1977). Essentially, all behaviors can be labeled as goals in the theory of planned behavior. Goals can be defined as every positive outcome that one seeks to gain through reasoned behavior (e.g., Ajzen and Fishbein 1977). For example, if an entrepreneur goes to venture capitalists in order to raise funds, the act of going to the venture capitalist constitutes a planned behavior and gaining money for the venture is the goal. However, Bagozzi and Warshaw (1990, 1992) have opposed this definition of goals and claim the theory of planned behavior is designed to explain only performances which are solely dependent on an intention, i.e., volitional behavior where no impediments prevent the implementation of the intention. Thus, in effect, ignoring the fact that impediments may have an effect on whether the performance will be successful or not. For example, one may have the intention to buy a business, but the intention may not be acted upon because of a lack of financing or a lack of suitable firms for sale. An intention does not always lead directly to an action (Bagozzi and Warshaw 1990). As noted earlier, Ajzen (1985) did add behavioral control into the model in order to include the influence of external factors, but this addition did not satisfy Bagozzi and Warshaw, who subsequently developed their own model called the *theory of trying* (Bagozzi and Warshaw 1990). This model is illustrated in Fig. 13.1.

While Ajzen and Fishbein's theories treat action as a single performance, Bagozzi (1992) preferred to view action as an attempt, or a sequence of attempts, through which to achieve a final performance. Bagozzi made a critical remark with respect to the nature of entrepreneurial venture creation: *Sometimes there is a significant time-lag between when the decision is made and an opportunity to act on it* (Bagozzi et al. 2003; Shane 2008). This was emphasized by using the words "goal striving" or "trying."

Bagozzi and Warshaw (1990) distinguish between *intermediate goals* and *end-state goals*. For example, one might buy a house (intermediate goal) in order to achieve a higher standard of living (end-state goal). Applying the theory of planned

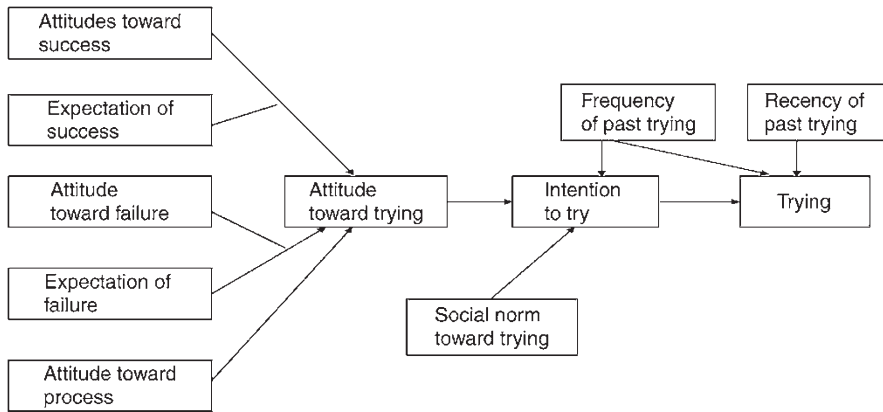


Fig. 13.1 Theory of trying (Source: Bagozzi and Warshaw 1990, 131)

behavior might be useful when deciding which house to buy, but the theory of planned behavior fails to predict whether the end-state goal is achieved or not.

In the theory of trying, an attitude toward a reasoned action is replaced by an *attitude toward trying* and an intention is restricted to an *intention to try*. Moreover, Bagozzi and Warshaw (1990) added the impact of past behavior and some additional background factors. In the theory of planned behavior, intentions and performance are influenced by past behavior only through background factors (Ajzen and Madden 1986; Ajzen and Fishbein 2005). However, Bagozzi and Warshaw (1990) argued that past behavior could make a substantial contribution to understanding future behavior and could also possibly influence behavior directly without impacting the formation of intention. Frequently occurring behavior is often mindless and therefore its performance is determined by cognitive schemes.

In the theory of trying, the impact of past behavior is divided into the *frequency of past behavior* and how *recently that past behavior occurred*, representing the role of memories in affecting future intentions. The frequency of past behavior is assumed to impact the *intention to try* as well as the *trying directly*. It is also believed to impact the intention to try even when intentions are not yet fully formed on a cognitive level. Consider, for example, asking an entrepreneur if he is going to attend a trade fair within the next year. Perhaps he has not yet planned which trade fair to attend, but if he knows that he usually attends two trade fairs each year, he is most likely to answer that he will probably attend one within the next year even though he does not yet have a clear plan which trade fair to attend. The frequency of past trying affects trying directly as in habitual behavior. Moreover, how recent the past trying occurred is also believed to have an impact because of the increased likelihood of recalling and reporting more recent behavior rather than behavior which happened in the more distant past. Recent behavior is therefore assumed to be overweighed in the formation of an intention. For example, if one has just succeeded in starting a company, one is likely to believe one can do it again. Likewise, if one has just failed in something, one is probably not very keen to try again immediately (Bagozzi and Warshaw 1990).

The determinants of attitudes toward trying in the theory of trying are adapted from Lewin’s early work on goals (Lewin et al. 1944). Lewin suggests attitudes toward trying were the result of an individual weighing success against failure. In the theory of trying, self-efficacy is present through the subject’s subjective assessments of the probability of success (Bay and Daniel 2003).

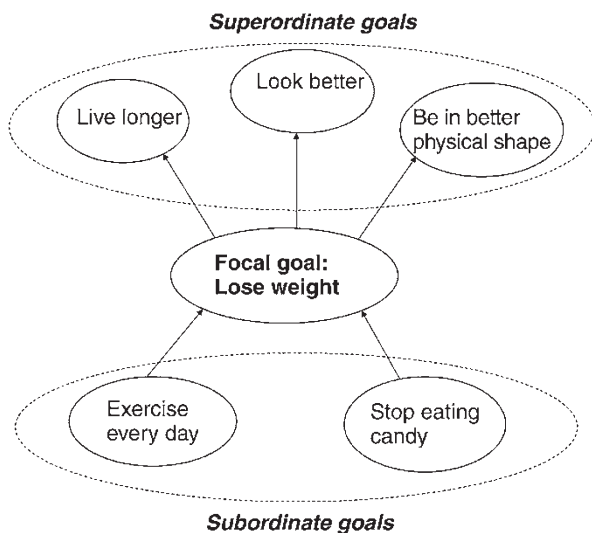
In the original test of the theory of trying, attitudes were not significantly predicted by the attitudes toward failure and the expectations of failure. Later work proved the usefulness of the model, but concurrently draws attention to the fact that the significance of the attitude variables fluctuates (see, for example, Bagozzi and Kimmel 1995; Bagozzi et al. 1992; DeHart and Birkimer 1997). Both Bagozzi and Dholakia (1999) and Bay and Daniel (2003) picked up on this shortcoming and introduced *the concept of the hierarchy of goals*, which should be used in addition to the theory of trying. Bay and Daniel (2003, 669) state

Individuals develop “programs” intended to implement their principles and life goals. Within these programs, goals are arranged in a hierarchical order depending on how close they are to the overall goal of the program. Lower-level goals are intended to set the stage for the achievement of higher level-goals.

As seen in Fig. 13.2, Bagozzi and Dholakia (1999) suggest that goals can be divided into three levels: focal goals, lower level subordinate goals, and higher level superordinate goals. The focal goal is located in the center of the hierarchy and answers the question “What is it that I strive for?” Lower level subordinate goals answer the question “How can I achieve what I strive for?” and higher level superordinate goals answer to the question “Why do I want to achieve what I strive for?”

Most empirical tests of the theory of trying are carried out on a fairly low level of goals, such as losing weight or mastering a new piece of software. Bay and Daniel (2003) wanted to show that if the goal is of a higher level, it may have a different

Fig. 13.2 Hierarchy of goals (Source: adapted from Bagozzi and Dholakia 1999, 24)



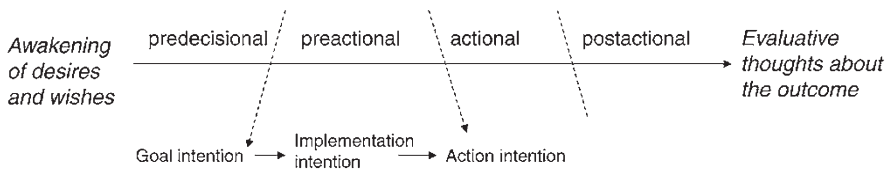


Fig. 13.3 Goal intentions and implementation intentions (Source: adapted from Gollwitzer and Brandstätter 1997)

impact on behavior. It is clear that this theory has much to offer the study of entrepreneurship, which is consistent with Locke and Latham's remark on the importance of the goal and the commitment of the actor (Locke and Latham 2002). It is fair to assume, for example, that one relates differently to purchasing an ice cream cone than to finding one's life partner. To test their assumption, Bay and Daniel (2003) choose to study the decision of high school students to complete their education. In that study, both the attitude toward success and the attitude toward failure were significant predictors of the attitude toward trying. As noted earlier, the attitude toward failure had rarely been found significant in earlier tests of the theory of trying. The results supported the assumption that goal-directed behavior can be placed on a continuum and that goals affect behavior differently depending on their position in the hierarchy.

The idea of a hierarchy of goals is also found in the work of Lawson (1997a, b). Similar to Bagozzi and Dholakia (1999), he proposes that goals can be organized at three different levels: system, principle, and program. The system level is the highest level and reflects the idealized self but does not lead to direct action. The principle level reflects a harmonious life and although it too does not lead to direct action, an understanding is formed at this level of what action could be taken. Finally, the program level results in action. At the two highest levels intentions are still ill-formed. Only at the lowest level (the program level) are well-formed intentions incorporated (Lawson 1997a, b).

The work of Gollwitzer and Brandstätter (1997) contributes to the discussion by illustrating the link between intentions, motivation, and goals and by presenting the ideas of *implementation intentions* and *goal pursuit*. As seen in Fig. 13.3, they describe people's goal pursuits as a continuum including four action phases. The first phase, the *predecisional phase*, is an awakening of desires and wishes. In the second phase, the *preactional phase*, goal-directed behavior is initiated. In the third phase, the *actional phase*, the goal-directed actions are brought to a successful ending. Finally, in the fourth phase, the *postactional phase*, the outcome is evaluated by comparing what has been achieved to what was originally desired.

The four action phases are connected through crucial transition points. Gollwitzer and Brandstätter (1997) label the first transition point *goal intention*. A goal intention, for example, can be "I intend to become an entrepreneur." However, as was previously stated, an intention is not enough to lead to an action as there might be several impediments along the way. There may also be different ways of achieving the goal that one may have to choose between in order to avoid the risk of failing to seize a specific opportunity. An *implementation intention* can then function as a mediator and take the goal pursuit one step further. It serves to translate the goal

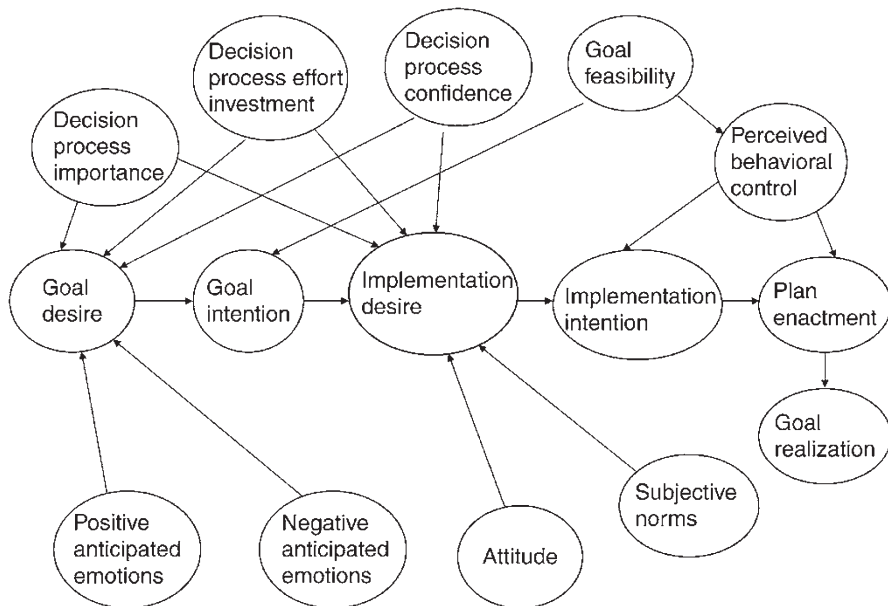


Fig. 13.4 Model for effortful decision making and enactment (Source: Bagozzi et al. 2003, 276)

state from a higher level of abstractness to a lower level and to link a certain goal-directed behavior to a situational context. An implementation intention could be, for example, “I intend to start my own company when I have finished my studies.” An implementation intention results in a commitment to perform a specified goal-directed behavior once a critical situation has occurred. Furthermore, people who have formed an implementation intention should possess the cognitive structures needed to recognize opportunities when they emerge. Thus, Gollwitzer and Brandstätter (1997) conclude that a goal is more likely to be achieved if an implementation intention exists. Gollwitzer and Brandstätter (1997) also succinctly mention the connections to Ajzen’s theory of planned behavior and imply that the theory of planned behavior is a good framework when applying their theoretical ideas. Evidently noticing this suggestion for improvement, Ajzen (2001) emphasizes that translating intentions into action is a complex process which needs more research.

More recently, Bagozzi et al. (2003) have added the implementation intention into their original model (Bagozzi and Warshaw 1992). The resulting model, called a model for effortful decision making and enactment, is designed to explain the mechanisms through which decision making influences goal striving and enactment (see Fig. 13.4).

The model suggests that behavioral decisions are made on two levels. First at the level of goals (or goal intention), and second at the level of the action needed to attain the goal (implementation intention). The mediating role of motivational constructs (goal and implementation desires), emotional constructs (positive and negative anticipated emotions), and attitude constructs (attitudes, social norms, feasibility, confidence, and perceived behavioral control) are also taken into

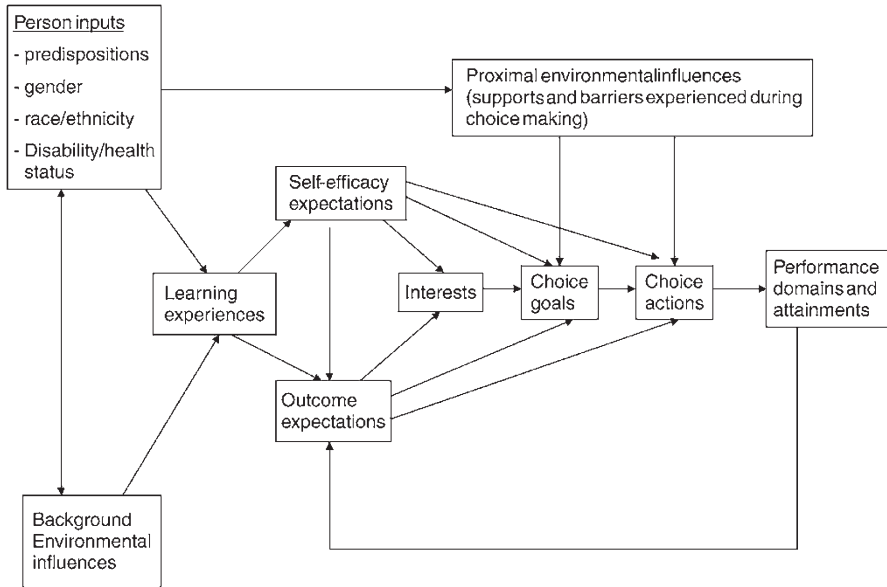


Fig. 13.5 Social cognitive career theory (Source: Lent et al. 1994, 93)

account in the model. Desires are believed to be sufficient antecedents of intentions. Anticipated emotions include the assessment of the prospect of both success and failure. How one feels about succeeding and failing will, according to Bagozzi et al. (2003), affect which goals are set. The role of attitude constructs responds to the arguments presented in the theory of planned behavior.

Since goals impact our decisions and decisions are made frequently in our lives, our chosen goals will influence many aspects of our lives, including career choices. The importance of goals when choosing a career has been studied through social cognitive career theory (Lent and Brown 2006; Lent et al. 1994). The model developed by Lent and Brown and their associates includes variables related to the core person (e.g., self-efficacy, outcome expectation, interest, goals) as well as variables related to the contextual setting (e.g., support, barriers, background). The model is illustrated in Fig. 13.5.

This model implies that people develop a career interest in fields they view themselves to be efficacious in, and in which they anticipate a positive outcome. Personal interests further affects which goal one sets and which actions one chooses to undertake. Outcome expectations and self-efficacy expectations can also directly impact goal and action choices (Lent et al. 1994). *It is noteworthy that there are no obvious dependent variables in the model. Lent and Brown (2006) argued that social cognitive variables can be viewed as dependent or independent, depending on whether one intends to study what shapes the variables, or the outcome that the variables foster.*

	Extrinsic entrepreneurs	Extrinsic & Intrinsic entrepreneurs	Intrinsic entrepreneurs
Motivation	<ul style="list-style-type: none"> - extrinsic motivation - centered around a specific entrepreneurial activity - creativity and result as a motivator 	<ul style="list-style-type: none"> - a mix of intrinsic and extrinsic motivation - centered around the enterprise - independence as a motivator 	<ul style="list-style-type: none"> - intrinsic motivation - centered around the entrepreneur - networking and influencing as a motivator
Cognition	<ul style="list-style-type: none"> - high self-efficacy regarding performing the business activity - unfocused visionary thinking - opportunity recognizers - do not know how to search information - intuition influenced decision making 	<ul style="list-style-type: none"> - high self-efficacy regarding the company and its abilities - focused and analytical thinking - opportunity discoverers - information users - analysis influenced decision making 	<ul style="list-style-type: none"> - high self-efficacy regarding being an entrepreneur - unfocused but innovational thinking - opportunity creators - no time for information search - heuristical decision making
Goals	<ul style="list-style-type: none"> - entrepreneurship is a subordinate goal - lower entrepreneurial goals, mainly focused on surviving - want to be profitable enough to survive 	<ul style="list-style-type: none"> - entrepreneurship is a focal goal - strategical and rational goals - profit focused 	<ul style="list-style-type: none"> - entrepreneurship is a focal goal - high and somewhat abstract goals - being profitable is seen as an interesting challenge

Fig. 13.6 Characteristics of different types of entrepreneurs (Source: Elfving 2008, 144)

13.16 Tying Motivation to Cognitions and Goals

If we take the discussion on intrinsic and extrinsic motivations and merge it into the discussion on goals and cognitions, we can create a description of the characteristics that different types of entrepreneurs have (Elfving 2008). In this chapter, we have attempted to cover a broad range of concepts that have strong motivational properties that could impact entrepreneurial cognitions and behaviors. We have also tried to show how various motivations are tied to entrepreneurial intentions and attitudes, as seen in Fig. 13.6. We have also suggested several potentially fruitful areas of research using motivational concepts that could reveal a lot about what drives entrepreneurs. In turn, this could potentially help us better design programs and policies to support such motivations and subsequent behaviors.

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Chapter 14

Motivations Matter in Entrepreneurial Behavior: Depends on the Context

Jennie Elfving, Malin Brännback, and Alan Carsrud

14.1 Introduction

Since the original chapter on entrepreneurial motivation by Carsrud et al. (2009), we have seen dozens of citations to the work and to a follow-up article (Carsrud and Brännback 2011) in various conference papers and published research articles. We are gratified to see the motivation of entrepreneurs regaining some of the attention of researchers (Shepherd et al. 2015). In this update to the chapter, we are going to focus on some of the work, which we feel has the most promise of influencing the future direction of research on entrepreneurial motivation. We also have discussed motivations in an earlier update in this volume on a contextual model for entrepreneurial intentions. These specifically focused on our views on the role of motivations and goal setting with respect to intentions. In this update, we will expand on that and other issues, which we feel deserve attention.

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14.2 Getting from Intention to Action

As we all know, since the 1990s, many authors including us have studied entrepreneurial intentions as the starting point of the entrepreneurial process. What researchers rarely note is the fact that intentions explain only a quite small percentage of the variances in behavior (Adam and Fayolle 2015). Schlaegel and Koenig (2014) found in their study that only 37 % of all entrepreneurial behavior or actions can be explained by intentions. While this is a significant portion of the variance, clearly 63 % still needs to be explained. What is more telling is this result is no breaking news since Ajzen (1988) 30 years ago concluded that intentions explain about 30 % of the variance in behavior. In other words, when we see people who say they intend to start a venture, why do the vast majority fail to translate that cognition into actual behavior? This was the focus of the chapter in the original volume by Bird and Schjoedt (2009).

For years we, and others, have been studying entrepreneurial intentions and not until now have we begun to realize how little intentions actually tell us about subsequent entrepreneurial behavior or lack thereof. What we intend to do very often differs significantly from what we actually do. Or as Wieber et al. (2015, p. 2) put it: “The road to hell is paved with good intentions.” This intention-behavior gap can be found, not only in entrepreneurship but also in various everyday domains such as intentions to exercise more, eat healthier, or make ethical purchases (Wieber et al. 2015). As a result of this, the main interest for many entrepreneurial intention researchers right now seems to be how to bridge the gap between intention and behavior (Adam and Fayolle 2015; Carsrud and Brännback 2011).

Consequently, researchers are now putting more focus on implementation intentions instead of studying intentions on a general level (Adam and Fayolle 2015; Fayolle et al. 2014). In the process the motivation-behavior linkage has resurfaced via goals. As Gollwitzer and Brandstätter (1997) conclude, a goal is more likely to be achieved if there is not only a goal intention but also an implementation intention. Implementation intentions facilitate the initiation of intended behavior (Adam and Fayolle 2015). Forming an implementation intention means that people plan when, where, and how they want to act toward a goal in an if-then format, e.g., “if I encounter situation Y, then I will initiate action Z” (Wieber et al. 2015). An implementation intention can then function as a mediator and take the goal pursuit one step further. It serves to translate the goal state from a higher level of abstractness to a lower level and to link a certain goal-directed behavior to a situational context. Furthermore, people who have formed an implementation intention should possess the cognitive structures needed to recognize opportunities when they emerge. Implementation intentions have been demonstrated to affect both attentional and memory processes. Implementation intentions “render the mental representation of the situation highly accessible and establish a strong associative link between the mental representation of the situation and the action” (Wieber et al. 2015, p. 1). However, the question about what takes the person from an implementation intention to actually demonstrating behavior still remains largely unanswered. As concluded in

the text from our earlier chapter (Carsrud et al. 2009), motivation could be a part of bridging the gap. As will be shown in this update, other motivational factors have been shown to play a role. For example, in recent years, work has been done on the role of commitments (Fayolle and Liñan 2014), values, and emotions (Cardon et al. 2012). Clearly motivational concepts and their role in the entrepreneurial process have acquired more attention.

14.3 Motivations Could Bridge Many Gaps

Both Carsrud et al. (2009) and Carsrud and Brännback (2011) called for a rediscovery of motivations and the role they play in entrepreneurial behaviors. They demonstrate that the role motivations play in the entrepreneurial process has been discovered only at the margins so far and therefore we still have much more to learn. These writings pay special attention to how motivations impact both intentions and subsequent behaviors and list potential research areas. The under-researched areas include the role of motivation in opportunity recognition, how context impacts motivations, the linking of motivations to behavior, and how motivation impacts firm design. The long list of under-researched areas verifies the need to pay more attention to motivations. To date, if there are researchers working on these areas, much of their work has yet to reach the published literature.

However, there are some examples of where this call has been headed. For example, Adam and Fayolle (2015), Dunkelberg et al. (2013), Tietz and Parker (2012), Solesvik (2013), Wasdani and Mathew (2014), and Yitshaki and Kropp (2015) have picked up on this need. Dunkelberg et al. (2013) point out that given the human diversity, motivations are likely to differ from one entrepreneur to another. Empirical studies conclude that the core motivations for becoming an entrepreneur often include both monetary and nonmonetary goals. However, few studies focus on how entrepreneurs with different motivations also behave differently (Dunkelberg et al. 2013). Not surprisingly, Dunkelberg et al. (2013) demonstrate in their study that entrepreneurs with nonmonetary goals allocate their labor and capital differently than entrepreneurs with monetary goals. Likewise Yitshaki and Kropp (2015) show that commercial entrepreneurs are driven by economic gain or personal goals, whereas social entrepreneurs are driven by social impact and the ability to maximize social good. These motivational differences will also impact their entrepreneurial intentions and subsequent behaviors.

Starting and running a venture is a dynamic process and therefore likely to involve a variety of motivational factors at different stages of the process. As Hechavarria et al. (2012) remark, few studies on entrepreneurial motivation have adapted a process approach. Thus there is a need for a more dynamic, evolutionary perspective on motivations. We don't know much about how entrepreneurial motivation changes throughout the process. It is likely that individuals shift to other types of motivators at some point of the process (Shepherd 2015).

14.4 Commitment

Adam and Fayolle suggest that in order to better understand the intention-action link, we need to assess the intensity of the intentions. In their own words, Adam and Fayolle (2015) complete the work of Brännback and Carsrud (2011) by introducing the concept of commitment. Commitment means devoting ones time, energy, emotions, and physical resources in a certain project (Adam and Fayolle 2015). Fayolle and Liñan (2014) suggest commitment could be the missing link between intention and behavior in the field of entrepreneurship. What they suggest is that the more committed the person is, the more likely he or she is to take action. Adam and Fayolle (2015) propose implementation intention and commitment to be viewed as moderators of the entrepreneurial intention-behavior relationship. Commitment is close to the concept of motivation, but according to them, nonetheless, a different concept. Adam and Fayolle (2015) claim motivations can be considered as a triggering factor, but once the conditions for the individuals' motivations vanish, commitment then takes over. Commitment is what helps entrepreneurs stick to their goal, even if motivation is at stake, and that is why Adam and Fayolle (2015) choose to focus on commitment rather than on motivations to bridge the gap between intention and behavior. They propose that by exploring the commitment profiles of entrepreneurs and how they differ at different phases of the process, we would get a better understanding of the entrepreneurial process.

The question is whether commitment and motivation really should be reviewed as two different concepts. According to Solesvik (2013), entrepreneurial motivation is a multifaceted concept that can be divided into general motivations (need for achievement, locus of control, vision, passion, etc.) and task-specific motivations (including goal setting and self-efficacy). Based on this, we advocated that commitment is but one form of motivation and its impact will likely to affect the process and vary throughout the process. Now let us turn to another term that is often associated with motivation, the concept of emotions.

14.5 Emotions and Passions

In recent years, numerous scholars have started to challenge the assumption about rational decision making in a number of areas including strategy, management, and entrepreneurship. The first step was to investigate the role of cognitive biases, and in more recent research, scholars have moved on to study the impact of emotions. The environment, in which the entrepreneur acts, is often unpredictable and uncertain. In such circumstances emotions can determine specific actions or decision effects (Grichnik et al. 2010). It has also been argued that emotion-related factors impact entrepreneurial motivation. It is often difficult to separate thoughts from feelings, i.e., cognition is linked to emotions. Individuals tend to use feelings to

decide on a course of action, but then use logic to subsequently support their actions. The feedback loop among emotions, cognitions, and intentions has not yet been studied to an appropriate extent (Foo 2001). Drnovsek et al. (2009) and Cardon et al. (2012) suggest entrepreneurial passion can add to our understanding of entrepreneurial dynamics. Passion has been associated with the ability to foster creativity, identify opportunities, and fuel motivation. Moreover, passion is likely to play a critical role in fostering increased efforts and persistence toward goals despite significant obstacles. But here again, we need to discuss whether passion should be viewed as one variety of motivation or as a completely separate concept. There remains much to do in the area of passion as a motivational factor. So what do we feel really needs examination, the area of goals as it ties commitment, passion, emotions, and intentions all together.

14.6 It Comes Down to Goals

While we strongly believe that goals are critical for understanding entrepreneurial behaviors, we are the first to admit that goals themselves are not enough to generate entrepreneurial action. Individuals must have the ability to attain their goals and believe in their own ability. Therefore, self-efficacy influences an individual's level of motivation, as reflected in how much effort he or she will exert in an endeavor. People with high self-efficacy recover more quickly from setbacks and are in the end more likely to achieve their goals. When people start a business, they typically have numerous sets of goals they seek to accomplish. These goals may vary from individual to individual, but in general have been shown that specific and more difficult goals lead to higher performance than vague and easier goals (Hechavarria et al. 2012).

As we stated in the original chapter, entrepreneurial motivations will impact entrepreneurial goal setting. People with intrinsic motivations set different goals than people with extrinsic goals (Elfving 2008). Bagozzi and Dholakia (1999) suggest that goals can be divided into three levels: focal goal, lower-level subordinate goals, and higher-level superordinate goals. The focal goal is located in the center of the hierarchy and answers the question "What is it that I strive for?" Lower-level subordinate goals answer the question "How can I achieve what I strive for?" and higher-level superordinate goals answer to the question "Why do I want to achieve what I strive for?" Superordinate goals are close to what many people consider motivations. Starting a business can be either a focal goal or a subordinate goal and in some cases perhaps even a superordinate goal. It is fair to assume that the higher up in the hierarchy the goal is, the more committed the person will be to reach the goal, and the more emotions will be involved.

To date we have very few recent studies on how motivation is linked to goal hierarchy in an entrepreneurial context. This would seem to be a very fruitful area that largely has been ignored. One exception is a study by Carland et al. (2015) where behavioral differences among entrepreneurs are presented and examined in

the light of Maslow's hierarchy of needs. In this study, the researcher shows that respondents who display higher entrepreneurial drive view their businesses as vehicles for achieving self-esteem and self-actualization, whereas those respondents who display lower entrepreneurial drive view their firms as vehicles for providing basic financial needs.

14.7 Conclusions

Despite the lack of an enormous increase in research on entrepreneurial motivation, the current research supports the assumption that motivation plays a central role in the entrepreneurial process. From the available research, we have also been able to identify different kinds of motivations and concluded that motivation is person specific and therefore different entrepreneurs have different motivations. This motivation is contextual to the individual. We concur with Hechavarría et al. (2012) that there is a need for a more dynamic, evolutionary perspective on motivations. This, however, will require moving from single snapshot approaches to looking at behaviors over time.

What we are suggesting is that future research should focus on how motivation changes during the course of the process and how a person's hierarchy of goals impacts entrepreneurial motivations. Also we need to further examine how commitment and passion are likely to be connected to hierarchy of goals. The higher up in the hierarchy the goal is, the more passionate and committed is the person. We thereby agree with Adam and Fayolle (2015) in that commitment is important, but we claim it is not a choice between studying commitment and motivation. Instead we argue both features are needed in order to understand the entrepreneurial process. We claim that motivation is what spurs the process and the type of motivation will determine how high up in the hierarchy of goals the entrepreneurial endeavor will be placed. The position in the goal hierarchy will regulate commitment, and commitment will impact how hard the person is willing to work in order to accomplish the goal. Commitment is like a rope (or linkage) that ties motivation (and intention) to goals (and action). The higher up in the hierarchy of goal the entrepreneurial endeavor is, the stronger the linkage between intention and action will be. A stronger rope will last longer than a weak one. Likewise a stronger commitment will accomplish more than a weak one. In one end of the rope, we can find motivations and intentions, and in the other end, we can find goals and actions.

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Chapter 15

The Role of Emotions and Cognitions in Entrepreneurial Decision-Making

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15.1 Theoretical Foundations

This chapter examines the role of emotions and cognitions in entrepreneurial decision-making and how they interact in this process. First, definitions of the terms emotions and cognitions are outlined. Second, entrepreneurial decision-making processes and the role of emotions and cognitions within these processes are presented. Afterward, we briefly describe three representatives of cognitive appraisal theories of emotion with the focus on entrepreneurship. Finally, we present a model of how to study emotions and cognitions in entrepreneurial decision-making and point out implications for future research, for practice, and for teaching.

15.1.1 Emotions

The term “emotion” can be traced back to the Latin words *e(x)* (out/out of) and *motio* (movement/action/excitement), thus indicating that some (inner) movement or excitement is being transported out of an individual inner state to the public.

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Emotions in business contexts have been ignored for a long time. However, studies in psychology, humanities, and social sciences assign an important role to emotions in human behavior. Because neuroscience can now specify the physiological correlates of emotional activities and is able to explicitly connect them with decision-making (e.g., Cohen 2005; Phelps 2006), emotions are increasingly integrated into research on decision-making processes and behavior in business contexts (cf. Côté 2005; Côté and Morgan 2002; Fisher and Ashkanasy 2000). The field of neuroeconomics investigates research on emotions in decision-making by linking neuroscience and economics and opens the “black box” of decision-making (e.g., Camerer et al. 2004; Lieberman 2007; Shiv et al. 2005).

Since William James (1884)¹ answers to the question of “what is an emotion” has been vehemently discussed, but although there is a large body of literature, it fails to provide one undisputed definition. Scherer (2005) calls the counting of definitions of emotion “hopeless”. The large amount of different conceptualizations of emotion can be explained by differing underlying theoretical frameworks and thus accentuating or devaluating different aspects of an emotion. Componential theories of emotion describe emotions’ main components and propose that emotions have the following attributes in common (e.g., Meyer et al. 2001, cf. Försterling and Spörrle 2005):

- Emotions are current psychological states of an individual and have a certain quality (positive emotion, e.g., happiness, or negative emotion, e.g., sadness), intensity (e.g., strong fear or weak fear), and duration (e.g., short-term fear or long-term fear).
- Emotions focus on certain targets and usually an individual can name the object why he/she is, for example, happy or sad.
- Emotions are typically (consciously) experienced by the individual (experience aspect).
- Emotions reveal psychological changes, e.g., flushing, increased heartbeat frequency (psychological aspect), which are connected with certain behavior tendencies, e.g., running away with fear, showing your teeth because of anger (behavioral aspect).

Discrete emotion theories (e.g., Scherer 2005; Ekman 1972, 1992) suggest a number of basic emotions such as joy, love, anger, fear, sadness, disgust, and surprise. Scherer (2005), for example, proposes anger, fear, joy, and sadness as typical basic emotions that are frequently experienced. Following the Geneva Emotion Wheel (GEW, see references) in Fig. 15.1, pride, elation, happiness, satisfaction, relief, hope, interest, surprise, anxiety, sadness, boredom, shame/guilt, disgust, contempt, hostility, and anger can be added to these emotions (cf. Scherer 2005). The 16 emotions in the GEW—the upper limit of amount of basic emotions is often considered as 14 (Scherer 2005)—are divided into four emotions per quadrant. The intensity of the emotions is represented by the size of the circle, with small circles representing weak emotional intensity, e.g., weak fear, and large circles representing strong emotional intensity,

¹Scherer (2005) criticizes that William James (1884) asked the wrong question with “what is an emotion,” but should have rather asked “what is a feeling.”

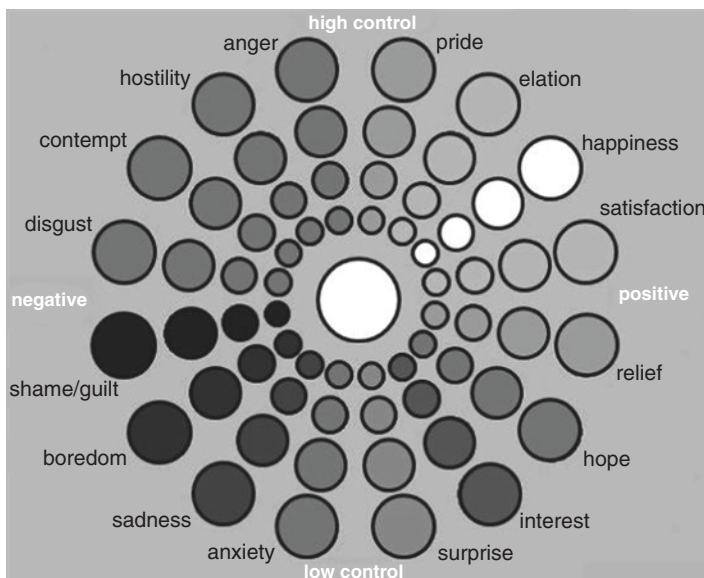


Fig. 15.1 Prototype version of the Geneva Emotion Wheel

e.g., strong fear. Additionally, there are negative or positive emotions and high controllable or low controllable causes for emotions. If an outcome is (not) congruent with the goals of an individual and the cause for that outcome was controlled by that individual, the individual will show (anxiety) pride about this outcome. If an outcome is (not) congruent with the goals of an individual and the cause for that outcome was not controlled by that individual, the individual will show (sadness) surprise about that outcome. For example, when entrepreneurs (do not) receive profit from an investment decision, they will feel (angry) proud, if they appraise this decision (i.e., the cause for the outcome) as controlled by themselves. On the other hand, when entrepreneurs (do not) receive profit from an investment decision, because the profit depends on an unexpected economic boost (crisis), they will feel (sad) surprised.

15.1.2 The Difference Between Emotion, Affect, Mood, and Feeling

As mentioned above, emotions are directed on a certain object and they are timely limited. Mood and affect describe a milder experience, do not necessarily have a clear reason (i.e., stimulus) and are longer lasting. Feelings are the conscious subjective experience of emotion and mood (Barsade and Gibson 2007; Meyer et al. 2001). Baron (2008) defines affect as individuals' current moods and feelings.

In the following we use emotion as a general term, because as far as it concerns the current status of entrepreneurial research emotions, affects, moods, and feelings

to some extent produce comparable effects in decision-making (e.g., Baron 2008; Lyubomirsky et al. 2005).

15.2 Cognitions

The term “cognition” derives from the Latin word *cognoscere* (to recognize/to discover).

Cognitions in general are all processes by which sensory input is transformed, reduced, elaborated, stored, recovered, and used (Neisser 1967). Thus, entrepreneurial cognition can be seen as the cognitive process through which entrepreneurs acquire, store, transform, and use information (e.g., Busenitz and Arthurs 2007; Mitchell et al. 2004; Sternberg 2004). Additionally, Mitchell et al. (2002) propose a definition of entrepreneurial cognitions:

Entrepreneurial cognitions are the knowledge structures that people use to make assessments, judgments, or decisions involving opportunity evaluation, venture creation, and growth. (Mitchell et al. 2002, p. 97)

Some of the problematic aspects of entrepreneurial cognitions, such as counterfactual thinking and affect-infusion (cf. Forgas 1995), self-serving bias, planning fallacy, and self-justification (Baron 1998), overconfidence and representativeness error (Busenitz and Barney 1997), illusion of control, and misguided belief in the law of small numbers (Simon et al. 2000), however, occur in entrepreneurial environments characterized by high uncertainty or novelty, information overload, strong emotions, time pressure, and fatigue (cf. Mitchell et al. 2002; Picot et al. 2005, 2008). On the other hand, positive aspects of entrepreneurial cognitions are, for example, making an entrepreneurial decision based on cognitive mechanisms such as expert scripts (Mitchell et al. 2000 and Chaps. 9 and 11).

Because the creation of a new business venture is, fundamentally, a social activity, some researchers (cf. Mitchell et al. 2002; Shaver and Scott 1991) are concentrating on the process of social cognition which beyond others also includes aspects of attention, memory, categorization, and inference. Originally, there are two aspects of social cognition (Fiske and Taylor 1984), one being the person in the situation, and the other one being cognition and motivation (see also Chap. 13). A recent definition of social cognition is provided by Baron et al. (2009) as the ways in which individuals interpret, analyze, remember, and use information about the social world.

15.3 Emotions and Cognitions in Entrepreneurial Decision-Making

In this section, we demonstrate the influence of emotions and cognitions on entrepreneurial decision-making and how emotions and cognitions interact in this process. Although we first outline the influence of emotions and cognitions on entrepreneurial

decision-making separately, researchers and practitioners have already agreed that emotions and cognitions cannot be studied without each other. Only for reasons of clarity do we focus on the influence of emotions on entrepreneurial decision-making and then on the influence of cognitions on entrepreneurial decision-making before we show their interacting effects on entrepreneurial decision-making. Previous studies on the connection between emotions and cognitions (e.g., Forgas 2000) indicated that they are connected in a bi-directional link, i.e., emotions affect cognitions and cognitions in turn influence emotions (Baron 2008).

15.3.1 The Role of Emotions in Entrepreneurial Decision-Making

Emotions in the entrepreneurial process have not been examined by many scholars so far (e.g., Cardon et al. 2005; Goss 2005, 2007; Shepherd 2004), but in entrepreneurship literature they are often connected to information processing and decision-making (e.g., Baron 2000a; Goss 2007; Schindehutte et al. 2006). Because entrepreneurs have specific tasks in highly unpredictable, uncertain, and rapidly changing environments (Picot et al. 2005), they cannot follow certain well-learned scripts. Instead, they often have to trust their “gut feeling” which under such circumstances are especially strong (Baron 2008). Emotions, however, influence the decision-making process and judgments, even when they are unrelated to each other and stem from sources completely independent of the context (Baron 2008). But considering the fact that individuals are able to control or suppress their positive and negative emotions, some studies (e.g., Shiv et al. 2005; Spencer 2005) proved that those individuals, who make decisions (seemingly) independent of their emotions, are more successful and make more efficient decisions. Besides, Baron (1998, 2000b, 2008) postulates that entrepreneurs will experience very intense emotions in their decisions, as they generally show a high commitment to their ventures.

The following two sections outline possible effects of positive and negative emotions on entrepreneurial decision-making processes. It must be mentioned here that neither negative nor positive emotions have a uniformly beneficial or detrimental effect on entrepreneurial decision-making.

15.3.2 The Effect of Positive Emotions on Entrepreneurial Decision-Making

There are numerous studies which provide evidence for the beneficial effects of individuals with positive emotions and even though it has been postulated that emotion-related conditions such as passion, enthusiasm, and affection provide important impulses in the entrepreneurial process (Baum and Locke 2004; Cardon et al. 2005; Smilor 1997), positive emotions have hardly been considered. Many

studies have proven that positive emotions lead to more efficient decision-making (e.g., Estrada et al. 1997; Isen 2000), higher involvement with tasks (e.g., Lyubomirsky et al. 2005), and approach behavior (e.g., Baron 2000a; Krause 2004 and Chap. 23). Additionally, positive emotions might explain why some entrepreneurs are able to tolerate intense levels of stress (Baron 2008) and could therefore be more successful than other entrepreneurs not holding this external pressure.

Some studies (e.g., Ardichvili et al. 2003; Baron 2004, 2008; Forgas 2000) also demonstrated negative effects of positive emotions and showed that positive emotions such as joviality and happiness might lead entrepreneurs to not fully evaluate all possible outcome alternatives and consequently result in hasty and premature decisions. This could happen when entrepreneurs stop the information search for a decision too early (cf. Bless 2001; Picot et al. 2008), because they are already so enthusiastic about their present idea and believe that they cannot find a better one (e.g., Fiet et al. 2004). It was also shown that positive emotions often increase individuals' willingness to take risks because they feel more optimistic and capable of dealing with potential problems (e.g., Weiss 2002) and expect positive outcomes (e.g., Busenitz and Barney 1997) which increase the tendency to make risky decisions. In addition, there is evidence (e.g., Cacioppo et al. 1993) that entrepreneurs' emotions are contagious, resulting, if the emotions are positive, in being more persuasive for investors, employees, and customers. Positive emotions in this instance could serve for a better success of the new venture. However, it cannot be assumed that positive emotions in general are more helpful for the success of a new venture than are negative emotions.

15.3.3 The Effect of Negative Emotions on Entrepreneurial Decision-Making

Negative emotions such as anxiety and shame do not have an exactly opposing effect compared to positive emotions, but they are rather heterogeneous. Negative emotions have been found to result in avoidance behavior (e.g., Krause 2004; Lazarus et al. 1980), even though some studies also uncovered that negative emotions can have a positive influence on decision-making through higher concentration and more detailed processing (Schwarz et al. 1991). But negative emotions could make entrepreneurs also more risk averse so that they only make decisions when the option is evaluated as totally safe in order to minimize risks and negative outcomes. Higgins (2005) and Brockner et al. (2004) call this a "prevention focus," preventing entrepreneurs from engaging in entrepreneurial action although it could be beneficial. Negative emotions might also be contagious and lead to little support from the social network, e.g., investors, customers, employees (Baron 2008). Little or no support from the social network because of negative emotions might also negatively influence the success of a new venture because extensive social networks are seen as a critical success factor (e.g., Birley 1985; de Koning 1999; Low and McMillan 1988; Ozgen and Baron 2007). Shepherd (2003, 2004) examined negative emotions connected with business failure

and could show that potential entrepreneurs are more discouraged by fear of failure than that they are driven by the prospects of great success.

15.3.4 The Role of Cognitions in Entrepreneurial Decision-Making

All inner processes associated with entrepreneurial activity are at least partly cognitive processes. Therefore, one might argue that entrepreneurial activity is influenced by cognitive biases, and cognitive biases were indeed found to strongly influence entrepreneurial decision-making (e.g., Baron 2004; Busenitz and Barney 1997; Shaver and Scott 1991). Baron (2004) even proposes that especially entrepreneurs are more susceptible to such biases than other persons.

In general, individuals have a strong tendency to weigh negative information more heavily than positive information (negativity bias, e.g., Mitchell et al. 2002; Picot et al. 2008). Additionally, individuals tend to notice information that is connected to information they already know (e.g., von Hippel 2004). This strongly influences decisions in a wide range of contexts, especially in the decision-making context of entrepreneurship. The so-called optimistic bias describes an individual's tendency to expect positive outcomes and events (e.g., Busenitz and Barney 1997; Simon et al. 2000) and also influences evaluation and exploitation processes. A derivative of the optimistic bias is the planning fallacy which involves individuals' tendencies to assume that they can achieve more than they actually can during a specific period of time, or that they can complete tasks sooner than is actually practicable (e.g., Bühler et al. 1994). If that is not the case and the tasks take longer than planned to complete, it may lead to the dissatisfaction of investors, customers, and other stakeholders. Finally, the confirmation bias influences individuals' decision-making processes. The confirmation bias refers to the tendency to seek, notice, and remember information that confirms current preferences or beliefs and to overlook and ignore information that is not consistent with current preferences or beliefs (e.g., Nickerson 1998; Picot et al. 2008). This might seriously interfere with the perception and evaluation process of information that could be necessary for the success of the new business. The affect infusion model (Forgas 1995) assumes that the strength of emotion affects individuals' judgments, but interestingly, that does not happen consistently.

Baron and Ensley (2006, Baron 2008) compared one cognitive framework that underlies opportunity recognition, namely pattern recognition, of novice and experienced entrepreneurs. Previous literature calls this prototype theory (e.g., Whittlesea 1997) and Hahn and Chater (1997) developed a basis for it with different theories of pattern recognition. It is not surprising that individuals differ in their cognitive frameworks since these are shaped through unique life experiences. In essence, prototypes serve as templates for individuals and seek to notice links between diverse events or trends and to perceive recognizable and meaningful patterns in these linkages (Baron and Ensley 2006). They (Baron and Ensley 2006)

argue that entrepreneurial opportunities have similar characteristics that can be recognized by individuals. Therefore, cognitive frameworks employed by entrepreneurs do indeed develop with increasing experience as theories of pattern recognition suggest (e.g., Whittlesea 1997). Experienced entrepreneurs acquire these well-developed cognitive frameworks through processes of learning—processes that occur as they gain experience in the intricacies of starting a new business.

However, it should certainly not be assumed that the development of increasingly strong and developed prototypes is beneficial in all respects or all instances (cf. Garud and Rappa 1994), e.g., for the success of a new venture.

15.3.5 The Interaction Between Emotions and Cognitions in Entrepreneurial Decision-Making Processes

According to Scherer (2005) some researchers still see emotions and cognitions as two independent but interacting phenomena. However, there is more and more common sense that emotions and cognitions cannot be studied separated from each other, but that only an integrative view will lead to an understanding of their effects on entrepreneurial decision-making. Cognitive science research has proven a strong and complex link between emotions and cognitions (Baron 2008; Tice et al. 2000) and the expanding entrepreneurship literature (e.g., Koellinger et al. 2007; Lee et al. 2005; Shepherd 2004; Sternberg et al. 2007) provides also clear evidence that emotions have a systematic influence on entrepreneurial decision-making. In the last two centuries, three integrative fields of research aroused: the study of the influence of emotions on the memory, on cognitive information processing and attention, and on decision-making (Baron 2008).

The mood-dependent memory is therefore a study subject for the interaction of emotions and cognitions as it perceives, stores, and recalls certain information only in certain moods (Baron 2008; Blaney 1986; Bower 1981; Eich et al. 1994). Individuals primarily remember things they learned in a certain mood when they are in a similar affective state again. For example, entrepreneurs remember sad things when they are in a similar sad situation, and they remember happy things when they are in a similar happy situation. Additionally, if entrepreneurs in negative (positive) moods remember more negative (positive) situations, the current negative (positive) emotional state will be enhanced and entrepreneurs will feel even worse (better). This influences entrepreneurs' decision-making as they only recall selected mood-dependent information on which the decision is based.

As mentioned above, strong positive emotions will result in cognitive strategies for coping and tolerating high levels of stress (Baron 2008; Carver and Scheier 2001). While individuals under weak stress are more concentrated and motivated in their tasks, individuals under strong stress might not be able to “think” anymore—a so-called “black out”—and are unable to explain the simplest relationships. In addition to the influence of the emotions' intensity on cognitions, there

are also indications that the quality of emotions determines how information is processed and stored (Baron 2008).

Emotions also have been found to influence individuals' perceptions of the external world (e.g., Baron 2008; Forgas 1995, 2000), e.g., objects, experiences, people, whereas individuals displaying positive emotions tend to perceive the external world as positive and individuals displaying negative emotions tend to perceive the opposite (Baron 2008). For example, happy entrepreneurs tend to see their situation as positive (what it is not necessarily), whereas sad entrepreneurs tend to see their situation negative. In line with that, entrepreneurs with positive emotions tend to perceive a broader range of stimuli than entrepreneurs with negative emotions (e.g., Isen 2002; Schiffman 2005). Thus, positive emotions enhance individuals' entrepreneurial alertness (e.g., Baron 2008). Positive emotions were also found to enhance creativity (creative cognition) (cf. Isen 1999), an important aspect of entrepreneurial cognitions, as happy individuals show a higher cognitive flexibility, i.e., a wider range of ideas and associations (e.g., Baron 2008; Ward 2004). However, individuals in positive emotions and a higher cognitive flexibility were also found to be easier to distract (e.g., Dreisbach and Goschke 2004). Besides, negative emotions under some circumstances were also found to increase creativity, although not as strong as positive emotions (e.g., Baron 2008).

When individuals experience strong positive or negative emotions their capacity to think systematically and to evaluate information carefully is significantly influenced (Baron and Ensley 2006; Ruder and Bless 2003), e.g., strong emotions increase the tendency to engage in heuristics ("short-cuts") rather than systematic thinking (e.g., Baron 2008, cf. Tversky and Kahneman 1974).² Thus, strong emotions reduce cognitive activity and might lead to serious judgment and decision errors (Baron 2008). Some findings indicated that individuals in positive emotions are more likely to engage in heuristics than individuals in negative moods because they do not want to threaten their positive state through the effort of systematic thinking (e.g., Mackie and Worth 1989; Park and Banaji 2000). Others show that individuals with positive emotions engage more in systematic thinking when clear situational cues require the effort of cognitive activity (e.g., Lyubomirsky et al. 2005). When engaging in heuristic thought, decisions are typically made faster as individuals make this decision based on past decisions. For example, if an entrepreneur made the decision that he or she does not like a certain investor, he or she might make the same decision after 1 year again. The second decision is a "short-cut" as it refers to a decision already made in the past without further considering emotions. Thus, if we think that we make the most rational decisions, because we take our

²In the early 1970s, Tversky and Kahneman described a research orientation which has dominated the judgement and decision-making literature ever since. They argued that individuals make use of cognitive heuristics, i.e., simple rules of thumb to make "quick-and-easy" decisions, which reduce the complexity of a decision under uncertainty. Heuristics in general, however, are quite useful, but sometimes they also lead to serious and systematic errors, i.e., cognitive biases. Tversky and Kahneman defined three cognitive heuristics for risk judgments, namely representativeness, availability, and anchoring-and-adjustment.

time to collect and evaluate information, emotions are most likely to influence our decisions in that process (cf. Baron 2008).

Additionally, individuals in a positive mood are more likely to judge a statement as true compared to individuals in a negative mood (Garcia-Marques et al. 2004). Besides, there is a decision-making strategy called “satisficing” (e.g., Baron 2008), which occurs when entrepreneurs choose the first best alternative. This strategy is particularly applied when entrepreneurs experience positive emotions and it results in fast and quite efficient decisions. There is a strategy mostly applied in negative emotions called “maximizing” (e.g., Baron 2008) with which entrepreneurs evaluate exhaustively any possible alternative.

In the following section, we present three cognitive appraisal theories of emotion. These theories are best suitable for future research on entrepreneurial decision-making as they allow looking at cognitions and emotions at the same time.

15.4 Cognitive Appraisal Theories of Emotion

In this section three cognitive appraisal theories of emotion (or appraisal theories) are presented, namely Richard Lazarus’ cognitive appraisal theory of emotion, Albert Ellis’ theoretical foundations of his rational emotive behavior therapy (REBT), and Bernard Weiner’s attribution theory of emotion.

In general, appraisal theories assume that the emotions elicited by an event depend on how the event is appraised by a person along a number of appraisal dimensions (cf. Siemer and Reisenzein 2007). These emotions influence individuals’ behaviors and, as a consequence, cognitions. Cognitive theories of emotion to some extent differ in the number and the defining content of the assumed appraisal dimensions (Scherer 1999).

15.4.1 *Richard Lazarus’ Cognitive Appraisal Theory of Emotion*

Richard S. Lazarus, a pioneer in the study of cognition and its relation to emotion, differentiates between two kinds of cognition: (a) knowledge (i.e., a person’s understanding of his/her environment) and (b) appraisals (i.e., the evaluation of knowledge and of what is necessary for a person to convert his/her knowledge of the world into something of personal significance) (Lazarus 1991). Thus, knowledge is a precondition for the appraisal of a given stimulus or situation. Appraisals, in turn, are again divided into two types: primary and secondary appraisal (Lazarus 1991). Primary appraisal is an evaluation of knowledge about a certain situation or stimulus in respect to relevance for and incongruence with person’s goals and motivations, whereas secondary appraisal predominantly relates to the individual’s perceived ability to cope with the situation or a potential failure in this situation.

Appraisal processes are hypothesized to generate emotions: Only when the knowledge about a specific stimulus is evaluated in a way indicating that this stimulus is relevant for the individual's goals (primary appraisal) emotions will occur. Secondary appraisal will influence the individual's perception of the stimulus as a threat. For instance, a person might experience the emotion of challenge if a stimulus is appraised as being relevant of an individual's goals (motivational relevance) but incongruent with them (motivational incongruence) and if the individual perceives his or her own coping potential to be sufficient to handle the stimulus (secondary appraisal). Given the same constellation of motivational relevance and incongruence, but an evaluation of one's own coping potential as being insufficient, the resulting emotion would be fear.

Primary appraisal is a necessary prerequisite of every emotion (this assumption of Lazarus has been explicitly or implicitly integrated in practically all existing cognitive theories of emotion), whereas secondary appraisal is not: For instance, the emotion of happiness is hypothesized to merely result from an appraisal of a stimulus as being motivationally relevant and congruent.

As a result of this process, the appraisal and its attendant emotion influence the quality of the person–environment encounter and the way the person might behave in the particular situation. The altered person–environment encounter is then reappraised, the reappraisal leading to yet another change in the emotion quality and intensity of the encounter (Lazarus 1991), creating, in effect, a sort of continuous loop. Transferring this to the field of entrepreneurship, if an entrepreneur interprets a specific opportunity as being in high contrast with his or her goals (e.g., a situation, in which there is a high risk of losing all private savings which is in high incongruence with the entrepreneur's goal of being financially independent) this appraisal will result in emotional states of fear. As a consequence, the encounter will be avoided and cognitively devaluated.

The theory of Lazarus has been applied to different areas of the field of the study of organizations. In the context of innovation, Krause (2004) shows that if managers have a high primary appraisal of innovation (i.e., they see innovation as an important factor in the process of changing the situation), they demonstrate more innovation-related behaviors. Next to that, Casson (1982), Endres and Woods (2006), and Shane (2003) claim that entrepreneurs act differently from other types of individuals because they perceive situations differently, thus indicating that cognitive processes of entrepreneurs to some extent might also be different in terms of primary and secondary appraisal.

15.4.2 Albert Ellis' Rational Emotive Behavior Therapy

Albert Ellis focuses on irrational beliefs, maladaptive emotions, and resulting dysfunctional behaviors. In 1955, he developed the rational emotive behavior therapy (REBT) on the basis of a large clinical practice, which is the reason why he mainly considers negative emotions. In his model (e.g., Ellis 1977, 1991; Ellis and Dryden

1997), people experience undesirable activating events about which they can have rational and/or irrational beliefs which then lead to emotional, behavioral, and cognitive consequences. Rational beliefs about an event express individuals' preferences, whereas irrational beliefs about an event are characterized through illogically high insistence and demandingness (Ellis and Dryden 1997). Rational beliefs are, e.g., "I'd prefer to succeed and be lovable, but I never have to do so," or "I'd very much like others to treat me fairly and considerately, but there is no reason why they must do so," or "I greatly desire my life conditions to be comfortable and pleasant, but I never need them to be that way" (Ellis 1991, p. 144). Irrational beliefs are, e.g., "I absolutely must have my important goals unblocked and fulfilled," or "I can't bear it," or "I'm a worthless person," or "I'll always fail to get what I want and only get what I don't want now and in the future" (Ellis 1991, p. 144). More specifically, irrational beliefs can be classified into four different types: demandingness, awfulizing, global evaluation of self-worth/self-downing, and low frustration tolerance (cf. David et al. 2002). Consequently, rational beliefs are hypothesized to result in functional consequences (i.e., individuals are better able to deal with difficult situations), whereas irrational beliefs should result in dysfunctional consequences (i.e., individuals are less able to deal with difficult situations; David et al. 2002).

Ellis refers to irrational beliefs as "hot cognitions" and to rational beliefs as "warm cognitions." Events which are non-evaluative and therefore hardly result in emotional reactions are referred to as "cold cognitions" (Ellis 1991). Ellis and Dryden (1997) propose a causal relationship between appraisal dimensions, i.e., rational and irrational beliefs, and emotional reactions, i.e., adaptive and maladaptive emotions (cf. Spörrle and Försterling 2007, 2008): Rational beliefs ("warm cognitions") cause adaptive emotions (e.g., fear, sadness), whereas irrational beliefs ("hot cognitions") cause maladaptive emotions (e.g., anxiety, depression). Transferring this to the field of entrepreneurship, an entrepreneur confronted with a potential opportunity is hypothesized to experience the (maladaptive) emotion of anxiety if he or she perceives the self-worth to be inevitably associated with the success in this situation; in case of failure he or she will experience depression. On the other hand, if the success is only associated with high motivational relevance (i.e., importance) the entrepreneur will only experience (mild levels of) fear; in case of failure he or she will experience sadness.

Thus, Ellis' REBT suggests that rational cognitions lead to adaptive emotions and result in functional behavior, whereas irrational cognitions lead to maladaptive emotions and dysfunctional behavior. Empirical approaches to apply REBT theory to organizational contexts (e.g., Spörrle and Welpé 2006; Spörrle et al. 2006, 2008) do not come as surprise since Ellis himself (Ellis 1972) has suggested to do so. Despite this applicability within economic contexts, there is no research examining REBT theory with respect to entrepreneurial activity. Entrepreneurs who think rationally will show adequate negative, adaptive emotions such as fear, which will result in functional, i.e., effective decisions and behaviors, whereas entrepreneurs who think irrationally will show negative maladaptive emotions such as anxiety resulting in poor decisions and ineffective behavior.

15.4.3 Bernard Weiner's Theory of Emotion

Bernard Weiner's theory of emotion is another important representative of appraisal theories and his theory has been widely applied in many fields of psychology (cf. Reizenzein et al. 2003), work and organizational behavior, e.g., help giving in organizational settings (Drach-Zahavy and Somech 2006; Lepine and van Dyne 2001), or performance evaluation of employees and personnel decisions (e.g., Struthers et al. 1998). In Weiner's theory the emotion-eliciting appraisals are causal attributions (Scherer 1999). His theory (Weiner 1980) focuses on emotions such as anger, shame, pride, or joy and shows how they can be explained by ratings on causal dimensions such as locus, stability, and controllability. Locus refers to whether the cause is perceived to be internal, e.g., ability and effort, or external, e.g., task characteristics and chance. Stability determines whether the internal or external causes are temporary or permanent. Ability (internal cause) and task characteristics (external cause) can be seen as stable and permanent causes. Effort (internal cause) and chance (external cause) are variable and temporary causes. In addition, events can be rated as controllable, e.g., effort, or uncontrollable, e.g., ability, task characteristics and chance, depending on the extent of personal influence (Reizenzein et al. 2003). These attributions cause emotions which in turn influence behavior (Weiner 1980, 1985). In this process of emotion formation Weiner (1985) proposes a sequence of cognitions becoming increasingly complex. First, the event is generally evaluated as positive or negative. At this stage, outcome-dependent emotions such as happiness or sadness arise. The second step is the causal ascription of the event and its results are attribution-dependent emotions. For example, if entrepreneurs perceive the cause of the outcome to be internal and controllable, they experience pride for a positive and guilt for a negative outcome. When the event is attributed to an external cause emotions such as anger or pity are felt. Anger is associated with the perception of a high level of controllability, whereas pity is associated with a high level of uncontrollability (Weiner 1985). Positive and negative emotions in turn give the impulse and the direction for behavior (Weiner 1980). Thus, Weiner (1980) proposes that emotions mediate the relationship between cognitions and behavior or behavioral tendencies.

15.5 A Model to Study Emotions and Cognitions in the Entrepreneurial Decision-Making Process

In this section, we propose a model based on the well-known stimulus–organism–response model (S–O–R) to study emotions and cognitions in the entrepreneurial decision-making process and the resulting behaviors or behavior tendencies. After behaviorists (e.g., Pavlov, Watson) introduced the stimulus–response model and considered the organism as a “black box,” Woodworth (1921) added the organism to the strict stimulus–response model of the behaviorists. He proposed that the stimulus

influences the organism and leads to a certain behavior, however, the stimulus does not have to end automatically in a response.³ Although most modern psychologists subscribe to different versions of the S–O–R model, they recognize that only the stimulus and the response can be observed directly. All variables of the organism, namely perceptual, cognitive, emotional, and motivational variables must be inferred from their indicators (e.g., physiological measures) or the relationship that is observed between classes of stimuli and classes of responses (Shaver and Scott 1991). It was Shaver and Scott (1991) who first introduced the S–O–R model to the field of entrepreneurship research. As well as in Shaver and Scott’s (1991) model, the stimulus in this model (Fig. 15.2) is an entrepreneurial opportunity described by some possible parameters such as profit margin, time to profit, prior personal investment, probability of success, and risk propensity. The organism consists of psychological variables such as perception, cognitions, emotions, and motivations, which might lead to a response that could in the first loop of entrepreneurial decision-making be described as the evaluation and exploitation of the entrepreneurial opportunity in this model. After the decision to exploit an entrepreneurial opportunity, the entrepreneurial opportunity will change into a new stimulus with other features which will again be processed in the organism and might lead to further evaluations of entrepreneurial decision options, entrepreneurial decision outcomes, and entrepreneurial behavior.

The entrepreneurship literature proposes various characteristics which influence the decision to exploit an entrepreneurial opportunity. In this paragraph, we want to stimulate some possible features of entrepreneurial opportunities which are the stimulus of all entrepreneurial decisions. Shaver and Scott (1991), following Cromie (1988), give several reasons which influence the decision to become an entrepreneur

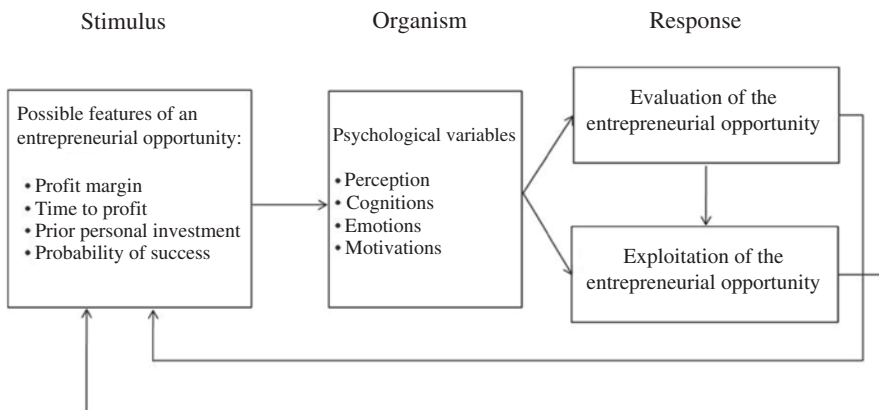


Fig. 15.2 S–O–R model to study entrepreneurial decision-making

³This concept was later transferred into a formula by Kurt Lewin (1890–1947), who established that behavior is a function of both person and environment or $B=f(P, E)$.

such as desire for autonomy, interest in personal achievement, dissatisfaction with current job, desire to make money, and unhappiness in current career. When evaluating a certain business idea, entrepreneurs as well as managers lay their focus on the break-even point, potential market size, potential profit, available government funds, and the ratio of investment size to total assets (Busenitz and Barney 1997). Other researchers discovered that lower probabilities and levels of potential financial loss as well as lower levels of perceived risk are crucial for the decision to exploit an entrepreneurial opportunity (e.g. McNamara and Bromiley 1997; Palich and Bagby 1995; Simon et al. 2000). Additionally, Shane and Venkataraman (2000) detected that an entrepreneurial opportunity with large expected demand, high industry profit margins, young technological life cycle, medium density of competition in a particular opportunity space, low capital cost and medium population level learning from other entrants increases the likelihood of exploiting an entrepreneurial situation. For most individuals, exploitation is more likely when the value of the opportunity preponderates the costs to generate that value, financial capital is high, strong social ties to resource providers is available, useful information/knowledge about entrepreneurship resulting from prior experience is given, the transferability of this information/knowledge is possible, and prior entrepreneurial experience exists (Shane and Venkataraman 2000). However, it must be mentioned that features that increase the probability of entrepreneurial opportunity exploitation do not necessarily increase the probability of success. According to Forlani and Mullins (2000) and Shane and Venkataraman (2000), profit margin, level of personal investment, time to profit margin, and probability of success are assumed to be the most important for the entrepreneurial evaluation and exploitation process which is why we propose them as possible situational features in the S–O–R model.

15.6 Implications

Against the background of this chapter and the derived S–O–R model for the entrepreneurial decision-making process, several implications can be made. In this section, we give recommendations how the role of emotions and cognitions in entrepreneurial decision-making can be further investigated, how emotions and cognitions should be integrated in entrepreneurship practice, and how entrepreneurship teaching can approach emotions and cognitions in the decision-making process of (potential) entrepreneurs.

15.6.1 Recommendations for Future Research

Considering that the field of emotions and cognitions is not only under researched in the domain of entrepreneurship but also in psychology and economics, basic emotion research needs to be done in order to create a fundamental understanding of how

emotions influence decision-making and how they interact with cognitions in decision-making processes. Our proposed S–O–R model could serve as a theoretical framework for this intention as it allows to directly looking at the psychological variables, especially emotions and cognitions, of the organism by integrating cognitive appraisal theories of emotions in future research. As far as we are aware, cognitive appraisal theories of emotions have not been investigated in the context of entrepreneurship so far, although they enable one to look at emotions and cognitions at the same time. The GEW presented above can be used as an instrument to investigate the dimensional layout of the emotion qualities on pure appraisal dimensions (arrangement of emotion terms in two-dimensional space) and the intensity of the associated subjective feeling (distance from origin) (Scherer 2005). Especially negative emotions such as fear and anxiety (e.g., Koellinger et al. 2007; Lee et al. 2005; Shepherd 2004; Sternberg et al. 2007) deserve a closer look as previous research (e.g., Vaish et al. 2008) indicated that the approach component of positive affect is less important for entrepreneurial decisions and actions than the avoiding component of negative affect (“negativity bias”). However, a challenge in the research of emotions and their effects on cognitions is that emotions are often multi-dimensional, e.g., anger combined with sorrow or pleasure combined with fear (Baron 2008). Also emotion-related constructs such as passion, optimism, and enthusiasm (e.g., Baron 2008; Baum and Locke 2004; Cardon et al. 2005) should be added to future research in this field. Additionally, entrepreneurial cognitions such as creativity play a crucial role in entrepreneurial decision-making (Baron 2008; Hamidi et al. 2008; Hills et al. 1997; Kay 1986) and should therefore also be integrated in future research.

Another interesting research topic here is (potential) entrepreneurs’ environment and their social life as emotions and cognitions are shaped through these. Entrepreneurs’ environment is characterized through certain surrounding conditions such as the regulatory, economic, and social conditions which should not be neglected in future research of emotions and cognitions (e.g., Ardichvili et al. 2003; McMullen and Shepherd 2006). Network theories (e.g., Low and McMillan 1988) propose that entrepreneurs who have extended networks identify significantly more opportunities than solo entrepreneurs (e.g., Ozgen and Baron 2007; Singh et al. 1999). Additionally, the quality of entrepreneurs’ networks affects characteristics such as entrepreneurial alertness and creativity (Hills et al. 1997). Granovetter (1973), for example, argues that weak ties are stronger “bridges” to information sources than strong ties, because most people have more weak than strong ties. De Koning (1999) classifies entrepreneurs’ social networks into inner circle, “action set”, partnerships, and a network of weak ties. Then again, Birley (1985) differentiates informal (family, friends, business) and formal (banks, accountants, lawyers) networks. She found that entrepreneurs rely heavily on the informal network, but seldom tap into the formal network. Especially children of entrepreneurial parents have information that is unavailable to children whose parents did not start or purchase a firm (Shaver and Scott 1991) and therefore entrepreneurs tend to come from families where the parents already own/owned a business (Cooper and Dunkelberg 1987). As a result, the extent and the quality of social networks increase the amount and the quality of information (cf. Picot et al.

2008). Regarding the social networks of entrepreneurs it can be concluded that entrepreneurs evolve opportunities by pursuing three cognitive activities (information gathering, thinking through talking, and resource assessing) through active interaction with an extensive network of people.

Also socio-demographic factors and their connection to emotions and cognitions should be investigated in future entrepreneurship research. For example, the exploration of gender, age, or education with regard to the influence of emotions and cognitions on entrepreneurial decision-making could bring promising results.

Some researchers (e.g., Dess et al. 2003; Hitt et al. 2001; McGrath and MacMillan 2000) argue that entrepreneurship research should be integrated with strategic management and innovation management research as they have entrepreneurial opportunities as a base for decisions. Moreover, these decisions cannot follow given theoretical frameworks as they, just as entrepreneurial decisions, have to be made under rapidly changing and uncertain conditions.

Finally, there are numerous possibilities derived from classical psychological methods of experiments, interrogation, and observation as well as methods from neuroscience (cf. Cacioppo and Gardner 1999) to study to the role of emotions and cognitions in the entrepreneurial decision-making process. The most important thing to keep in mind, however, is that emotions and cognitions cannot be studied without each other, but always need to be investigated together.

15.6.2 Recommendations for Practice

From the study of emotions and cognitions in entrepreneurial decision-making several recommendations for practice can be given. (Potential) entrepreneurs should be aware that they have a “subjective” view of objectivity when it comes to entrepreneurial decisions. (Potential) entrepreneurs might also be interested to know that their emotions systematically influence the decisions they make. As we outlined how the interaction of emotions and cognitions influence entrepreneurial decision-making, (potential) entrepreneurs might also want to know which emotions and cognitions lead to which behavior. For example, judgments are highly dependent on affective states and the probability of negative events is considered higher by depressive individuals than by happy individuals. Negative thinking from entrepreneurs in a negative mood could lead to decisions which are more likely to be poor for their venture than from positive thinking entrepreneurs. Additionally, there are findings (e.g., Saavedra and Early 1991) that individuals in a positive affective state feel a higher self-efficacy than individuals in a negative affective state. In addition, entrepreneurs should be aware of the emotions of their employees, investors, customers, etc., and try to handle them efficiently. For example, if entrepreneurs are able to pass their positive emotions to their customers, they will be more willing to try new products (Kahn and Isen 1993) because their risk propensity in low involvement decisions is higher in positive emotions. However, high involvement decisions are avoided in positive emotions as individuals do not want to spoil it with a bad

decision (Arkes et al. 1988). Hence, entrepreneurs could learn how to become aware of their affective states in cognitive and emotional awareness trainings.

As previous research (e.g., Vaish et al. 2008) showed that the approach component of positive affect is less important for entrepreneurial decisions and actions than the avoiding component of negative affect (“negativity bias”), entrepreneurship trainings and coachings should rather focus on the reduction of negative emotions and the coping of failure than on the enhancement of positive emotions. However, happy entrepreneurs are more successful than sad entrepreneurs because happy people focus more on increasing their knowledge structure, learning new skills, or on social contact with others. Thus, happy entrepreneurs generally get more involved with their environment which in turn leads to more success in many instances regarding their new venture (e.g., Baron 2008; Fredrickson 2001).

Following cognitive appraisal theories of emotions, emotional reactions can be changed by changing their underlying appraisals and attitudes. If an entrepreneur is very angry about a controllable goal with incongruent outcome, the entrepreneur might be well advised to ascribe the incongruent outcome to an uncontrollable cause in order to attenuate a strongly negative emotional reaction.

15.6.3 Recommendations for Teaching

Kuratko (2005) writes that the number of colleges and universities in the United States that offer courses related to entrepreneurship has grown from a handful in the 1970s to over 1600 schools in 2005 offering about 2200 entrepreneurship courses. These numbers show that entrepreneurship teaching increased in the last 30 years, however, this does not say that these courses teach the “right” things. As most researchers could agree, entrepreneurial attitudes are an important prerequisite to enhance entrepreneurship propensity (e.g., Gasse 1985; Gorman et al. 1997). Teaching these attitudes as one part of entrepreneurial education could be divided into different stages of learning: in elementary school, high school, college, and university. Additionally, Gorman et al. (1997) emphasize the importance to distinguish among entrepreneurship, enterprise, and small business management education and to differentiate each of these from traditional approaches to management education.

Interpretations and appraisals play an important role for entrepreneurial decisions and behavior and are shaped by individual social and environmental background. This could be a connecting factor for teaching in the field of entrepreneurship and interpretations and appraisals could also be a link for the motivation of entrepreneurial decision-making and action. Entrepreneurship teaching could stimulate interpretations and appraisals of entrepreneurial decision-making and action. As, for example, creativity was found to be an important cognition for entrepreneurial action (e.g., Baron 2008; Hamidi et al. 2008; Hills et al. 1997; Kay 1986), Hamidi et al. (2008) argue that creative exercises could lead to a higher likelihood to engage in entrepreneurial action.

Entrepreneurship, innovation, and strategic management courses could and should teach, besides mere information and knowledge, emotion and cognition management, especially, dealing with negative affective states. These course variables could also be taught to analysts and project managers as those could be advised on the importance of the subjective appraisals and actual affect in decision-making and judgments.

Darwin (1872) already found emotional expressions to be independent of cultures and that emotions are part of our genetic fundamentals. Thus, emotions themselves might not be easily taught directly, but recognizing emotions, understanding the causes of emotions, anticipating the impacts of emotions, controlling emotions, and hiding or suppressing emotions should be the central subject of entrepreneurship teachers, because (potential) entrepreneurs recognizing their emotions and knowing about possible impacts of their emotions on their cognitions (and subsequent behaviors) are more likely to make better entrepreneurial decisions for their enterprises.

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Chapter 16

The Role of Emotions and Cognitions in the Pre-entrepreneurial Process: What's New?

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16.1 Introduction

Emotions have long been neglected in entrepreneurship research and scholars mostly focused on cognitive models and on external influences. With the argument that emotions and cognitions are inseparably intertwined came the insight that emotions and cognitions have to be studied together to gain an understanding of why some individuals become entrepreneurs while others do not. Over the past decade or so, emotion research has found its way into entrepreneurship research, and the empirical results surrounding this research look very promising in advancing the field of entrepreneurship.

Research on emotion and cognition has made important advances in entrepreneurship; however, most studies have focused on either the early or the late stages of the entrepreneurial process. Hence, in the future, it will also be fruitful to examine the interactive influences of emotions and cognitions in the stages between entrepreneurial entry and exit. Nevertheless, as an update on the previous chapter in this book, we will give an overview of the developments in the area of emotions and cognitions in the pre-entrepreneurial process.

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The pre-entrepreneurial decision-making process is still defined as containing opportunity recognition, evaluation, and exploitation. However, there have been recent calls and first studies that put their research focus beyond opportunity exploitation and thereby bridging the gap to entrepreneurial action. Thus, our updated model includes the steps from the decision to exploit an opportunity to taking action toward entrepreneurship and the emotions and cognitions involved in these stages.

16.2 Update on the Concepts of Affective Experiences Within the Entrepreneurial Process

With the study of emotions in entrepreneurship comes a variety of different approaches drawn from the field of psychology. Although scholars still claim that there is no unanimous definition of the terms affect, emotion, mood, and feeling, it appears that most research applies quite similar definitions of these concepts. Affect is used as an umbrella term for all affective experiences. Emotions are typically directed toward an object and are intense and short-lived, while moods often have no clear reason and are mild but longer-lasting experiences. Feelings are described as the conscious subjective experience-based aspect of a current affective state. Most entrepreneurship scholars have used theories and methodologies that are valid for all of these terms.

As with early psychological studies, the majority of entrepreneurship studies on emotions have contrasted positive with negative affect or emotions. Nevertheless, scholars have acknowledged that positive and negative affect are relatively independent dimensions (Tellegen and Watson 1999; Watson and Tellegen 1985) and individuals can be high or low on both at the same time. For instance, homesickness is characterized by simultaneous positive (appreciation) and negative (sadness) emotional components. In other words, positive and negative affect do not appear to represent two mutually exclusive ends of the same continuum. However, only a few entrepreneurship studies have compared positive and negative emotions to neutral emotions or have examined discrete emotions such as joy, fear, or anger (Foo 2011; Grichnik et al. 2010; Welpe et al. 2012). While the valence dimension (i.e., pleasantness and unpleasantness) is a familiar dimension of emotions, the arousal dimension (i.e., level of activation) and the dominance dimension (i.e., control over the situation) have largely been neglected in current entrepreneurship studies. When speaking of the dimensional model of emotions (Russell 1980; Watson and Tellegen 1985), it is worth noting that this model is not in conflict with the discrete view of emotions (Ekman 1992; Scherer 2005). In fact, these approaches are complementary rather than conflicting, as all discrete emotions possess a unique profile of dimensional manifestations.

With the acknowledgment that affective experiences represent independent, yet related constructs, the door was opened for research on mixed emotions or emotional ambivalence. Early papers argued that positive affect can diminish the salience of negative affect (Baron 1976, 1984; Mueller and Donnerstein 1977), and papers

after 2000 showed that positive emotions do not exclude the experience of negative emotions at the same time (Fong 2006; Fong and Tiedens 2002; Larsen et al. 2001, 2004; Williams and Aaker 2002). Nonetheless, to the best of our knowledge, there is only one paper that investigated the topic of mixed emotions in entrepreneurship (Podoyntsyna et al. 2012). Another study examined the role of affective shifts for creativity (Bledow et al. 2013).

Other studies have developed and tested theories about affective experiences that appear to be particularly important for entrepreneurs. For example, Cardon and colleagues (Cardon et al. 2005, 2009; Cardon 2008) have studied how passion, “a consciously accessible, intense positive feeling” (Cardon et al. 2009, p. 7), impacts entrepreneurial motivation and action. In addition, Shepherd (2003) has introduced grief and its management as a prominent affective experience after entrepreneurial failure. A later study by Shepherd and colleagues (2009) suggests that a period of anticipatory grief reduces the emotional costs of business failure and thus may enhance emotional recovery. However, it is still an open question how these specific affective experiences are related to discrete emotional states in the entrepreneurial process.

Moreover, there are some other emerging affective constructs in entrepreneurship research. First, two recent studies have examined the role of social, other-oriented emotions (Fessler 2007) such as shame and pride (Doern and Goss 2013; Goss 2005) in the entrepreneurial context. Second, Rhee and White (2007) investigated individual differences in emotional intelligence and their consequences for entrepreneurial behavior (see also Spörrle et al. 2006). Third, a topic that has surfaced as important but is still untouched by entrepreneurship scholars is the role of anticipated emotions such as expected regret, disappointment, or rejoicing (e.g., Mellers and McGraw 2001; Perugini and Bagozzi 2001).

Finally, only a few studies have taken the difference between state and trait affect into account (Foo 2011). Individuals vary in their affective dispositions, meaning a relatively stable and cross-situational tendency toward a particular affective state, which has been labeled trait affect(ivity). However, regardless of their dispositional affect levels, individuals can still experience nontypical affective states which vary as a function of the given situation. Dispositionally unhappy people can experience positive affective states in specific situations, although more rarely than dispositionally happy people. Similarly, dispositionally happy people are still able to experience negative affective states. For entrepreneurship research, it may be worthwhile to study the interactions of trait and state affect in entrepreneurs. Patzelt and Shepherd (2011) have investigated the frequency and salience of experienced emotions which, although not explicitly mentioned by the authors, could be termed as affective trait.

16.3 Update on Entrepreneurial Cognitions

Entrepreneurial cognitions have received a vast research interest in the last years (e.g., Baron 1998; Baron and Ward 2004; Hmieleski and Baron 2009; Mitchell et al. 2007). Similarly, the study of cognitive biases has received ample attention in

entrepreneurship research. For example, entrepreneurs tend to be more optimistic and overconfident (Koellinger et al. 2007; Simon and Houghton 2003), and they frame risk in quite different ways than non-entrepreneurs (Simon and Houghton 2003; Forlani and Mullins 2000). Moreover, entrepreneurs appear to be more prone to heuristic thinking such as the planning fallacy, illusion of control, the belief in the law of small numbers, and reasoning by analogy (Keh et al. 2002; Simon and Houghton 2002). However, only a few studies have investigated the positive effects which cognitive biases, such as overconfidence, can have in the entrepreneurial process (Koellinger 2008) or for CEOs (Galasso and Simcoe 2011; Hirshleifer et al. 2012).

In addition to cognitive biases, other cognitive phenomena have been studied such as counterfactual thinking (Arora et al. 2013; Gaglio and Katz 2001). Counterfactual thoughts are reflections upon “what might have been” if the individual had acted differently or if the circumstances surrounding an event or action had been different. Counterfactual thinking of entrepreneurs has generally been suggested to have a positive impact for the entrepreneurial process.

Overall, the entrepreneurs’ cognitive maps or scripts or schemata appear to be somewhat different than the ones of managers (Bougon 1992; Fiol and Huff 1992; Hodgkinson et al. 1999). Although cognition researchers have conceptually agreed that entrepreneurs think differently (Busenitz and Barney 1997; Gaglio and Katz 2001; Sarasvathy et al. 1998; Simon et al. 2000), to date there has been no empirical study that examines the cognitive maps of entrepreneurs and their impact on the entrepreneurial process. Implicitly, however, cognitive maps have been studied in the context of opportunity recognition (Baron and Ensley 2006; Gaglio and Katz 2001).

Finally, another cognitive theory recently introduced to entrepreneurship research is social cognition theory (Arora et al. 2013; Hmieleski and Baron 2009). Social cognition theory represents an approach to the study of human cognition and information processing that assumes that the motivations, emotions, and other attributes of the individual impact cognition and subsequently how the individual interprets the social world (Fiske and Taylor 1991; Showers and Cantor 1985; Tetlock 1990). Within this theory, it is fundamental to simultaneously understand cognitive processing and outcomes as well as the goals, emotions, and motivations of the individual actor within the context of the situation. As this theory incorporates several factors that were shown to be important in the entrepreneurial process, it might prove fruitful to continue applying it in future research.

16.4 Emotions and Cognitions in the Pre-entrepreneurial Process

Within the last years, there have been several papers theorizing or examining the relationship between affective phenomena and cognitions in the (pre-) entrepreneurial process. To study these effects in the entrepreneurial context, scholars have applied a variety of psychological models and theories. A model that has frequently been used as theoretical framework in entrepreneurship studies is the affect infusion model (AIM; Forgas 1995).

The AIM suggests that affect's infusion in judgments increases as the information processing mechanisms move from reconstructive to constructive. Affect infusion works through two different, but complementary mechanisms: affect as information (heuristics processing) and affect priming (substantive processing). In addition, the AIM suggests that the familiarity of the subject to be judged determines whether constructive or reconstructive processing strategies are used. Hence, familiar subjects lead to the use of reconstructive processing strategies where affect has little or no impact on judgments. In contrast, affect infusion is suggested to be especially significant in circumstances of high uncertainty and high engagement. Affect's infusion in judgments, decisions, and actions in an entrepreneurial context is thus assumed to be particularly strong as these occur under conditions of elevated risk and uncertainty (Baron 2008), involve social cognitions (Krueger 2007), and often require entrepreneurs to make judgments and decisions about complex matters with limited time or information (Busenitz and Barney 1997). However, we could also expect affect's infusion to decline as the entrepreneur progresses through the entrepreneurial process because uncertainty and engagement may decrease.

The affect-as-information hypothesis suggests that affect carries informational value that is used for the decision at hand (Schwarz and Clore 1983). When making evaluative judgments, people often ask themselves implicitly "how do I feel about it?" and use their current affective state as a reaction to the target. Positive affect signals that the object of judgment is valuable, leading to a positive evaluation, and negative affect signals that it lacks value, leading to a negative evaluation (Clore and Huntsinger 2007). Hence, affect as information is a prime candidate to use as a theory for the pre-entrepreneurial process, but it was only used in a study of Welpel et al. (2012) to investigate opportunity evaluation and exploitation. A study by Foo et al. (2009) used it to explain the impact of affect on venture effort.

Affect priming refers to people's tendency to store, process, and retrieve materials in memory related to their current affective state (Bower 1981; Johnson and Tversky 1983). Hence, people in positive affect are inclined to positive memories which trigger positive information and optimistic assessments, while people in negative affect tend toward negative memories triggering negative information and pessimistic assessments. Thus, affect priming appears to result in affect-congruent judgments and decisions. Furthermore, when a memory is associated with particularly intense affective states, then it is more likely to be stored and retrieved. Affect priming has recently been applied by Hayton and Cholakova (2012) to develop a conceptual framework of affect and idea perception in the entrepreneurial context.

Next to AIM, several recent studies in entrepreneurship are based on the appraisal tendency framework (e.g., Foo 2011; Jenkins et al. 2012; Podoyntsyna et al. 2012; Welpel et al. 2012). While we presented three different cognitive appraisal theories of emotions in our previous book chapter, the majority of current entrepreneurship studies have applied the basic appraisal tendency framework introduced by Smith and Ellsworth (1987). The appraisal tendency framework makes two assumptions (Smith and Ellsworth 1985; Ellsworth and Smith 1988): First, emotions trigger changes in cognition, which persist beyond the time when the emotion-eliciting situation has passed, and possibly to unrelated events (Gangemi et al. 2007; Lerner et al. 2004). Second, emotions are linked to specific appraisals of the environment;

through these cognitive appraisals, emotions predispose individuals to take particular actions (Spörrle and Försterling 2007). However, appraisals of some emotions could also change from one situation to another (for a review see Tong et al. 2009). Similarly, studies in social psychology have shown that different emotions of the same valence can have opposite effects in a variety of decision-making situations and that emotions with the same cognitive appraisal tendency are more alike than emotions of the same valence (DeSteno et al. 2004; Fessler et al. 2004; Lerner and Keltner 2000, 2001; Raghunathan and Pham 1999).

In addition, particularly in the study of the very early stages in the entrepreneurial process, such as idea perception and opportunity discovery, the broaden-and-built hypothesis has been applied to explain the impact of positive affect (e.g., Fredrickson 2001; Isen 2000). This hypothesis is based on one of the most consistent findings within the affect literature: positive affect widens the scope of attention, while negative affect leads to narrowing of attention. Hayton and Cholakova (2012) apply this theory to motivate their assumption that more stimulating information for an entrepreneurial idea is perceived when experiencing positive affect.

A theory that has not been applied in entrepreneurship research so far is the mood maintenance hypothesis. The mood maintenance hypothesis suggests that people in positive affect behave in a way to maintain their positive state, for instance, by showing risk-averse behavior in a positive state, while people in negative affect try to restore their negative mood, for instance, by engaging in risk-seeking behavior when in a negative state (Isen and Patrick 1983). It may be promising to include this theory in future entrepreneurship research, for example, when investigating the concept of entrepreneurial effort or persistence.

A recent study by Patzelt and Shepherd (2011) investigated the effect of emotional coping in the entrepreneurial context. They find that, depending on their regulatory coping behavior, entrepreneurs perceive fewer negative emotions than employees. Coping behavior (see Carver et al. 1989 for a review of different coping strategies) and emotion regulation (see Gross 1998a, b for a review on emotion regulation) may be particularly important to study because entrepreneurs report higher levels of job stress than employees (Jamal 1997; Harris et al. 1999). Hence, coping behavior and emotion regulation of entrepreneurs is certainly worth further examination in future entrepreneurship studies.

Another intriguing future research question is how affect might influence the application of heuristic thinking in entrepreneurial decision making. Scholars have argued that entrepreneurs tend to engage in heuristic thinking at times when others do not (Busenitz and Barney 1997; Sarasvathy 2007; Simon et al. 2000). This argument is based on the finding that affect is a main driver of intuitive thinking (Epstein 1994; Kahneman 2003) and on the assumption that affect infusion happens when performing unstructured tasks in highly uncertain and unpredictable environments (Baron 2008; Forgas 1995). Hence, it is very likely that emotions influence heuristics in entrepreneurial decision making, but this assumption has not yet been empirically tested. Moreover, there is the assumption that the greater the ambiguity in an entrepreneur's working environment, the more likely does he experience different emotions at the same time (Folkman and Lazarus 1985; Larsen et al. 2004;

Podoyntsyna et al. 2012). However, this assumption also has not been explicitly investigated.

In line with the situational argument of affect's infusion on cognition (Forgas 1995), the interactive influence of emotion and cognition may also be likely to change, depending on the context. Thus, promising research paths may be to study the role of emotions and cognitions in different contexts such as family support (Madjar et al. 2002) or VC support or other work-related individuals (Madjar 2008; McColl-Kennedy and Anderson 2002). In fact, supportive contexts of supervisors (George and Zhou 2007) and work conditions (Amabile et al. 1996) have been shown to play a significant role in the impact of emotions on creativity.

16.5 An Updated Model on Emotions and Cognitions in the Pre-entrepreneurial Process

This section presents the most recent findings of emotions and cognitions in the pre-entrepreneurial process. In contrast to our previous model in this book, the updated model shown in Fig. 16.1 is more generic with the aim to cover more studies and provide more possibilities for future research. Our current model also intends to grasp the influence of contextual factors throughout the pre-entrepreneurial process. Eventually, we also made two changes that are worth explicit mention. First, we included the bridge from the decision to exploit an entrepreneurial opportunity to

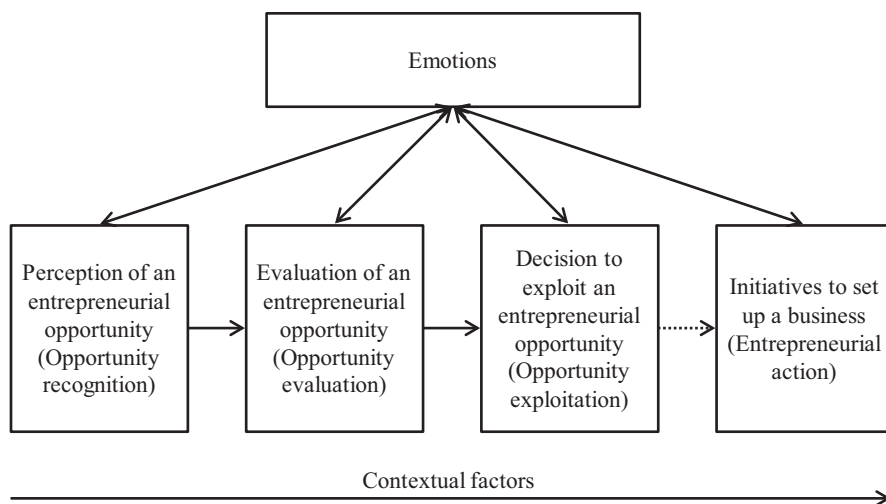


Fig. 16.1 An updated model on the role of emotions and cognitions in the pre-entrepreneurial process

actually taking entrepreneurial action. We believe that this addition is important to push forward research on the intention-action gap because we know very little about the cognitive and emotional processes that take place from transitioning from potential to nascent entrepreneur.

Second, we want to note that our current model not only contains the bidirectional link between emotions and cognitions but also the bidirectional link between emotions and cognitions and the different phases of the pre-entrepreneurial process. Emotions and cognitions influence the entrepreneurial process, but entrepreneurial behaviors also influence emotions and cognitions such as the experience of excitement, happiness, and flow (Komisar 2000; Rai 2008; Schindehutte et al. 2006). In addition, developing new products and building new business networks were shown to induce positive affect (Kato and Wiklund 2011). Similarly, a recent study by Frese and Gielnik (2011) suggests that entrepreneurial action leads to passion rather than passion leading to action (Cardon et al. 2009).

16.5.1 Opportunity Recognition

Opportunity recognition or identification contains components of cognitive maps and patterns as well as creative processes. Hayton and Cholakova (2012) develop a framework for understanding the role of effect on idea perception and the intention to develop the entrepreneurial idea. They propose that affect represents a significant source of attitudes and perceptions of entrepreneurial ideas that may explain variation in how entrepreneurs feel about specific ideas and therefore influence whether or not they develop intentions to continue to develop those ideas.

Studies in social psychology and organizational behavior have demonstrated that positive affective states are associated with superior performance on creative tasks (Ashby et al. 1999, 2002; Estrada et al. 1997; Isen 2000; Isen et al. 1978). They suggest that novelty, a defining feature of creativity, is the result of increased levels of variation of ideas, and this is a function of the number and range of cognitive elements that are available (Amabile et al. 2005; Simonton 1999). Hence, positive affect may improve opportunity recognition through increased creative thoughts, but to date no entrepreneurship study has empirically examined this relationship.

Gaglio and Katz (2001) and Gaglio (2004) suggest that because counterfactual thinking involves deconstructing and reconstructing scenarios, counterfactual thought processes may result in the identification of otherwise unforeseen opportunities. A recent study by Arora and colleagues (2013) proposes that people experiencing positive affect engage more in counterfactual thinking. Thus, we may also argue that positive affect has a positive influence on opportunity recognition through increased counterfactual thinking.

Nevertheless, we do not know yet how discrete positive or negative emotions may affect opportunity recognition. As stated above, positive emotions do not necessarily show opposite effects of negative emotions. Hence, the potential effect of negative emotions on opportunity recognition cannot be derived from findings on

positive emotions. Grichnik et al. (2010) suggest that negative emotions may positively influence opportunity recognition based on a meta-analysis by Davis (2009) on the relationship between emotions and creativity. This meta-analysis revealed that the positive effect on creativity of positive emotion is strongly significant in contrast to neutral emotional states, but the effect shrinks when weighed against negative emotional states. Therefore, future entrepreneurship studies should not only look at positive or negative emotions or contrast between them but choose discrete emotional states and compare them with neutral emotions.

This discussion about positive versus negative affect brings us back to the topic of mixed emotions and emotional ambivalence and their potential effect on opportunity recognition. Podoyntsina et al. (2012) argue that ambivalence may increase opportunity recognition, but mixed emotions may trigger opportunity refusal. Individuals who are feeling emotionally ambivalent demonstrate an increased sensitivity to associations and creativity (Fong 2006), while individuals experiencing mixed emotions show increased risk perception. The phenomenon of entrepreneurship is full of different emotional experiences, and the study of mixed emotions is thus very relevant for a comprehensive understanding of affective experiences in the pre-entrepreneurial process.

Eventually, a recent study by Doern and Goss (2013) investigated behavioral appeasement associated with recurrent power rituals between entrepreneurs and state officials. Appeasement coincided with feelings of shame and reduced entrepreneurial initiatives and the motivation to grow. Building on their finding, we may argue that negative social emotions, such as shame, have a negative influence on opportunity recognition and on the subsequent entrepreneurial process. Similarly, it may also be exciting to capture the effects of positive social emotions such as pride for opportunity recognition and the following process leading to entrepreneurial action.

16.5.2 Opportunity Evaluation

Scholars have had an interest in individual differences in opportunity evaluation from different perspectives (e.g., Gupta et al. 2014; Haynie et al. 2009; Keh et al. 2002; Shepherd et al. 2007; Wood and Williams 2014). However, only a few studies have investigated the role of emotions in the cognitive process of opportunity evaluation (Foo 2011; Grichnik et al. 2010; Welpe et al. 2012). None of the studies conceptualized opportunity evaluation as consisting of desirability and feasibility beliefs—as suggested by extant literature—but all three papers applied experimental approaches in their studies, thereby being able to detect causal effects.

The paper by Foo (2011) presents two studies. In the first study, he induced anger, fear, happiness, and hope and showed a different impact on students' risk perceptions of entrepreneurial venture scenarios. In the second study, he also found a positive relationship between dispositional happiness and anger and entrepreneurs' risk-taking propensity. Participants' scores on risk perception for a venture

scenario were significantly lower for anger and happiness-induced participants (emotions associated with outcome uncertainty and a lack of outcome control) than for fear- and hope-induced participants (emotions associated with outcome uncertainty and a lack of outcome control). These findings confirm the study results of Lerner and Keltner (2000, 2001) that demonstrated that fearful people made risk-averse choices, while angry and happy people made risk-seeking choices, in an entrepreneurial context.

In line with Foo's conceptualization of risk being an important aspect of opportunity evaluation, the study by Podoyntsyna et al. (2012) investigated the influence of mixed emotions on entrepreneurs' risk perceptions. The study shows that mixed emotions have an impact on entrepreneurial risk perceptions over different cognitive appraisals. In addition, the study demonstrated that entrepreneurs' emotional reactions to strategic issues were different for habitual entrepreneurs.

The paper by Grichnik et al. (2010) analyzed the impact of induced joy and fear on opportunity evaluation as an antecedent to opportunity exploitation. Their results demonstrate that fear influences opportunity evaluation negatively, while joy has a positive influence on opportunity evaluation. Lastly, the paper by Welpel et al. (2012) investigated the indirect effects of joy, fear, and anger in the relationship between opportunity evaluation and opportunity exploitation. We will elaborate on their findings in the next section.

Although important advances have been made in understanding the role of emotions in cognitive evaluations of an entrepreneurial opportunity, the range of empirical studies on this relationship is still scarce. To push empirical research, we suggest conceptualizing an entrepreneurial opportunity as first-person beliefs of desirability and feasibility and applying psychological theories addressing the effects of emotions and judgements. These conceptualizations may help to measure emotions' effects on opportunity evaluation which is still described as the "black box" between opportunity recognition and exploitation.

16.5.3 Opportunity Exploitation

Opportunity evaluation is regarded as antecedent to opportunity exploitation, and the decision to exploit an entrepreneurial opportunity can be seen as prerequisite to taking entrepreneurial action. In this perspective, opportunity exploitation stands between opportunity evaluation and entrepreneurial action.

So far, only two studies have examined the role of emotions for opportunity exploitation, both as the outcome of opportunity evaluation (Grichnik et al. 2010; Welpel et al. 2012). Both studies also tested opportunity evaluation as a mediator between opportunity characteristics and opportunity exploitation, but only Welpel et al. (2012) found empirical support for this mediation. Grichnik et al. (2010) analyzed the impact of induced joy and fear on opportunity exploitation and found that joyful entrepreneurs were less willing to exploit an entrepreneurial opportunity compared to a neutral control group. They did not find support for the opposite

effect of fear; instead they found that fearful entrepreneurs are also more inclined toward opportunity exploitation.

The study by Welpe et al. (2012) found that fear, joy, and anger directly impact the likelihood of exploiting an entrepreneurial opportunity. Fear negatively influences opportunity exploitation, whereas joy and anger positively influence opportunity exploitation. Furthermore, fear, joy, and anger significantly decrease or increase the positive association between opportunity evaluation and exploitation tendencies, respectively. Hence, emotions cannot only directly but also indirectly influence opportunity exploitation and possibly also other stages of the pre-entrepreneurial process.

While opportunity evaluation is defined as a cognitive concept, opportunity exploitation can better be conceptualized as a decision with an intention to act. In this sense, the impact of emotions on opportunity exploitation may best be described with psychological theories of emotions and decision making rather than emotions and judgments. Furthermore, entrepreneurs often do not only decide if they should exploit one opportunity as a consequence of the evaluation process, but they are also faced with making the decision of which opportunity to exploit out of a range of opportunities. For potential entrepreneurs, these opportunities may not exclusively include entrepreneurial opportunities but also opportunities for employment, and these decisions may be differently influenced by emotions.

16.5.4 From the Decision to Exploit to Taking Entrepreneurial Action

We currently lack explanations of the process from being a potential entrepreneur to becoming a nascent entrepreneur, and there have been recent calls and first studies to go beyond investigations of opportunity exploitation by bridging the gap to entrepreneurial action (Kautonen et al. 2013). Because the process from decision to action incorporates both emotional and cognitive processes, it is important to investigate this link further here.

For instance, a recent study by Foo et al. (2009) demonstrated that positive and negative affect influence venture effort during the start-up phase. Another recent study by Doern and Goss (2013) showed that negative emotions, which were elicited by social interactions, triggered different forms of shame-related corrective appeasement behavior which corroded entrepreneurial motivation and direct attention and energy away from business growth and development. Hence, individual and social emotions can influence entrepreneurial action during the start-up and the subsequent evolution phases.

Furthermore, some studies have examined how entrepreneurs' emotions influence the entrepreneurial initiatives and actions of others. For example, Brundin et al. (2008) showed that entrepreneurs' displays of positive and negative emotions influenced their employees' willingness to act entrepreneurially. Another study by

Breugst and colleagues (2012) examined how the passion of a lead entrepreneur can impact commitment of employees to their entrepreneurial ventures.

Ultimately, scholars have made first advances in understanding the impact of and coping with negative emotional reactions due to business failure, regarded as the last entrepreneurial action in the entrepreneurial process. Several studies by Shepherd and colleagues (Shepherd 2003, 2009; Shepherd et al. 2009) have theorized and empirically examined ways in which entrepreneurs can cope and learn from situations in which the entrepreneur exits the business or the businesses itself is closed and the corresponding grief that is experienced. Another recent study by Jenkins et al. (2012) investigated individual differences in grief experience after firm failure. Using appraisal theory, this study demonstrated that the more the failure experience is appraised as stressful in terms of its implications for harm or loss, the greater the feelings of grief.

All these studies show different influences of emotions on various entrepreneurial action outcomes. Taking all these studies into account, there appears to be a need for a theoretical framework with a process lens. Morris et al. (2012) suggest such a framework. They propose an experiential perspective that provides a useful way to frame the temporal role of affect in venture creation, as the entrepreneur and the venture emerge as a function of ongoing experience. Entrepreneurs experience a temporal series of salient, interaction events that vary in volume (number of events), velocity (rate at which they are processed), and volatility (degree of intensity). Particularly, the velocity and volatility of the entrepreneurial experience is open for affective influence and valuable to integrate in future research. Moreover, Morris et al. (2012) suggest affective events theory (AET) (Weiss and Beal 2005; Weiss and Cropanzano 1996) as useful foundation for exploring the role of affect in the entrepreneurial process. AET argues that appraisals of events produce the experience of discrete emotions, which in turn influence attitudes and behavior.

16.6 Conclusion

While early reviews effectively highlighted the opportunity for new research in entrepreneurship, scholars have only recently begun specifying the mechanisms through which emotions and cognitions can impact entrepreneurial behaviors. These mechanisms do not appear to largely differ between entrepreneurial and other human behaviors. In fact, most emotion and cognition theories applied in entrepreneurship stem from the field of psychology. This chapter presented recent theories of emotions and cognitions that are applied in entrepreneurship research and summarized empirical findings on emotions and cognitions in the pre-entrepreneurial process. We hope that this chapter provides a promising starting point toward understanding the cognitive and affective effects of emotions on different phases of the pre-entrepreneurial process.

Although entrepreneurship scholars have recognized the importance to study the emotional and cognitive influences in entrepreneurship, we still lack a broad picture

across the many eclectic studies. While detailed studies are central for testing singular relationships, it may also be important to converge extant findings to grasp a more comprehensive understanding of the pre-entrepreneurial process and the entrepreneurial phenomenon in general. Hence, it may be a difficult but imperative task to develop an inclusive perspective that is empirically sound and theoretically relevant to advance future research in entrepreneurship.

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Chapter 17

Why? Attributions About and By Entrepreneurs

Kelly G. Shaver

17.1 Introduction

Attributions are the explanations people offer for the occurrence of events and behavior. The attributions made depend in part on the individual's vantage point and in part on that person's own motivations. This chapter begins with a general description of attribution processes, next considers how vantage point can influence attributional judgments, then turns to some of the errors and biases that originate from internal motivation, and finally provides examples of the way the attribution approach has been used in the study of the entrepreneurial mind.

17.1.1 *Origins of the Attribution Approach*

Why did that happen? Few endeavors are more human than the search for the meaning of events in one's physical and social world. Adequate understanding helps us to account for what has occurred in the past and to predict the future much more reliably. By contrast, inadequate understanding of the causes of events can be the basis for divorces, international conflicts, and the philosophical argument between evolutionary science and creationism. In the present context, the target of causal analysis is neither international nor philosophical, but rather is the more limited domain of business success or failure. Even there the goal is not to identify all the true causes of venture survival or demise, but to show how causal accounts offered by the people involved may serve as important contributing factors.

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The particular value of an attribution-based approach is in its ability to describe entrepreneurial performance in ways not reached by other psychological theories. As a prime example, consider the case of “habitual” entrepreneurs, people who start one entrepreneurial business after another. Many of these habitual entrepreneurs have enjoyed an unbroken string of successes, but many others have also had their share of failures. The psychological literature is chock full of motivational principles that explain why people continue to do something at which they are successful. But principles behind repetition of successes—such as that old standby, the principle of reinforcement (Skinner 1953)—are at a loss to account for starting over after failure, failure, and more failure. On the other hand, an entrepreneur’s beliefs about why failures have occurred can be the basis for persistence.

As a body of scientific inquiry, attribution is a description of how people answer the “why” question. Attribution theory (and its associated research) is the formal study of the sorts of explanations people give for the causes of events and behavior (their own and that of others). This area of inquiry is now more than a half-century old, as the beginnings are usually traced to the pioneering work of Fritz Heider (1958). In his book Heider offered a detailed explanation of the processes that individuals use to account for the causes of both events and behavior. For brevity, we shall concentrate on attributional explanations of human behavior, mentioning the causes of events only in passing where relevant. Notice that Heider’s objective was not to describe why behavior occurs, but rather to describe why people *think* actions occur.

In the literature this has been characterized as a “naive”—as distinguished from a “scientific”—explanation. The difference is more easily apparent today than it was in Heider’s time. At some level, the scientific explanations of human behavior are soon likely to involve functional magnetic resonance imaging (fMRI) that provides an image of the specific brain cells that are activated during one sort of thought or another. Whether such scientific explanations begin to hold sway or not, naive psychologists (read “ordinary people”) are likely to retain the terms provided by everyday language. To use some of Heider’s words, if we observe a person accomplishing a task, we say that the person “can” do the task, perhaps because his or her “ability” exceeds the “task difficulty” or perhaps because of “opportunity” or “luck.” We also believe that the person who accomplished the task was “trying” to do so in the sense of having an intention to succeed and exerting “effort” in the direction specified by that intention. Though we recognize that accidents happen, we are reluctant to believe that jobs are completed by accident, but rather that some level of willing participation by the actor was essential. Even in a future era of widespread fMRI, phrases such as “wanted to” and “tried to” are unlikely to disappear from everyday discourse.

Heider’s contribution was to identify how the various causal factors might be related to one another. Specifically, he argued that behavior was the consequence of an interplay between personal force and environmental force, the now familiar

$$B = f(P, E).$$

Four specific aspects of personal force have received the most attention, whereas two aspects of environmental force have been seen as central. On the personal side, ability is the skill or power that constitutes the individual's capabilities; trying is the motivational component, usually subdivided into intention and exertion. In the literature, these elements of personal force are also described as dispositional properties of the person, enduring characteristics that observers hope to infer from behavior. On the environmental side there is task difficulty (usually an impediment, though tasks can also be easy) and there is also luck (which can of course be either positive toward the outcome or negative). These are dispositional properties within the environment.

The creation of a new business venture is a process extending through time. It requires both resources and effort, all directed at a particular objective, with the process being brought back "on track," should it stray along the way. It is inconceivable that all of this could be accomplished by accident, so we are certain that personal causality, directed by intention, was centrally involved. So although the particular intentions behind entrepreneurial behavior (discussed in Chaps. 2, 4 and 6) are important, the question of whether there is any intention at all is usually not at issue.

Under these circumstances, it makes more sense to speak only of the "effort" component of trying. Thus, following Weiner et al. (1972), only ability, effort, task difficulty, and luck are usually considered in the attributional analysis of entrepreneurial action. The first two are dispositional properties of the person, the second two are dispositional properties of the external world. Within each of these categories, one element of force is stable (ability, task difficulty), whereas one element of force is variable (effort, luck). We shall return to some implications of this fourfold characterization in Sect. 17.4.2.

17.1.2 More About the Situation

Within a few years of the publication of Heider's pioneering analysis of the "naive psychologist," two prominent experimental social psychologists offered detailed (and testable) expansions of Heider's principles. In the first of these, Jones and Davis (1965) argued that beyond difficulty and luck there were two additional environmental forces affecting behavior. One of these is the set of prior actions the person has taken. The other is the set of behavioral alternatives that exist at the time the person chooses one action over another. Taking the person's past history and present alternative choices into account, Jones and Davis argue that we learn the most about the internal dispositions of the individual when he or she does something that is unexpected or, in their terms, out of role. An entrepreneur who makes a presentation to angel investors and asks for support is simply doing what is expected in (even demanded by) the situation. Performances like this tell us little about the entrepreneur's internal confidence in the venture. But one who says "government grants are paying for research and development, so we're simply letting you know

now that we'll be back" is doing something unexpected. That he or she would choose to do so suggests a much higher level of internal confidence. Thus the latter performance is more likely to whet an investor's appetite. And not merely because of the added credibility that government support provides the venture, but also because of what the claim says about the entrepreneur's own confidence in the enterprise. For present purposes, the primary contribution made by Jones and Davis's work is to lead us to take a more finely grained view of the environment.

17.1.3 A Model of Causal Judgment

The second expansion of Heider's basic ideas was the work of Kelley (1967, 1972, 1973). Among Kelley's ideas, two are of particular relevance here. The first is a principle of covariation that with deceptive simplicity argues that events and behavior will be attributed to factors that vary when the events or behavior go from absent to present. In an analogy to the statistical analysis of variance, Kelley's theory asks that we consider both main effects and interaction effects along three separate dimensions. The three are entities, time/modality, and persons. Experience suggests that these are more clearly described by illustration than by definition (but if definitions are needed, along with a comparison of Kelley's theory to that of Jones and Davis and that of Heider, please see Shaver 1975).

Put yourself in the role of a private venture investor (more of an angel than a professional venture capitalist). Over the course of several months a series of possible deals will come your way. Some will be restaurant concepts, others will be Web-based businesses, still others will be biotechnology. These various classes of potential investments are the entities. Because you belong to an organized angel investor group, some of the proposals will be made in front of the entire group. Some of these proposals will be informal, others will have that perfected "road show" quality. You may also come across possible investments at cocktail receptions (or those of us who teach students to make good "elevator pitches" are wasting our time). Or deals may come out of the blue, brought to you by fellow investors who would like to broaden participation. The ways in which opportunities present themselves are, in the theory's terms, the variations in time and modality: not all deals show up at the same time and the level of formality in presentation varies from one to the next. Finally, because you are a member of an investment group, there are other persons available to you for purposes of comparing impressions and notes.

Now for the main and interaction effects. Suppose you want to jump at every biotech start-up you discover, no matter how you heard of it, no matter how formal the presentation was, and no matter what other potential investors thought about the project. That is a main effect for the entity: Your desire to invest depends solely on the venture's being in a defined class of possible enterprises. Alternatively, suppose that regardless of the nature of the business being proposed or the way in which the pitch is delivered, you choose to invest only when accompanied by others whose judgment you trust. Then the cause of your investment decision is a main effect for

the persons dimension, not involving either entities or time/modality. Skipping to the most complex interaction effect (in this three-dimensional attribution world), suppose you elect to write a check only if (a) the company is a Web-based business that has (b) made a highly convincing formal presentation in front of the angel group (c) several others of whom have also agreed to invest. In this instance each of the dimensions plays a part—in conjunction with the others—in the investment choice.

Why does this sort of attributional analysis matter? Well, change your perspective to that of the entrepreneur seeking funding. To attract this particular investor, do you need (a) the right kind of business, (b) the right sort of presentation, (c) the right audience, or (d) some combination of the above? Recognizing that there are only 24 h in every day, you will want to make your “pitch time” as effective as possible, and that requires that you know something about the causes of a listener’s investment decisions.

The second of Kelley’s ideas about the nature of causal judgment that has implications for entrepreneurship is the notion of causal schemata, best described by the way in which it differs from the principle of covariation. Inherent in the principle of covariation is the idea that attributional judgments require multiple comparisons, often made over time. One entity is compared to another, one mode of presentation is compared to another, one person’s view of the world is compared to that of another person. One reason that the statistical analysis of variance is appropriate as a model for covariation is that the various comparisons are not unlike what a scientist might do to investigate the causes of an event. But, continuing Heider’s approach, people are naive scientists, ones who follow a limited version of the scientific method. More importantly, people—unlike scientists—are perfectly comfortable making definitive attributions without all the necessary evidence. Kelley argues that they do this by reference to causal schemata, mental models that fill in for missing data.

One such model is the schema for multiple necessary causes: at the simplest level, two necessary causes. Consider what is needed to make ice. Obviously, one requirement for ice is water, the other requirement for ice is an ambient temperature below freezing. Bitter cold without water produces no ice; water without freezing temperature remains water, even though it might get quite cold to the touch. Applications of the idea of multiple necessary causes to the entrepreneurial domain, however, are not always so simple. Indeed, they may be a matter of definition rather than a matter of universal agreement.

For example, think about what it means for an entrepreneur to be “in business.” Many naive psychologists (and more than a few business researchers) would say that an entrepreneur who has sold a product or service and has collected money would be “in business.” By this definition, selling something and collecting cash are the two necessary causes of being in business. There are, however, other definitions. Consider the Panel Studies of Entrepreneurial Dynamics (PSED, both I and II), described in books by Gartner et al. (2004) and Reynolds and Curtin (2009). In both data sets a nascent entrepreneur is defined as a person who (a) is currently in the process of organizing a business venture, (b) expects to own part of that venture, but

whose venture (c) has not generated sufficient income to pay a salary for the founder for longer than 3 months. Thus, within this research paradigm, it is not having sales that converts a person from a nascent entrepreneur into a “firm,” but rather having sales that are large enough for a long enough time. There are sound theoretical and empirical reasons for this particular definition, but it is still different from the definition offered by the naive psychologist.

In addition to the cognitive schema for multiple necessary causes, there are the more interesting schemata for multiple sufficient causes. These are cognitive representations of the fact that many physical and social events (or for that matter, behaviors) might be brought about in any of several different ways. An obvious example from entrepreneurship would be the failure of a newly formed company. A new business can fail if it is inattentive to its market, if the demands from its suppliers are too high, if there are already too many competitors in the local industry, if substitutes for its products or services can be obtained easily, if it burns too quickly through its cash reserves, or if it happens to be sabotaged from within. Readers will note that many of these accounts sound very much like Porter’s (1980) “five forces.” For present purposes it is sufficient to note that any, some, or all the problems might produce the death of the new firm.

The attributional problem is different depending on whether the presumed causes of an event are necessary or sufficient. When asked to explain the occurrence behavior or events that have only multiple necessary causes, an observer can easily “reason backward” to conclude that all the necessary causes must have been present. On the other hand, when asked to explain behavior or events that have multiple sufficient causes, the observer’s task is substantially more complicated. Now the task is to decide which of the multiple sufficient causes, alone or in combination, might have produced the event. Here Kelley argues that the judgments follow one of two schematic principles—discounting or augmentation. If there are multiple sufficient facilitative causes of an event or action, the discounting principle states that each will be reduced by some function of the number of possible multiple sufficient causes. If, however, some of the multiple factors are impediments to the occurrence of the event or action, and it occurs in the face of these impediments, then according to the augmentation principle, more weight will be given to the facilitative causes that are present. An entrepreneur who succeeds “against all odds” will be perceived to be even more capable than if success had come easily. Note that this perception of the entrepreneur as more capable may be correct, but it may not be.

17.2 Alternative Views of the World

As much as the various attribution theories ask us to pay attention to the situations that surround behavior, attributions are still mental constructions made by people, about people. Indeed, people are seen as the prototypical causes of events, and certainly of their own behavior. We shall consider this in more detail in a moment, but first, a bit of metatheoretical diversion. Having earlier referred to the principle of

reinforcement, readers familiar with the rest of Skinnerian behaviorism (Skinner 1953) will wonder whether it is philosophically correct to argue that people are the prototypical causes of events. In the behaviorist view of the world, there is no “action” in the usual (agentic) sense of the word. Rather, there is only “behavior,” itself conditioned entirely by the individual’s past history and current reinforcement setting. In other words, people only “respond,” they do not “do.” This disagreement between the behavioristic view and the view taken by attribution theory cannot be resolved by reference to data or even by an attempt to build an integrating theory that permits both views. Rather, the disagreement is on a metatheoretical level—the level of the philosophical assumptions on which theory is built. I have previously conducted an extended discussion of these issues (Chaps. 2 and 4 in Shaver 1985) and cannot repeat that discussion here. Suffice to say that the philosophical foundation of the attribution approach is libertarianism (not the political sort). The libertarian resolution of the dilemma of determinism relies on the writings of Reid (1863) and, later, Campbell (1957). The essence of the position has been captured by Feinberg (1981) who noted that “human actions, unlike other events in nature, are subject to a special kind of explanation: the actor’s own *reasons* for acting” (p. 329, emphasis in original). It is worth noting that legal systems in most of the world are based on assumptions that people have choices, make choices, and so should endure the consequences of bad choices (though none of these assumptions is congenial to the deterministic view of the world). As does the legal system, individual perceivers act as if they believe that people can make choices. Indeed, people are often even less forgiving than is the legal system. People’s proclivity to see others as the origins of their actions leads to two related errors in the attribution process.

Both errors arise from the fact that, as Heider (1958) noted, “behavior engulfs the field.” The first implication of this principle is that the world view of an actor is different from the world view of an observer. If you are attempting to organize a new business venture, you will concentrate on the obstacles facing you—the need to identify a market, the necessity of conquering the competition, the problem of generating enough cash to stay afloat. In short, as the actor in the setting, you will concentrate on everything that is going on around you and your business. You will see yourself, and describe yourself, as merely responding to the situational demands that are “out there.” The rest of us (observers), however, will pay less attention to what is going on around your business than we will to you and what you are doing. We will see you testing the market, erecting barriers to competition, and managing your income and expenses.

This difference in perspective leads to what is known as the “fundamental attribution error” (Ross 1977). This error is the pervasive tendency for observers to (a) overestimate the contributions of the person and (b) underestimate the constraints or contributions inherent in the external environment. More than a statement about the nature of causality, the fundamental attribution error is also a statement that perceivers make about the enduring dispositional properties of the actor. In a way most congenial to the libertarian philosophical view noted above, we will not only see you as doing things, we will see you as doing what you want to do. This is precisely where the question “what is being done?” turns into the attributional question “why

did you do that?" In the present context it should be pointed out that a version of this error could contribute to an investor's over-reliance on a management team and under-reliance on the nature of the product or service being proposed. Specifically, an entrepreneur's passion for a particular venture may be misinterpreted as an internal level of drive that could be applied successfully to some other venture. Because of Kelley's covariation principle, this assumption of internally based skills and tenacity is likely to be even stronger if the target person is a habitual entrepreneur with several successes to his or her credit. Yes, past behavior is very helpful in predicting future success, but it may not be quite as helpful as we think it might be.

17.3 Biases and Motivations

The fundamental attribution error is brought about by two facts: that we see human beings as agents and that not all human beings share identical perspectives on the actions taken or consequences produced. In short, this error is a product of the situations in which people find themselves, no matter who those people might be. There are, however, other complications in the attribution process that are the product of the internal motives of both actors and perceivers. These include self-serving biases, overconfidence biases, defensive attributions, and the need to believe in a just world. The first two are normally found among actors, the second two are normally found among observers.

Beginning with biases deriving from the motivations of actors, perhaps the most common is the "self-serving bias" (Bradley 1978). Deciding that a particular event is to be attributed to internal factors, or as Heider would describe it, personal force, has obvious implications for self-esteem. We like to think of ourselves as capable, perhaps a bit more capable than we really are. The result is that if something positive gets produced, we rarely take less credit than we deserve (normally, we take a bit more credit). On the other hand, if something bad happens, we prefer to talk about why it was not our fault. In short, we attribute successes internally, failures externally.

There is a long string of studies in the social psychological literature that supports this general conclusion, even when the "success" and "failure" are artificially created in the experimental laboratory. It is important to emphasize how many separate demonstrations of self-serving biases there have been, because in the entrepreneurial world, one often finds exactly the reverse: entrepreneurs seem to have no trouble saying things like "Well, it didn't work, but at least I can learn from my mistakes." In short, entrepreneurs appear to be acting counter to a very well established pattern. Nor do entrepreneurs (at least the very successful ones) take all the credit for themselves. Rather, they include everyone involved in the project among those to receive accolades.

What might be the difference between the self-attributions of entrepreneurs and the self-attributions in so many other instances? One possibility that suggests itself is the nature of the domain in which the success or failure has occurred. The

successes that are followed by self-aggrandizement are often personal performances of one sort or another, not performances of a business, the success of which clearly depends on factors outside the firm as well as on factors within the founder. As for denials of fault for failure, most of the research that shows such denials deals with moral failures, which are generally disapproved by society, rather than with business failures, which in the United States at least are often considered “the cost of doing business.”

Turning to motivated attributional biases within the perceiver, several have the strategic objective of protecting ourselves from harm. This very human tendency is reflected in the notion of a “need to believe in a just world” and in the idea of “defensive attribution.” Although the need to believe in a just world was originally developed to explain an observer’s tendency to hold accountable a truly innocent victim (Lerner and Simmons 1966), it also applies in the context of new venture creation. The basic idea is that in a “just” world people would not suffer for no reason. Often it is their own behavior that got them into trouble, and to the degree that this is obvious, the just world need would not come into play. Do stupid things, pay the price. No more explanation needed. The trouble begins when there is no stupid or dangerous behavior performed, but the target person still suffers. This situation suggests that we, too, might suffer through no fault of ours. The self-protective motive then takes over, and because bad behavior is effectively ruled out, we come to believe that the victim suffered because of being a “bad person.” If we see an entrepreneur fail at a venture that has plenty of financial and people resources, an excellent product appreciated by its customers, and no particularly effective competition, we wonder what could have happened. A small portion of our attributional mind says to itself, “was this a form of karma, retribution for some hidden character flaw?”

The need to believe in a just world is an attributional luxury available only to those who never expect to be in the entrepreneur’s shoes. For people who share the entrepreneur’s ambitions, interests, and work patterns—such as other entrepreneurs—a harsh statement about the victim’s character has the unfortunate potential to harm the self. Pointing one finger at someone else leaves three fingers pointing back at you. This possibility leads to a still more convoluted attempt at self-protection called defensive attribution. Although originally developed in the context of the attribution of responsibility for accidental occurrences (Shaver 1970), defensive attribution can also be seen in an entrepreneurial context.

An observer who never expects to be in the entrepreneur’s position (an investor, or a service provider, for example) is free to insist that the entrepreneur either made serious errors or was, in the just world sense, deserving of the negative outcome. On the other hand, a perceiver who is doing the same things (another entrepreneur, perhaps even in the same or a similar business) is wary of claiming that the victim made critical mistakes. Moreover, to the extent that the perceiver considers herself or himself personally similar to the target entrepreneur, the natural conclusion is “Good grief, I might have done exactly the same thing!” From this perspective, the failure will be bad enough in itself, no reason to add condemnation (by self or others) to the mix. Because of their differing perspectives, actors and perceivers are

likely to give discrepant explanations for success and failure. In addition to their differing perspectives, however, actors have internal motives (self-serving biases, defensive attribution) that are different from those of observers (needs to believe in a just world). Given their differences in perspective and motivation, it is almost a wonder that actors and observers ever agree on the causes of behavior or events.

17.4 Attributions in Venture Organization

To this point, basics of the attribution approach have been outlined and examples have been used to illustrate ways in which attribution processes could be involved in entrepreneurial behavior and performance. With this as background, we now turn to ways in which attribution has found its way into the research literature.

17.4.1 *Measuring Attributions*

As intuitively convincing as particular examples might be, there is an essential difference between reasoning by example and reasoning by reference to data. Only the latter provides scientific insight into the functioning of the entrepreneurial mind. Some attributional principles are easy to demonstrate in a scientifically acceptable way. For example, the fundamental attribution error is so easily reproducible that it has become a classroom illustration in social psychology courses. In such cases, half of a class of students is told “After completing the general education requirements and considering options for a college major, a good friend of yours has decided to major in accounting.” Then the respondent is asked to indicate a belief that this choice reveals (a) something about the person, (b) something about the major itself, or (c) neither. The other half of the class is given exactly the same information and response scale, with the sole exception that in the description of the major choice the words “a good friend of yours has” are replaced by “you have.” With great regularity, the friend’s choice produces a predominant response of (a), something about the person, but that alternative is almost never the predominant response for one’s own choice where (b), something about the major, is preferred.

It is one thing to use a simple experimental design to test for differences in the attributions made by actors and observers. It is something quite different to take the everyday descriptions offered by entrepreneurs and show that they can be characterized in clear attributional terms. Difficult, yes; impossible, no (Shaver et al. 2001). As noted above, the four primary contributors to the performance of intentional actions are ability, effort, task difficulty, and luck. Ability and effort are dispositional properties of the person, with ability considered “stable” and effort considered “variable.” In this context, stability does not mean permanence, as a person’s ability can, and often does, grow over time. But such growth takes a long time rather than changing from moment to moment. Effort, on the other hand, can be turned on

and off like a switch. Within the realm of environmental force, task difficulty is the stable element, whereas luck is the variable one. The four elements are usually considered as being represented by two conceptual dimensions—locus of causality (internal/external) and stability (stable/variable). The challenge is to use these dimensions to describe the explanations entrepreneurs provide for their desire to start a business.

In the PSED I, nascent entrepreneurs who had been identified through a random-digit-dialing screening procedure were interviewed by members of the University of Wisconsin Survey Research Laboratory. One of the very first interview questions asked was “Why do you want to start this business?” Respondents gave open-ended answers that the interviewers tried to capture verbatim. There were understandable variations in the personal shorthand systems interviewers used to try to accomplish this objective, and no doubt there were pieces of information that were lost. There was, however, no evidence of any systematic bias.

The attributional coding began with parsing of the entire response into separate thoughts using linguistic disjunctives like commas, periods, and words like “and” or “or.” Nearly 85 % of the respondents gave answers that included three or fewer elements. Elements containing personal pronouns, references to the self or to a personality characteristic were coded as internal to the person; elements with references to external factors such as the economy, competition, or demand were coded as external to the person. For the stability variable, answers were coded as stable if they described enduring properties of the person or environment that were unlikely to change in the short term. They were coded as variable if they had a decidedly probabilistic nature, could be changed from moment to moment based on whim, or depended to any substantial degree on the actions of other people. This brief description cannot do justice to the complexity of the coding process (which employed a coding manual in excess of 30 pages that included particular examples and the rationale for whatever code would be applied to that example). The procedure, however, produces inter-rater reliabilities above 0.90. Readers interested in further details are referred to the paper itself, which also includes an appendix containing two “training sets” of 50 items each that can be used to teach how the system should be used to produce reliable distinctions among internal and external, and stable and variable, causes.

17.4.2 Why Attributions Matter

Given that it is possible to measure internal versus external attributions with acceptable reliability, the next question is whether the attributional model is a valid description of entrepreneurial behavior. At least two studies suggest that the answer is affirmative.

The first of these two was a study of entrepreneurs who took advantage of the consulting opportunities made available by a large urban Small Business Development Center (Gatewood et al. 1995). As part of their initial client meeting

with the SBDC staff, female and male entrepreneurs completed a scale assessing their beliefs about personal efficacy and were asked why they wanted to start their proposed business. Responses to the “why” were coded by an early version of the procedure outlined above, one that separated the answers according to the two dimensions of locus of causality and stability. A year later the respondents were contacted again, and nearly 60% of them replied to a mail questionnaire. This mail questionnaire listed 29 separate activities involved in starting a business and asked how many hours the respondent had spent on each one. The 29 activities were grouped into five categories: gathering market information, estimating potential profits, finishing the groundwork for the company, structuring the company, and setting up business operations. Finally, all respondents were asked whether they had delivered their product or service to customers and collected the payment for it. (Obviously, this definition of “being in business” is simpler than the one used in the PSED research.)

Two findings from the study are particularly interesting. First, among the activities there was a significant bias in favor of action: respondents who reported being in business had, during the preceding year, devoted nearly 18 times the hours to setting up business operations than the respondents who did not meet the criterion for being in business. Second, thinking also helps, although it needs to be the right sort of thinking. Specifically, general beliefs about personal efficacy did not differ between respondents who had gone into business and those who had not. The attributions, however, showed important results that differed between men and women. Among people who had gone into business, females had (a year earlier) expressed reasons for wanting to be in business that had been coded as internal and stable. Among people who had gone into business, males had (also a year earlier) expressed reasons for wanting to do so that were coded primarily as external and stable. The coding had been done without knowledge of the sex of the respondent, so differences between explanations offered by men and women are an indication that the nature of the attributions matters.

A second illustration that attributions matter comes from a study of the problems and opportunities identified by small businesses on a survey done by a major metropolitan newspaper (Gartner and Shaver 2004). Newspaper surveys have obvious limitations in terms of such things as restrictions on the number of questions that can be asked, inability to collect much in the way of demographic information, and representativeness of the responses. On the other hand, they frequently do produce large numbers of data points. This particular research examined the responses of nearly 1700 business owner/managers to two questions: “What is the biggest opportunity facing your business?” and “What is the biggest problem facing your business?”

Answers were coded into the familiar dimensions of locus of causality and stability. Each respondent’s first-mentioned opportunity was coded into one of the four cells produced by the cross-classification of internal/external by stable/variable. The same coding was done for each respondent’s first-mentioned problem. Next, each respondent was placed into one of 16 cells based on (a) which of the four categories contained his or her first-mentioned opportunity and (b) which one contained his or

her first-mentioned problem. Where problems were concerned, by far the most frequent causal combination was external-variable. Where opportunities were concerned, the most frequent category was external-stable. Not surprisingly, the cell where these two codings intersect—external-stable for opportunities and external-variable for problems—was the most frequently occurring combination. Notice that this pattern is different from the one that would be expected to be self-serving (internal for failure, external for success). The difference may be that the self-serving pattern is usually offered to explain events in the past, where nothing can be done about the situation. Here, however, opportunities are in the future, so entrepreneurs would like to believe that they are “out there” and will remain so. By contrast, the problems (that are also “out there”) are variable. This pattern looks like an “enterprise-serving bias”: “Opportunities will be there when my business needs them, problems will either go away on their own or can be remedied.” Compared to respondents who had any of the other 15 possible attributional patterns, respondents in the enterprise-serving cell expected higher growth for the future. Whether such growth will be achieved is another matter, but it is important that the enterprise-serving bias was related to anticipated future growth. Overall, the research briefly summarized here adds to our confidence that entrepreneurial attributions (a) can be measured reliably and (b) have implications for both individual and firm performance.

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Chapter 18

Thoughts Have Consequences: Attributions By and About Entrepreneurs

Kelly G. Shaver

Ninety percent of all startups fail....

18.1 Introduction

We have all heard claims like this. Frequently, they are uttered by people who might *be* entrepreneurs, journalists, or venture investors, but who are completely unfamiliar with the relevant distinctions and data. But as we shall see in this chapter, thoughts like this one have important consequences for understanding who entrepreneurs might be or are, and why they actually do what they do.

The claim contains three critical elements: a stated percentage, a target referent (“startup”), and an outcome (“fail”). By itself, the “ninety percent” is probably true but uninformative in the same sense that the statement “100% of all human beings die” is true but uninformative. Of course human beings die; nobody lives forever. The important questions for individual human beings are *when* they will die and what will they *accomplish* in life before that eventual end overtakes them. Some companies still in business today were founded more than 300 years ago—Beretta (1526), Lloyd’s of London (1688), and Haig distilling (1627)—but it is a safe bet that well over 90% of the companies founded before 1700 no longer exist. Some new ventures being founded today may last for more than 300 years, most will certainly not.

In some quarters such as Silicon Valley, people like to claim in print (<http://www.forbes.com/sites/theyec/2012/08/15/are-you-building-a-small-business-or-a-startup/>) or in a video such as the one by Steve Blank (<https://www.youtube.com/>)

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[watch?v=CIA9ikESXYI](#)) that there is a crucial difference between a “small business” and a “startup.” The former is seen as little more than a lifestyle enterprise designed as income substitution. It is a replication of an existing business model with no real plans for the future, no large problem being addressed, and no particular interest in innovation or growth. By contrast, the latter is intended to be a “high impact” business begun by an entrepreneur who desires growth and innovation (Acs 2010; Stenholm et al. 2013), often by the application of some disruptive technology to a large problem. In an earlier time, such high-growth businesses were called “gazelles” (companies that were increasing revenues by at least 20 % for 4 years or more; Birch 1979, 1981). Though there is merit to the distinction, the fact remains that at the time that a Federal Employer Identification Number is issued, there is the birth of a new business. When the defining quality is governmental registration of a new enterprise, “startup” is a subcategory of “new business,” just as “small business” is another subcategory.

The definitional problem would seem to be a simple one. At the time of registration, the founder of a “small business” intends to replicate one of many existing business models in order to establish a sustainable income stream for the future. At the time of registration, the founder of a “startup” intends to create a continuously innovative business that will grow exponentially to solve a very large problem. The trouble is that a founder’s intentions are only moderately correlated (not *perfectly* correlated) with what happens in the business (Davis and Shaver 2012). Facebook was started on a very local level, without thought of its present ubiquity; it is widely reported that Fred Smith’s paper describing an overnight delivery service (which became FedEx) received a C grade in one of his economics courses at Yale; when John Mackey and Renee Lawson Hardy were bathing in the Hobart dishwasher in their natural foods grocery store, one suspects that they might not have anticipated what would become Whole Foods Market (<http://www.wholefoodsmarket.com/company-info/whole-foods-market-history>). So the market response to a new entrant may have substantially greater influence on whether a new business is scaled worldwide than the founder’s initial intentions. In other words, it is simple to distinguish a scalable high-impact business from a non-scaled lifestyle business *after* the fact. But if it were possible to do so in advance, all angel investors would be millionaires and venture capitalists would not need to admit that 40–50 % of their investments go bust. So for present purposes, should we be comfortable taking the founder’s opinion of whether a new registration is a “startup” or a “small business?” Probably not.

Finally, there is the question of “failure.” As entrepreneurship educators we certainly encourage our students to “fail early and often” on the assumption that the lessons one learns from adversity can be as valuable (if not more valuable) than the lessons one learns from success. In the tradition of the lean startup (Ries 2011), we encourage students to test their minimally viable products (MVPs) with target customers and to “pivot” if the customer response demands it. In the research literature on entrepreneurship, “failure” is frequently operationalized as filing for bankruptcy (e.g., Jenkins et al. 2014; Zacharakis et al. 1999), but this specific outcome is not the only one that could be described by “failure.” For example, Khelil (2016) has created a taxonomy of failure that includes such things as (a) persistence with an economically failing firm, (b) persistence in the face of the entrepreneur’s disappointment, and (c) persistence with both economic and psychological failure, as well as the total

failure represented by bankruptcy. In fact, the number of business bankruptcies in a year (an average of 40,329 in the 10 years from 2004 through 2013) (American Bankruptcy Institute 2015) is a small fraction of the number of small business deaths (an average over 750,000 per year according to the Small Business Administration 2015). Thus, even in government statistics, “failure” likely refers to cases in which there is psychological disappointment, not just total economic collapse. So, just as it is important to have a context for the percentage, and a conceptual definition for “startup,” it is important to say precisely what is meant by “failure.”

Recognizing that this level of academic detail is missing from the original assertion, let us now turn to what implications that assertion might have. Pretend that you were hearing that “ninety percent of startups fail” for the first time and consider a two-part thought experiment. First, imagine meeting a *successful* entrepreneur right after having heard the failure claim. What would you think of such a person? (This, of course, is the essence of attribution.) Where would you place the successful entrepreneur on a dimension of risk propensity? Social skills? Technical competence? Sales persuasiveness? Financial insight? Persistence? To what degree would you say that the person’s success derives from his or her abilities and motivation? We can almost hear you thinking, “succeeding against *those* odds must mean that the person is really special!” Now, turn to the second element of the thought experiment. Suppose that you, yourself, wanted to start a business. Given the presumed adverse odds, would you decide that the risks were simply too high? Would you elect instead to continue your corporate job?

To complete the thought experiment, suppose that instead of the “ninety percent” claim, I told you that in the United States there are over 28 million small businesses (SBA, 2014). What would you think about the ease of starting a new business now? What would you think about a successful entrepreneur? Perhaps more important, how likely would you be to consider starting a business yourself? Research in entrepreneurship shows that a wide variety of the activities and skills needed for success can be taught. These include enhancements to opportunity recognition (Chang et al. 2014; Clydesdale 2012) even though there is a genetic component (Shane and Nicolaou 2015), entrepreneurial intention (Palmer et al. 2015; Rauch and Hulsink 2015), or construction of business models (Jackson et al. 2015). All that is needed is for people to avail themselves of the educational and mentoring opportunities available at universities, incubators, accelerators, and training programs such as FastTrac®. But to take that step, people need to believe that there is some reasonable expectation that hard work will lead to success. As the thought experiment shows, the *attributions* for personality characteristics, for success, and for failure of self and others can be influenced by the starting context. Thoughts have consequences.

18.1.1 From “Naive Psychology” to “Folk Psychology”

As a body of scientific inquiry, attribution is a description of how people answer the “why” question. Attribution theory (and its associated research) is the formal study of the sorts of explanations people give for the causes of events and behavior (their

own and that of others). This area of inquiry is now more than a half-century old, as the beginnings are usually traced to the pioneering work of Fritz Heider (1958; also see the 50-year retrospective special issue by Rudolph and Reizenstein 2008). In that book Heider offered a detailed explanation of the processes that individuals use to account for the causes of both events and behavior. For brevity, we shall concentrate on attributional explanations of human behavior, mentioning the causes of events only in passing where relevant. Notice that Heider's objective was not to describe why behavior occurs, but rather to describe why people *think* actions occur.

In the literature this has been characterized as a “naive”—as distinguished from a “scientific”—explanation. The difference is more easily apparent today than it was in Heider's time, for two reasons. First, now there is an entire area of cognitive neuroscience that has begun to investigate the neural correlates of social cognition and social behavior (see, e.g., the special issue of *Cortex*, Rumiati and Humphreys 2015). Second, a comprehensive reexamination of some of the attribution distinctions we thought we understood (Malle 2006) has produced a significant change in the conversation about what attribution does and does not do. This reexamination will be discussed in more detail in a moment. For now, suffice it to say that the description “folk psychology” encourages us to look for the reasons behind action, not just the difference between “internal” (processes inside the individual) and “external” (characteristics of the situation). Whether explanations ultimately provided by cognitive neuroscience begin to hold sway or not, naive psychologists (read, ordinary people) are likely to retain the terms provided by everyday language.

To use some of Heider's words, if we observe a person accomplishing a task, we say that the person “can” do the task, perhaps because his or her “ability” exceeds the “task difficulty” or perhaps because of “opportunity” or “luck.” We also believe that the person who accomplished the task was “trying” to do so, in the sense of having an intention to succeed and exerting “effort” in the direction specified by that intention. Though we recognize that accidents happen, we are reluctant to believe that jobs are completed by accident, but rather that some level of willing participation by the actor was essential. Even in a future era of widespread fMRI, phrases such as “wanted to” and “tried to” are unlikely to disappear from everyday discourse.

Heider's contribution was to identify how the various causal factors might be related to one another. Specifically, he argued that behavior was the consequence of an interplay between personal force and environmental force, the now familiar:

$$B = f(P,E).$$

Four specific aspects of personal force have received the most attention, whereas two aspects of environmental force have been seen as central. On the personal side, ability is the skill or power that constitutes the individual's capabilities; trying is the motivational component, usually subdivided into intention and exertion. In the literature, these elements of personal force are also described as dispositional properties of the person, enduring characteristics that observers hope to infer from behavior. On the environmental side, there is task difficulty (usually an impediment, though tasks can also be easy), and there is also luck (which can of course be either positive toward the outcome or negative). These are dispositional properties out in the environment.

The creation of a new business venture is an activity extending through time. It requires both resources and effort, all directed at a particular objective, with the process being brought back “on track,” should it stray along the way. It is inconceivable that all of this could be accomplished by accident, so we are certain that personal causality, directed by intention, was centrally involved. So while the particular intentions behind entrepreneurial behavior (discussed in Chap. 2) are important, the question of whether there is any intention at all is usually not at issue.

18.1.2 Causes

In much of the social psychological literature, including some of my own work (e.g., Shaver 1975), discussion of the classic work in attribution proceeds in chronological order: Heider (1958), Jones and Davis (1965), and Kelley (1967, 1972, 1973). For our present purposes, however, a conceptual order makes more sense. As noted above, Heider’s pioneering work asked us to consider what factors would have to have been present for a particular action to occur. Specifically, Heider identified the elements (e.g., intention, exertion) that logically must distinguish the *personal causality* exercised by human agents from the impersonal causality inherent in physical systems.

By contrast, Kelley’s (1967, 1972, 1973) treatment of causal judgment asks us to become “naive scientists,” rather than naive psychologists. One of his key ideas, a principle of *covariation*, has often been described as an “ANOVA model,” a metaphor much more comfortable in science than in everyday language. The covariation principle argues with deceptive simplicity that events and behavior will be attributed to factors that vary when the events or behavior go from absent to present. The theory asks that we consider both main effects and interactions involving three separate dimensions. The three are entities, time/modality, and persons. Experience suggests that these are more clearly described by illustration than by definition (but if definitions are needed, along with a detailed comparison of Kelley’s theory to that of Jones and Davis and that of Heider, please see Shaver 1975).

Put yourself in the role of a private venture investor (more of an angel than a professional venture capitalist). Over the course of several months, a series of possible deals will come your way. Some will be restaurant concepts, others will be Web-based businesses, and still others will be biotechnology. These various classes of potential investments are the entities. Because you belong to an organized angel investor group, some of the proposals will be made in front of the entire group. Some of these proposals will be informal, others will have that perfected “road show” quality. You may also come across possible investments at cocktail receptions (or those of us who teach students to make good “elevator pitches” are wasting our time). Or deals may come out of the blue, brought to you by fellow investors who would like to syndicate participation. The ways in which opportunities present themselves are, in the theory’s terms, the variations in time and modality: not all deals show up at the same time and the level of formality in presentation varies from

one to the next. Finally, because you are a member of an investment group, there are other persons available to you for purposes of comparing impressions and notes.

Now, for the main and interaction effects, suppose you want to jump at every biotech startup you discover, no matter how you heard of it, no matter how formal the presentation was, and no matter what other potential investors thought about the project. That is a main effect for the entity: your desire to invest depends solely on the venture's being in a defined class of possible enterprises. Alternatively, suppose that regardless of the nature of the business being proposed, or the way in which the pitch is delivered, you choose to invest only when accompanied by others whose judgment you trust. Then, the cause of your investment decision is a main effect for the person's dimension, not involving either entities or time/modality. Skipping to the most complex interaction effect (in this three-dimensional attribution world), suppose you elect to write a check only if (a) the company is a Web-based business that has (b) made a highly convincing formal presentation in front of the angel group (c) several others of whom have also agreed to invest. In this instance, each of the dimensions plays a part—in conjunction with the others—in the investment choice.

Why does this sort of attributional analysis matter? Well, change your perspective to that of the entrepreneur seeking funding. To attract this particular investor, do you need (a) the right kind of business, (b) the right sort of presentation, (c) the right audience, or (d) some combination of the above? Recognizing that there are only 24 h in every day, you will want to make your "pitch time" as effective as possible, and that requires that you know something about the causes of a listener's investment decisions.

The second of Kelley's ideas about the nature of causal judgment that has implications for entrepreneurship is the notion of causal schemata, best described by its difference from the principle of covariation. Inherent in the principle of covariation is the idea that attributional judgments require multiple comparisons, often made over time. One entity is compared to another, one mode of presentation is compared to another, and one person's view of the world is compared to that of another person. One reason that the statistical analysis of variance is appropriate as a model for covariation is that the various comparisons are not unlike what a scientist might do to investigate the causes of an event. But people—unlike scientists—are perfectly comfortable making definitive attributions without all the necessary evidence. Kelley argues that they do this by reference to causal schemata, mental models that fill in for missing data.

One such model is the schema for multiple necessary causes. At the simplest level, two necessary causes consider what is needed to make ice. Obviously, one requirement for ice is water; the other requirement for ice is an ambient temperature below freezing. Bitter cold without water produces no ice; water without freezing temperature remains water, even though it might get quite cold to the touch. Applications of the idea of multiple necessary causes to the entrepreneurial domain, however, are not always so simple. Indeed, they may be a matter of definition rather than a matter of universal agreement.

For example, think about what it means for an entrepreneur to be “in business.” Many naive psychologists (and more than a few business researchers) would say that an entrepreneur who has sold a product or service and has collected money would be “in business.” By this definition, selling something and collecting cash are the two necessary causes of being in business. There are, however, other definitions. Consider the Panel Study of Entrepreneurial Dynamics (PSED, both I and II), described in books by Gartner et al. (2004) and Reynolds and Curtin (2009). In both datasets, a nascent entrepreneur is defined as a person who (a) is currently in the process of organizing a business venture and (b) expects to own part of that venture, but whose venture (c) has not generated sufficient income to pay a salary for the founder for longer than 3 months. Thus, within this research paradigm, it is not having sales that changes a person from a nascent entrepreneur into a “firm,” but rather having sales that are large enough for a long enough time. There are sound theoretical and empirical reasons for this particular definition, but it is still different from the definition offered by the naive psychologist.

In addition to the cognitive schema for multiple necessary causes, there are the more interesting schemata for multiple sufficient causes. These are cognitive representations of the fact that many physical and social events (or for that matter, behaviors) might be brought about in any of several different ways. An obvious example from entrepreneurship would be the failure (here, bankruptcy) of a newly formed company. A new business can fail if it is inattentive to its market, if the demands from its suppliers are too high, if there are already too many competitors in the local industry, if substitutes for its products or services can be obtained easily, if it burns too quickly through its cash reserves, or if it happens to be sabotaged from within. Readers will note that many of these accounts sound very much like Porter’s (1980) “five forces.” For present purposes it is sufficient to note that any, some, or all the problems might produce the demise of the new firm.

The attributional problem is different depending on whether the presumed causes of an event are necessary or sufficient. When asked to explain the occurrence behavior or events that have only multiple necessary causes, an observer can easily “reason backward” to conclude that all the necessary causes must have been present. On the other hand, when asked to explain behavior or events that have multiple sufficient causes, the observer’s task is substantially more complicated. Now, the task is to decide which of the multiple sufficient causes, alone or in combination, might have produced the event. Here Kelley argues that the judgments follow one of two schematic principles—*discounting* or *augmentation*. If there are multiple sufficient facilitative causes of an event or action, the discounting principle states that each will be reduced by some function of the number of possible multiple sufficient causes. If, however, some of the multiple factors are impediments to the occurrence of the event or action, and it occurs in the face of these impediments, then according to the augmentation principle, more weight will be given to the facilitative causes that are present. An entrepreneur who succeeds “against all odds” will be perceived (especially by someone who believes that 90% of all startups fail) to be even more capable than if success had come easily. Note that this perception of the entrepreneur as more capable may be correct, but it may not.

18.1.3 Traits

Technically, a judgment about the entrepreneur's capability is an assertion that the entrepreneur possesses a particular *trait* (or combination of traits). In the attribution literature, the discussion of traits ("dispositions") needs to begin with the work of Jones and Davis (1965). These authors assumed that at the time an individual takes action, that behavior is the result of a choice between the act performed and a (sometimes extensive) set of alternative things the person could have done instead. Some of these alternate choices would have produced comparable outcomes (what Jones and Davis called "common effects"), but some of the alternates would have produced quite different outcomes ("noncommon effects").

Suppose, for example, that an angel investor uses the scorecard method (assessment of the entrepreneurial team; the size of opportunity; the product; the competitive landscape, sales, and marketing; and the need for additional rounds of investment) to compare two software companies as investment candidates. Further suppose that the final adjusted weighting is identical. So the method itself shows what elements are common to the two investment choices. Yet the angel investor still picks one over the other. Unless the choice was made by flipping a \$20 gold piece, we assume that the investor's decision was guided by *some* noncommon effect, likely one that matters only to this potential investor.

Behavioral performances are made in the context of a person's prior choices and the demands of the present situation. So according to Jones and Davis's *correspondent inference theory*, we learn the most about an individual's inherent traits only when that person performs a behavior that has very few noncommon effects, most of which are assumed to be of low desirability in the situation. In other words, we learn the most about the internal dispositions of the individual when he or she does something that is unexpected or, in their terms, *out of role*. An entrepreneur who makes a presentation to angel investors and asks for support is simply doing what is expected in (even demanded by) the situation. Performances like this tell us little about the entrepreneur's internal confidence in the venture. But one who says "government grants are paying for research and development, so we're simply letting you know now that we'll be back" is doing something unexpected. That he or she would choose to do so suggests a much higher level of internal confidence. Thus, the latter performance, which corresponds to the disposition presumed to underlie the action, is more likely to whet an investor's appetite. And it is not merely because of the added credibility that government support provides the venture but also because of what the claim appears to say about the entrepreneur's own confidence in the enterprise.

Two different sorts of errors can arise in our judgments of people's behavior and the setting in which it occurs. First, in his original discussion of the issue, Heider (1958) noted our tendency as humans to see each other as agents by asserting that "behavior engulfs the field." Specifically, when we are viewing a person's actions, we tend to concentrate on what we observe, paying less attention than we should to the situation in which that behavior occurs. In terms that were used by Jones and his colleagues (Jones and Harris 1967), there is a "correspondence bias," a tendency to infer stable

traits from behavior, whether that behavior is in role or out of role. This tendency is sufficiently pervasive that Ross (1977) called it the *fundamental attribution error* (FAE). According to Gilbert and Malone (1995), however, there are cases in which ignoring the situational pressures may do little damage to the observer's judgments. As one example, they note that in terms of predicting the behavior of the night manager of an inner-city convenience store, it matters little whether the manager's apparent distrust is a product of the situation or of an internal disposition.

The second error, sometimes incorrectly conflated with the fundamental attribution error, is what has been called the *actor-observer* divergence or asymmetry (Jones and Nisbett 1971). Rather than a trait inference based on an incorrect calculus of the relative contributions of person and situation (the FAE), the actor-observer asymmetry is a perceiver-based difference in the asserted importance of situational pressures. Specifically, Jones and Nisbett (1971) argued for a "pervasive tendency for actors to attribute their actions to situational requirements, whereas observers tend attribute the same actions to stable personal dispositions" (p. 2). If you are attempting to organize a new business venture, you will concentrate on the obstacles facing you—the need to identify a market, the necessity of conquering the competition, and the problem of generating enough cash to stay afloat. In short, as the actor in the setting, you will concentrate on everything that is going on around you and your business. You will see yourself, and describe yourself, as merely responding to the situational demands that are "out there." The rest of us (observers), however, will pay less attention to what is going on around your business than we will to you and what you are doing. We will see you testing the market, erecting barriers to competition, and managing your income and expenses.

There have been two methods typically adopted to assess the relative contributions of the person and the environment. The first is simply to define personal characteristics as "personality, traits, personal style, attitudes, mood, and so on" (Storms 1973, p. 168) and then ask how important those characteristics were in comparison to specifics of the situation. Compared to a single scale with "something about the person" as one end point and "something about the situation" as the other end point, this two-element question has the advantage of allowing the possibility that both the person and situation could have been involved in the production of action.

The second way of distinguishing personal causes from situational ones is to hark back to some of Heider's (1958) original description of action. Specifically, ability and effort would be considered internal to the person, whereas task difficulty and luck would be considered external factors constraining a performance. In an attributional analysis of achievement motivation, Weiner et al. (1972) argued that these four elements could be arrayed as a fourfold table, with ability and difficulty being *stable* dispositional properties of, respectively, the person and the situation and effort and luck being *variable* properties of, respectively, the person and the situation.

In entrepreneurship research, Shaver et al. (2001) used this fourfold classification scheme to examine the answers that entrepreneurs in the first Panel Study of Entrepreneurial Dynamics (PSED, Gartner et al. 2004) provided to the question, "why do you want to start this business?" The attributional coding began with parsing of the entire response into separate thoughts using linguistic disjunctives like

commas, periods, and words like “and” or “or.” Nearly 85 % of the respondents gave answers that included three or fewer elements. Elements containing personal pronouns, references to the self or to a personality characteristic, were coded as internal to the person; elements with references to external factors such as the economy, competition, or demand were coded as external to the person. For the stability variable, answers were coded as stable if they described enduring properties of the person or environment that were unlikely to change in the short term. They were coded as variable if they had a decidedly probabilistic nature, could be changed from moment to moment based on whim, or depended to any substantial degree on the actions of other people. This brief description cannot do justice to the complexity of the coding process (which employed a coding manual in excess of 30 pages that included particular examples and the rationale for whatever code would be applied to that example). The procedure, however, produces inter-rater reliabilities above 0.90. Readers interested in further details are referred to the paper itself, which also includes an appendix containing two “training sets” of 50 items each that can be used to teach how the system should be used to produce reliable distinctions among internal and external, and stable and variable, causes.

The fourfold classification has led to some successes in entrepreneurship research. In one, Gatewood et al. (1995) asked Small Business Development Center (SBDC) clients why they wanted to go into business and categorized answers according to the fourfold classification. Then a year later, the clients were asked how many of 29 separate business startup activities (many of which subsequently found their way into the PSED) they had performed and how many hours they had devoted to each activity. Not surprisingly, there was a bias in favor of action. Respondents who reported being in business had, during the preceding year, devoted nearly 18 times the hours to setting up business operations than the respondents who did not meet the criterion for being in business. Second, thinking also helps, although it needs to be the right sort of thinking. Specifically, general beliefs about personal efficacy did not differ between respondents who had gone into business and those who had not. The attributions, however, showed important results that differed between men and women. Among people who had gone into business, females had (a year earlier) expressed reasons for wanting to be in business that had been coded as internal and stable. Among people who had gone into business, males had (also a year earlier) expressed reasons for wanting to do so that were coded primarily as external and stable. The coding had been done without knowledge of the sex of the respondent, so differences between explanations offered by men and women are an indication that the nature of the attributions matters.

Internal and external attributions were also the subject of a study by Rogoff et al. (2004). These investigators asked two sets of entrepreneurs to identify the factors that contribute to their venture success and the factors that impede such success. They also asked a panel of experts the same two questions. The results showed that for the two sets of entrepreneurs (one sample of pharmacists, one more broadly based sample of business owners), business success factors were overwhelmingly attributed to internal factors (more than 90 % in each sample). On the other side of the coin, both sets of entrepreneurs identified external factors (in excess of 80 % as

those acting to impede the success of their businesses. By contrast, the business experts identified more internal impeding factors, and the authors take this difference as evidence for the actor-observer hypothesis.

Results are not always this positive. A study by Diochon et al. (2007) based on the Canadian version of the PSED asked open-ended questions about why the business was being started, why it was expected to be successful, what problems had been experienced, and what problems were expected. The investigators used the Shaver et al. (2001) procedures to categorize responses into the fourfold table. In each instance, only the respondent's first answer was coded, as a reflection of what was most salient to the person. Interestingly, the results were mixed. Positive outcomes were, as predicted, attributed to internal stable causes. But current and expected problems were most frequently attributed to *internal* variable causes.

Another use of the fourfold table (Gartner et al. 2008) approach in entrepreneurship used open-ended answers to two different questions asked in PSED I. One question, asked in the mail questionnaire portion, was "Briefly, how did the original idea for starting a business develop?" The other question, asked in the prior telephone survey, was "What major problems have you had in starting this business?" Respondents' answers were coded according to the fourfold scheme. In accordance with the predictions, entrepreneurs offered accounts for opportunities that were either internal and stable or internal and variable. In other words, opportunities were seen as "within the control of the individual—*ability* is a characteristic I already have, while *effort* is something that I can do" (p. 311). In contrast, problems were seen as variable, either a lack of effort (internal) or bad luck (external). Note that problems were seen as variable, as they had been in the Diochon et al. (2007) study. (A personal note here: having spent many years studying the attribution of responsibility and blame, one of the first things to attract me to entrepreneurship was the fact that—unlike those with moral failures—entrepreneurs with business failures accept responsibility and learn from their mistakes.)

18.1.4 Reasons

Despite some successes, at least two comments can be made about the fact that Shaver et al.'s (2001) coding manual to separate internal from external and stable from variable required 30 pages to be clear. At the time, the positive comment would have been, "wow, that's a lot of work." Now, in light of research published since 2005, there is unfortunately a less charitable possible comment: the very difficulty of making the internal/external distinction suggests that the fourfold table approach fails to capture the attributions that are critical.

The primary argument against continuing to concentrate on the internal/external characterization of behaviors and events comes from Malle's (2006) meta-analysis of the actor-observer hypothesis. This meta-analysis began with a search that spanned 35 years of four databases for the words "attribution" and "actor" or "observer" anywhere in the title, abstract, or keywords. To the roughly 700 articles

identified in this way, Malle added about 900 additional titles that had cited the original Jones and Nisbett (1971) paper. Of this overall total, 250 were selected that appeared to be empirical studies assessing attributions of both actors and observers. Well over a 100 of these failed to include all of the terms or statistical measures sufficient to reconstruct effect sizes. The final sample was 113 articles reporting 173 studies on a total of 14,686 participants. The results of the meta-analysis showed that, independent of the way effect sizes were estimated, “the classic actor-observer asymmetry was very small or non-existent. In the units of the correlation coefficient ... the actor-observer asymmetry ranged between $r = -0.01$ and $r = .05$ ” (p. 900).

If the actor-observer asymmetry is no longer regarded as viable, what is to become of the internal-external distinction? The answer is that it, too, may be much more limited than first thought. Malle’s meta-analysis did find that whether an outcome was positive or negative moderated the use of internal versus external attribution. In other words, it still does seem to apply in cases of success and failure, where people make self-serving attributions (Bradley 1978) by tying their successes to their own efforts and their failures to factors outside themselves or their control. And some form of internal attribution is a precondition either for deciding that a particular person was the cause of an event or for deciding that the person possesses one sort of trait or another.

Where the distinction between internal and external loses its force is in a perceiver’s attempt to determine *why* a particular action was performed. The fact *that* an event was caused by a person might be discovered through processes of covariation of causes; the inference (correspondent or not) of a *trait* assumes both internal causality and intentional action. But if the question is more like “why did the person act that way?” an automatic assumption that it was because of an underlying trait probably does not do sufficient justice to the complexity of human thought.

To return, again, to Heider (1958), the central feature in personal causality is intention. Using terms from Heider’s theory, Shaver (1975, 1985) pointed out that intentional action is goal directed, and that there is what Heider referred to as “local causality”—the continuous exercise of goal-directed effort—during the performance, to ensure that the goal is actually reached (which Heider called “equifinality”). Or, as Malle and Knobe (1997) have described it, an action is considered intentional when the agent had a desire for a state to be produced, a belief that a particular action would bring about that state, and an awareness of fulfilling the intention while performing the action. What all this suggests is that in addition to causes and traits, attributors need to consider the *reasons* behind intentional action.

In entrepreneurship research there is a long tradition of considering the reasons people invoke for starting businesses. Beginning with a study by Scheinberg and Macmillan (1988) and continuing to the present, researchers have compared the reasons that people offer for going into business to success in organizing a business or performance of new ventures that have already been organized. Both PSED I, which lasted for 4 years, and PSED II (Reynolds and Curtin 2009), which assessed respondents for 6 years, included some version of the “career reasons” originally traced to Scheinberg and Macmillan (1988) and modified by Shane et al. (1991), Birley and Westhead (1994), Carter et al. (2003), Davis and Shaver

(2009), and Shaver et al. (2014). There have been as many as 38 such reasons used (Scheinberg and Macmillan 1988) and as few as 14 (Davis and Shaver 2009, using all that were present in the combined PSED I and PSED II). Factor analyses of these reasons have produced as many as six factors (Carter et al. 2003, 2007) and as few as two factors (Shaver et al. 2014). Regardless of the factor structure obtained, the items themselves address such things as financial goals, independence, what would now be called “work/life balance,” and family traditions. One caveat is, however, because the career reasons were asked on subsequent waves in the PSED, there is some evidence that they change over time, as the venture becomes operational (Cassar 2007).

In addition to the career reason variables (which are especially useful because they are phrased in a manner that allows them to be used with non-entrepreneurs as well as entrepreneurs), the PSED studies include other goal-related items that could easily be interpreted as answers to questions about an entrepreneur’s exercise of personal causality. For example, respondents were asked how many business ideas they considered before arriving at the one being followed, how long they would give “maximum effort” to establish the business, how much time and money they would give to the business organizing effort, and what their expectations were for long-term growth of both revenues and employees. In terms of attribution theory, these items reflect intentions, effort, persistence, and local causality. They do not measure traits of the entrepreneurs, though there are also items dealing with expectancy (Gatewood 2004), decision-making style (Johnson et al. 2004), and locus of control (Schjoedt and Shaver 2012; Shaver 2004).

18.2 Recent Examples

A recent search of the Business Source Complete database for any articles whose abstracts contain both the word “attribution” and the word “entrepreneurship” identified fewer than 20 articles; a corresponding search for the combination of “career reasons” and “entrepreneurship” produced nothing in the last few years. As a result, the “recent examples” are limited to causes and traits.

18.2.1 Causes

Every year in Japan the National Life Finance Corporation (NLFC) conducts a large-scale survey of new ventures. Yasuhiro et al. (2015) used “The Survey of Entrepreneurs Starting Businesses for the Second Time” a follow-up to the original NLFC survey to examine failure experiences. Items in the questionnaire included several that were categorized as “internal” (e.g., lack of management know-how or entrepreneurial skills) and others categorized as “external” (e.g., changes in consumer demands or shifts in business customs) causes of failure (as an aside,

Yasuhiro, Peng, and Deeds made the frequent mistake of calling these internal or external attributions of “blame” rather than causality) (see the extended discussion by Shaver 1985). Results of this study showed higher growth in subsequent ventures by entrepreneurs who expressed internal causes for failure, especially if the number of prior failures was small.

Based on a search for public press accounts of venture failure in six regional (and one national) newspapers, Cardon et al. (2011) identified 389 cases of entrepreneurial failure. They then used discourse analysis to analyze the newspaper accounts for statements identifying the failure’s cause. They report that failures overall were “blamed fairly evenly on mistakes and misfortunes” (p. 80). (Again, this is an inappropriate use of the word “blame.”) The misfortunes were things outside the control of the entrepreneur, such as a poor economy or a natural disaster, whereas the category of mistakes included “inadequate ability or effort, improper strategies, or poor business models” (p. 82). Results of the discourse analysis showed that regions differed substantially in their relative proportions of misfortunes to mistakes. Chicago, New York, and Washington, D.C., had higher proportions of mistakes; Atlanta, Austin, and San Francisco had higher proportions of misfortunes. What is particularly interesting from our perspective is that cities with higher proportions of attributions to the entrepreneurs (New York and Washington, D.C.) actually had lower failure rates overall than did cities with lower proportions of attributions to entrepreneurs (Austin and San Francisco). There is, of course, a certain chicken-and-egg problem in attempting to interpret these results. It could be that if failure rates are low, entrepreneurs have to do something wrong to fail, but it could also be that if the community is poised to hold entrepreneurs responsible for failure, the risks of starting are so high that few disruptive innovations are attempted.

18.2.2 Traits

Any time that parties to an interaction have goals that are less than perfectly aligned, there is the potential for faulty attribution of motives and traits. One such example of an interaction with divergent goals (what the social psychological literature might describe as a “mixed-motive game”) is the relationship between entrepreneurs and the initial investors in their ventures. Entrepreneurs and investors must depend on each other, but the inevitable disagreements must be carefully managed if both parties are to remain committed to the relationship.

Collewaert and Fassin (2013) examined 11 cases in which there had been a conflict between the entrepreneurs and their venture investors. These investigators conducted face-to-face semi-structured interviews, followed by email and telephone contacts and study of additional company information from prior surveys and required business filings. Among other things, respondents were asked to identify examples of “unethical behavior” such as unfair communication, investments in competitors without forewarning, failure by entrepreneurs to bring in promised

assets, or deliberate falsification of information. In many of the cases, the unethical actions led to attributions of blame (“blame” is correctly used in this circumstance) that were often followed by the dissolution of the partnership. The lesson here is that perceptions that conflict arose from unethical behavior were more important than the conflict per se in producing unhappy endings.

18.3 “Ninety Percent of Startups Fail”

Having begun the beginning with a thought experiment, let us begin the end with a suggestion for a class demonstration. First, survey both print and social media to identify entrepreneurs who get a lot of press. Put all of these names, plus the name, “someone I know personally” on a presentation slide. On the first day of your entrepreneurship class, tell the class that you will ask them to write down a name as quickly as they can and that anyone who does so correctly will receive five extra points on the final exam. (I have played this game with MBA students, but have used cash instead of points.) Then ask the class to “write down the name of an entrepreneur.” Next, tell the class that if you can guess what they have written down, they lose. As long as the presentation slide includes “someone I know personally,” the vast majority of the class will lose. This is more than a simple demonstration of the availability heuristic (Tversky and Kahneman 1974; also see Braga et al. 2015; Mase et al. 2015). Each of the named entrepreneurs is a prototype (Rosch 1973; also see Costa et al. 2015) that represents at least (a) a presumed collection of personal characteristics, (b) a particular industry, and (c) a level of success achieved. In other words, it gathers in one place a set of attributions about personal traits and causes of success. This is the cognitive “standard” against which each student will first assess his or her suitability for entrepreneurial endeavors and her or his likelihood of success. What you hope to do in your course is provide information and experiences that will bring each student’s personal view more in line with reality.

An entrepreneurial venture cannot succeed if it is not begun, so an entrepreneur’s decision to start is absolutely critical. That decision will be affected by the entrepreneur’s beliefs about what personal traits are needed and whether she/he has them. Once started, an entrepreneurial venture only very rarely can be scaled without external financial support, provided by investors who have their own unique views of the required traits and likely causes of success. Potential venture investors are fond of saying that they “prefer an A-level team with a B-level idea to a B-level team with an A-level idea.” It is worth noting, however, that the investors, like the would-be entrepreneurs, have beliefs about the collections of traits necessary that are unlikely to have been informed by an understanding of the principles of attribution and the errors that can arise in judgments of causality for events. Thoughts have consequences. We can only hope that those thoughts will reflect the world as it really is, not an unexamined view that “ninety percent of startups fail.”

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Chapter 19

Self-Efficacy: Conditioning the Entrepreneurial Mindset

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19.1 Introduction

Since Bandura's original work (Bandura 1977a), the self-efficacy concept has become an important variable within social psychology research. However, it has also been invoked in numerous other areas of research: organization theory, human resource theory, cognition and behavioral theory, as well as identity theory, in connection with topics such as health, stress, leadership, commitment, ethnicity, religion, gender, culture, social class, because it emphasizes values that we perceive as important in the Western world such as achievement and performance (Gecas 1989).

The literature addressing the self-efficacy concept is thus enormous and continuously growing. Hence, a complete review of the psychology literature on self-efficacy is outside the scope of this chapter. However, the prolific interest in the concept indicates its potential. Nevertheless, although much of the work underpins the importance of predicting and improving performance and enhancing specific behavior in the various fields, much still remains unclear about the antecedents of self-efficacy and the processes that produce and reinforce self-efficacy. Further, research has predominantly been concerned with measuring levels of self-efficacy ex ante and ex

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post some participation in an experimental setting (see, e.g., Zimmerman et al. 1992 for an exemplar). In other words, research that addresses the underlying determinants of self-efficacy has been much less widespread (Gist and Mitchell 1992).

The aim of this chapter is twofold: First, it seeks to broaden our understanding of the self-efficacy concept. Second, it develops suggestions for new avenues of research into the self-efficacy concept. It sets out to achieve these objectives through an exploration of the origins of the concept, moving on to its impact in the field of entrepreneurship. After a short summary of the chronological development, the chapter will focus on three main issues around entrepreneurial self-efficacy: its measurement, its impact as an influencing factor, and its antecedents, which will finally lead to suggestions for understanding the pedagogy needed to promote entrepreneurial self-efficacy in the different social arenas of life.

19.2 The Psychological Origin of Self-Efficacy

Albert Bandura's social cognitive theory of self-efficacy refers to individual's assessment of their competences and ability to overcome adverse conditions and obstacles and the belief that future actions will be successful (Bandura 1977a, 1986, 1997). According to Bandura (1986), self-efficacy concerns the extent to which an individual believes in his or her capabilities to mobilize the motivation, cognitive resources, and causes of action needed to meet given situational demands. These beliefs influence "what challenges to undertake, how much effort to expend the endeavor (and) how long to persevere in the face of difficulties" (op. cit., p. 29). Thus, an individual's self-efficacy reflects the impact of past experiences on his or her assessment of capacity for performance attainment.

Bandura operates with two types of assessments or expectations: efficacy and outcome expectations (Bandura 1977b). The former refers to a belief about an individual's own competence that she/he can successfully perform a certain action and has been addressed extensively by research over the years, both out- and inside entrepreneurship. The latter refers to an estimate about the social system's responsiveness to that action. This distinction is important because if an individual perceives the social (or political) system as being unresponsive or unappreciative of entrepreneurial action then there is no need for behaving entrepreneurially, even if that individual feels that she/he has the competence and ability to achieve the desired objective. Thus, the environment's positive responsiveness is penultimate to action. Research into this part of the equation is rare, if it exists at all.

However, whether the assessment of both self-efficacy and outcome expectations is positive or negative is predominantly dependent on the preference for or resistance to a particular behavior that each individual has built up (Stern 1985). If something is perceived as a dangerous or risky behavior then an individual is likely to abstain from carrying out this behavior. A preference for or resistance to a particular behavior is built up through somatic markers (Damasio 1994; Bechara and Damasio 2005).

19.2.1 Somatic Markers and Self-Efficacy

The theory of somatic markers is concerned with associating emotions with events (Damasio 1994). Likewise, somatic markers will build up in an individual and the predominance of either the positive or the negative experiences associated with a particular behavior will dominate the individual's choice of reaction. Hence, the first time a person meets a certain feedback she/he will use this to refer back the next time a similar or same feedback is experienced. Thus, if a girl climbs a tree and falls down hurting herself then her mother has two options: either to create a positive somatic marker for "failing fast"—oh, that hurt but that is what may happen when you climb a tree—get back on the horse and practice. Or she can run to the rescue and say "never ever do that again, it is so dangerous to climb trees." The former creates a positive somatic marker, the latter a negative one for experimenting. If the mother does this every time the little girl tries something that might hurt her or she might fail to do, then she may gradually build a resistance to attempt risky behavior. Basically, the process can be likened to a washbasin with a plug and a dripping tap. On its own a drip is just a drip. But if drips are collected the basin fills up. Further, a drip can be either warm or cold. Whether the water is ultimately warm or cold depends on the predominance of one or the other (not taking into account evaporation and a general cooling of warm water!). And that is what happens: drips of somatic markers are stored in the subconscious, deep within the inner system of our brains. Thus, abstaining from a certain action is not necessarily a conscious act, but rather a subconscious one. Somatic markers become reinforced throughout our lives and our choices in life will reflect our individual "stores" of somatic markers (Damasio 1994).

Damasio is, however, not sufficiently precise in describing how this process takes place and how it becomes internalized. Stern (1985), on the other hand, delivers an explanation in his theory of "representations of interactions generalized" (RIGs). RIG is a developmental psychological term about how people build notions of others. It starts the minute the baby is born and continues all through our lives. The basic premise of this theory is that in order to navigate in the world, all the impressions of events and individual reactions that we meet in our lives are interpreted, internalized, and eventually generalized. Every time we meet something or someone, then this meeting builds on what previous experiences we have had with this something or someone, simply because we cannot continue to build new impressions. It is a way to create a continuous and "normal" picture of others, against which we perceive new impressions of them. The reason we can experience something as "different" is because we have a memory (our RIG) of what it usually is like. These RIGs can produce either positive or negative memories, or as Damasio calls them guiding stars or black holes (Damasio 1994). Whether they function as one or the other means that individuals, without thinking about it, will avoid negative somatic markers before they even become a possibility. It entails that the emotions and feelings that are connected to certain results and those results that produce positive emotions and feelings in us will be preferred over those that produce

negative emotions and feelings. Thus, they may be seen as personality shaping as well as behavior ruling. It also entails that being conscious about your RIGs is an underlying mechanism of potential change.

Thus, unknowingly, the parents of the little girl may be conditioning her mind against undertaking any risky behavior and this may in time translate into a disposition not to become an entrepreneur because this is often portrayed as a risky behavior. This means that in order to break such a pattern, it is necessary to find methods of “unconditioning the mind”—of displacing the cold water with warm and further at a greater speed than that with which it was originally built up. Research consistently shows that women score lower on self-efficacy than men (Hackett and Betz 1981; Carter et al. 1997; Fletcher 1999; Neergaard and Eythórsdóttir 2008). This indicates that girls are conditioned in a different way and that women make choices based on different experiences to men. This is not to say that it is not possible to overcome RIGs, but it is necessary to find methods of “unconditioning”—of breaking the patterns. Hence, taking a critical case perspective, if ways of enhancing women’s self-efficacy can be identified, then we will also have found a way of increasing the level of men’s (Neergaard 2007). However, because these patterns of behavior are based on a subconscious conditioning, they *are* very difficult to change. Further, the deeper the RIGs are built in our culture, the more difficult it is to change them. Thus, the Jante Law can best be described as a universal, national RIG, see Box 19.1.

Box 19.1 Janteloven (The Jante Law) (based on Sandemose 1933)

Du skal ikke tro, du er noget ~ ~ ~ (You shall not think that you are special)

Du skal ikke tro, du er lige så klog som os ~ ~ ~ (You shall not think that you are of the same standing as us)

Du skal ikke tro, du er klogere end os ~ ~ ~ (You shall not think that you are smarter than us)

Du skal ikke indbilde dig, du er bedre end os ~ ~ ~ (You shall not fancy yourself as being better than us)

Du skal ikke tro, du ved mere end os ~ ~ ~ (You shall not think that you know more than us)

Du skal ikke tro, at du er mere end os ~ ~ ~ (You shall not think that you are more important than us)

Du skal ikke tro, at du duer til noget ~ ~ ~ (You shall not think that you are good at anything)

Du skal ikke le af os ~ ~ ~ (You shall not laugh at us)

Du skal ikke tro, at nogen bryder sig om dig ~ ~ ~ (You shall not think that anyone cares about you)

Du skal ikke tro, at du kan lære os noget ~ ~ ~ (You shall not think that you can teach us anything)

The impact of the Jante Law on Danish/Scandinavian culture is pervasive and Danes are, in general, very skeptical of success (Smith and Neergaard 2008). The Jante Law also partly explains the power of the social democratic values espousing equality, which are simultaneously an advantage and a problem. They represent an advantage, because they helped create the Nordic welfare model, which redistributes wealth from the rich to the poor, so that the difference between the two groups is reduced. They constitute a problem, because the incentive to better oneself—and therefore be smarter, special, or better in some way—is reduced. Thus, having a self-efficacious feeling may be affected by such universal beliefs.

Since patterns of behavior are built up over long periods of time, they cannot be broken just in one go. It is necessary to create a trustful teaching environment that provides continuous experiences of success. Thus, just one successful experience may not be sufficient to change an internalized experience. Further, it is necessary to identify differentiated challenges that are right for the individual and make sure that each individual has positive experiences—as a single negative experience will just bring home the original aversion against carrying out a certain act. Therefore, teaching needs to include ways of impressing on potential entrepreneurs that it may be the expectation and perception of how difficult it might be that is the worst part. It can be likened to jumping from the 10-m diving board—it is walking out toward the edge that is the worst part.

A high level of self-efficacy is achieved through repeated performance accomplishments and the overcoming of obstacles through effort and perseverance (Wood and Bandura 1989) and produces the belief in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to exercise control over events in one's life (Wood and Bandura 1989). So how can we teach self-efficacy? Bandura's (1997) self-efficacy framework operates with four sources of self-efficacy or ways in which we are subconsciously conditioned toward achievement: mastery experiences, vicarious experience (also known as modeling), social/verbal persuasion, and judgment about physiological and affective state. As will be shown, each of these operates in the individual–environment nexus. Wood and Bandura (1989) further distinguish between possessing skills and the ability to use them well and consistently under difficult or adverse circumstances. The question is then how and in which circumstances an individual learns to cultivate these skills and the ability to use them well. That is, complete mastery of a skill is no guarantee that the skill will be used, especially under stress or in the face of high stakes; no self-efficacy, no behavior. In order to identify how it is possible to support positive representations, replace or transform possible negative ones, to produce self-efficacious behavior, we can use Bandura's framework.

19.2.2 Mastery Experiences

Bandura describes how the gradual generation of an ability may result in a mastery experience. The experience has to be sufficiently difficult to achieve and contain a potential danger of failure. If this action succeeds then it will count as a mastery

experience. Thus, a task, which is too easy to achieve, will not provide a change in perception. In other words, we are concerned with tasks that will bring about a more competitive, risk taking, self-reliant, or ambitious attitude such as participating in competitive sports activities, hence generating self-efficacious attitude.

19.2.2.1 Vicarious Experience/Modeling

According to Bandura (1977b, 1986), vicarious experience means that we learn through imitating or repeating the behavior of others. Bandura suggests that most modeling is based on behavioral observation. It occurs when a certain social behavior, e.g., entrepreneurship, is informally observed and then adopted by an individual. Hence, the learning occurs by example rather than by direct experience (Bandura 1977b). In other words, role models are individuals on whom you can mirror your own behavior and use as a guide for your own action and are usually persons whom the individual admires and whose opinions are trustworthy. The good role model delivers the first stepping-stone or guide for action so it is perceived as less dangerous to navigate through uncertain and potentially challenging waters. Scherer et al. (1989) found that the presence of a high-performing parent entrepreneur had a positive impact on an individual's choice of an entrepreneurial career. However, role models do not necessarily have to be actual entrepreneurs or parents although they can be, but a role model always has to be relevant and believable for the situation in which the individual finds himself or herself in. Thus, women may mirror themselves in different role models than men.

19.2.2.2 Social/Verbal Persuasion

Bandura describes the influence that our environment has on our beliefs of what is acceptable or non-acceptable behavior through the discourse or peer pressure. For instance, the reason for the low participation of women in entrepreneurship in many countries may be due to the fact that entrepreneurship is often associated with long working hours, and particularly young women of childbearing age may deselect entrepreneurship because the environment does not allow for this double role. This goes hand in hand with ideas about social identity because it typically involves peers—family, other women's acceptance—or other groups who can be defined as culture bearers.

19.2.2.3 Judgment About Physiological State

In order to heighten beliefs in coping efficacy with corresponding improvements in performance it is important to eliminate emotional reactions to subjective threats through mastery experiences (Bandura 1989). He describes the importance of being conscious of physical and emotional reactions in different situations and how you perceive and interpret these reactions because this impinges on your ability. If you

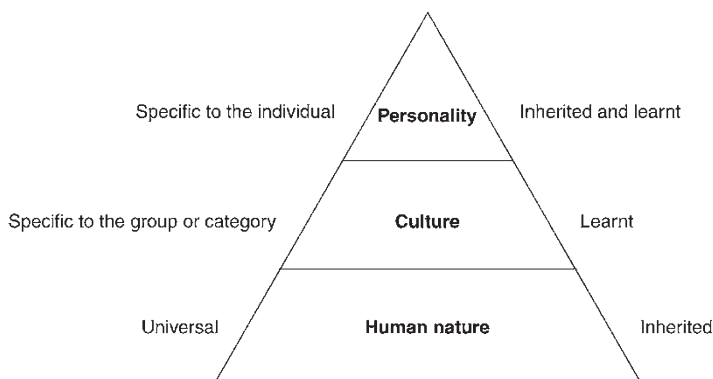


Fig. 19.1 The three levels of mental programming/conditioning (Hofstede 1991: 6)

are unable to register and interpret your own bodily reactions and emotions when you have reached your limit, then you will ultimately fail in what you are doing and therefore you will have an unsuccessful experience. This is why we see a high extent of very clever and highly motivated entrepreneurs who “burn out.” The relation between bodily reactions, emotions, and feelings of success is thus very close. There is some taboo surrounding the verbalization of emotions in teaching environments, which may make it very difficult to change this situation.

Therefore, in order to facilitate entrepreneurial behavior we need to promote certain behavioral patterns. The way to do this may potentially include a facilitating, coaching approach to making individuals think reflexively about their own RIGs or exposing them to exercises that slowly push their limits for certain behavior. For example, in teaching entrepreneurs who may fear rejection from the first customer, a teacher could ask “Are there situations in which you feel comfortable in contacting new persons?” And “Are there then potential ways in which you extrapolate from this situation to situations where you feel uncomfortable?” Such future-oriented and solution-driven questions do not break the therapeutic space but more subtly facilitate an emotionally safe solution that will condition the mind toward a more positive interpretation of oneself. Figure 19.1 shows the interrelationship between the four sources of self-efficacy and the process of transforming behavioral patterns. The idea is that for each of the sources it is possible to design a curriculum and appropriate teaching methods. This will naturally be different depending on the age and the stage of education, which will be shown in a later section.

19.2.3 Measuring Self-Efficacy in Psychology

There are various approaches to measuring self-efficacy. Generally they fall into three different groups (Gecas 1989): task-specific measures (Bandura’s own approach), domain-specific measures (e.g., health, political, entrepreneurial), and general

measures. What can be learnt from the existing studies in, e.g., the health literature is that self-efficacy is a significant factor in overcoming various disorders, addictions, and phobias. Indeed, recovery from different types of illness seems to be more rapid in individuals with high levels of self-efficacy (Schwalbe and Gecas 1988).

However, according to Gecas (1989) the measurement of self-efficacy in the psychology literature is still rather primitive. Even the general measures have predominantly been concerned with measuring levels of self-efficacy *ex ante* and *ex post* some participation in an experimental setting (see, e.g., Zimmerman et al. 1992 for an exemplar). A positive attitude or state of mind seems to work, but how it works is still a mystery (Gecas 1989). In other words, research that addresses the underlying determinants of self-efficacy is lacking in this body of research and this is important if attempts to improve levels of self-efficacy in individuals are to succeed (Gist and Mitchell 1992). Therefore, we need to identify the triggering factors of the type of behavior we want to improve, e.g., entrepreneurial behavior. However, how entrepreneurship research has addressed the measurement of self-efficacy will be discussed later.

19.3 ESE: Entrepreneurial Self-Efficacy

Two ambitions have driven the transfer of psychological constructs in general and more specifically that of self-efficacy into the entrepreneurship literature. First, there is our general ambition as entrepreneurship scholars to produce more entrepreneurs, as we strongly believe in their positive economic influence, a fulfilling lifestyle, and an attractive life option. Second, the field has failed for a long time to find personality traits in entrepreneurs that could differentiate them from other groups (see, e.g., Gartner 1988). The field has now turned to drill into the entrepreneur's head, searching for distinct entrepreneurial characteristics both specific enough to be descriptive of core entrepreneurial concepts and at the same time broad enough to embrace all varieties of entrepreneurs.

19.3.1 The History of Entrepreneurial Self-Efficacy Research

In order to delineate the growing impact of self-efficacy in entrepreneurship research, we propose to look back to 1989. Bandura (1977a) published his seminal work on self-efficacy in the context of human agency, and Gist (1987) introduced self-efficacy to the management literature with a discussion of implications for organizational behavior and human resource management. Then, Scherer et al. (1989) published a study on the role model performance effects on the development of entrepreneurial career preferences. These are among the pioneers in drawing on concepts from the field of psychology (namely Social Learning Theory), introducing them to the field of entrepreneurship, thereby starting a valuable interdisciplinary discussion. Their results revealed that the existence of a parent role model, cf.

Bandura's "modeling" concept, increases a variety of antecedents to the child's entrepreneurial career choice: entrepreneurial career expectancy (what is later labeled as intention, see, e.g., Bird 1988) and entrepreneurial preparedness including—what Scherer et al. (1989) call—education and training aspirations as well as entrepreneurial task self-efficacy (op. cit., p. 66).

For the next decade, entrepreneurship researchers developed the concept of entrepreneurial self-efficacy. It moved slowly from the psychological corner of career choice research—where it had also been overlooked as a viable career option (Boyd and Vozikis 1994, p. 74)—via intentions research into the center of the entrepreneurship field. While studies after 1998 mostly used the term entrepreneurial self-efficacy, there is a rather broad variety of terms used up to this point. Boyd and Vozikis (1994) are exemplary of a noteworthy development step: building upon the work of Scherer et al. (1989), thus tying their research to the career-related self-efficacy discussion. However, they finally end up labeling their own scale "entrepreneurial self-efficacy"—or ESE. The concept was then popularized in the entrepreneurship discussion by Krueger and Brazeal (1994), who defined it as an attribute of personal competence and control, which helps convert perceived failures into learning experiences. For them, there is no question about the importance of the concept: "No self-efficacy, no behavior" (op. cit., p. 94). Yet, Krueger and Brazeal used the terms "perceived venture feasibility" and "perceived venture self-efficacy" and built a scale by adapting a set of obstacles for corporate ventures from MacMillan et al. (1986).

The term entrepreneurial self-efficacy finally emerged as the combination of self-efficacy as a task-specific psychological concept and entrepreneurship as a bundle of tasks that are supposed to represent the entrepreneurial career choice. The concept gains a foothold when it started to manifest itself in the titles of top tier journal articles. Chen et al. (1998) were among the first to mention entrepreneurial self-efficacy in the title of a research paper, thereby moving the concept into the focus of the field. Their study tied directly in with the dissatisfaction of the field in searching for general entrepreneurial traits, trying to identify distinctively entrepreneurial characteristics. Chen et al. (1998) were able to show that entrepreneurial self-efficacy offered the potential to differentiate entrepreneurs from non-entrepreneurs. Thus, they carried out the task-specific adaptation of self-efficacy to the entrepreneurial domain, opening up a fruitful discussion on the relevant entrepreneurial facets that needed to be included in valid measurement scales for entrepreneurial self-efficacy. They also contributed to the debate in the literature by differentiating the concept from other psychological concepts as locus of control which had shown "only limited success in differentiating entrepreneurs from higher achievers and internalizers in other spheres of life" (op. cit., p. 312) and the importance of the contribution is cemented by the inclusion in Shane and Venkataraman's (2000) seminal article on entrepreneurship as a field of research. Shane and Venkataraman (op. cit., pp. 222–224) mentioned cognitive properties as an important field of study in context with the discovery of opportunities, pointing explicitly to the value of incorporating entrepreneurial self-efficacy in entrepreneurship research.

Since 1998, the number of articles on entrepreneurial self-efficacy has been constantly growing. Roughly until 2004, research mainly focused on either creating scales for entrepreneurial self-efficacy or testing existing scales in varying contexts (Kourilsky and Walstad 1998; DeNoble et al. 1999; Anna and Chandler 2000; Drnovsek and Glas 2002; Lucas and Cooper 2004; Forbes 2005; Hao et al. 2005). Originally stemming from career research, many of these studies examined the impact of entrepreneurial self-efficacy on entrepreneurial intentions. Especially in the context of training programs, entrepreneurial self-efficacy was employed to check the program's effectiveness (e.g., Peterman and Kennedy 2003; Lucas and Cooper 2004). A basic discussion point was the fact that self-efficacy emerged as an important mechanism to overcome perceptions of risk. Hence, the mechanism fitted well into the venturing process (e.g., Boyd and Vozikis 1994; Krueger and Brazeal 1994; Krueger et al. 2000), which also led to studies trying to explain gender differences in entrepreneurial activity (e.g., Kourilsky and Walstad 1998; Anna and Chandler 2000).

Since 2004, research has begun to take on a more nuanced approach, surrendering assumptions of direct relationships, discussing moderating and mediating effects, and inquiring more intensely about antecedents of entrepreneurial self-efficacy (e.g., Hao et al. 2005; Hmieleski and Baron 2008; Forbes 2005; Wilson et al. 2007; Hmieleski and Corbett 2008). For the years 2007 and 2008 alone, a total of 14 studies building on the existing body of entrepreneurial self-efficacy research were published. This is certainly an indicator of the growing interest in and impact of ESE and signifies the need for further research. Therefore, the next section will address those three issues that may be pertinent to the future development of the discussion on entrepreneurial self-efficacy.

19.3.2 Measurement of ESE

When comparing scales of entrepreneurial self-efficacy, the scales used by Scherer et al. (1989), Chandler and Jansen (1992) as well as Krueger and Brazeal (1994) offer interesting starting points. Building upon a scale by Betz and Hackett (1981), Scherer et al. (1989, p. 59) asked participants whether they believe in their capabilities of performing tasks such as accounting, production, marketing, human resources, and general organizational tasks. Obviously, these tasks belong to the field of management as a whole and are hardly idiosyncratic for the field of entrepreneurship research. The reason for this is that the discussion started in the field of career research where task-specific adaptations of the construct were carried out through definition of typical task sets for the particular career path (see also Lucas and Cooper 2004 for a more recent study within the career choice stream). Therefore, the entrepreneurial career path seems at first sufficiently described by general management functions, at least if compared to scales for entirely different career paths like teachers or parents. In a comparable approach and almost simultaneously, Chandler and Jansen (1992) developed an entrepreneurial competences scale, combining entrepreneurial, managerial, and technical-functional roles in order to cover the full

spectrum of entrepreneurial activity. Anna and Chandler (2000) followed up on this scale, inquiring for self-efficacy on competences like opportunity recognition, formal planning, economic management, and human/conceptual competence. Further, Krueger and Brazeal (1994) propose their perceived venture self-efficacy scale with 27 items on obstacles for ventures. This scale has been taken up again in recent studies in the *Journal of Developmental Entrepreneurship* (Sequeira et al. 2007; Mueller and Dato-On 2008).

Although the psychology literature also uses a general self-efficacy scale, entrepreneurship researchers have mostly adopted a task-specific understanding. Studies still using the general self-efficacy scales have been carried out by, e.g., Markman et al. (2002) and Markman and Baron (2003). In 1998, Chen et al. consolidated the existing research and built a scale combining the works of Scherer et al. (1989), Boyd and Vozikis (1994), and Krueger and Brazeal (1994), stressing the understanding of entrepreneurial self-efficacy as a key prerequisite for entrepreneurs and a key impact factor for entrepreneurial intentions. In order to create their scale, they further drew upon the literature on entrepreneurial roles (Long 1983; Kazanjian 1988; Miner 1990). Chen et al. (1998) argued that enlisting a full list of entrepreneurial activities would be highly impractical and alternatively chose exemplary activities, which they believed characterize this special “career choice” of entrepreneurship. In conclusion, they define entrepreneurial self-efficacy as the belief of an individual to be capable (efficacious) to successfully perform a set of typical entrepreneurial activities. Chen et al. (1998) finally produced a list of 26 items to represent the domain of entrepreneurship. Five factors turned out to underlie the item structure: marketing, innovation, management, risk taking, and financial control. Results showed the scale’s capacity to successfully differentiate founders from non-founders. In comparison to Scherer et al. (1989), it even revealed a development from rather managerial functions to a more entrepreneurial conceptualization. However, among the five factors, Chen et al. only found two to be uniquely entrepreneurial, namely innovation and risk taking. They concluded that the three managerial competences are necessary for entrepreneurs in a more general sense but do not differentiate them from other managers.

However, DeNoble et al. (1999) criticized the scales by Chandler and Jansen, as well as Chen et al., for not being sufficiently entrepreneurship specific. DeNoble et al. (1999) proceeded in a similar way to build a different scale. Eight entrepreneurs generated 100 statements, which were condensed to 35 skills and behaviors, which were further reduced by exploratory and confirmatory factor analysis to six dimensions: developing new product or market opportunities, building an innovative environment, initiating investor relationships, defining a core purpose, coping with unexpected challenges, and developing critical human resources. Results showed that this set of skills and behaviors influences entrepreneurial intentions (DeNoble et al. 1999). More recently, this scale has been identified as an alternative to the scale by Chen et al. for its robustness in predicting entrepreneurial performance (Hmieleski and Baron 2008; Hmieleski and Corbett 2008). Despite its questionable fit with the entrepreneurial domain, Chen et al.’s scale has become a cornerstone for entrepreneurial self-efficacy measurement in the literature and has since been used in a variety of

studies (e.g., Drnovsek and Glas 2002; Forbes 2005; Hao et al. 2005; Steffens et al. 2006; Urban 2006; Wilson et al. 2007). Hao et al. (2005) and Sardeshmukh and Corbett (2008) further advanced the scale and moved it even closer to the core of entrepreneurial activity: identifying new business opportunities, creating new products, thinking creatively, and commercializing an idea or new development.

19.3.3 Impact of ESE and Moderating Effects

As previously mentioned, the entrepreneurial self-efficacy literature has its infancy in career research. Accordingly, many of the early studies tried to explain differences in career choice. However, Krueger and Brazeal (1994) relate their measure of perceived venture self-efficacy to models of entrepreneurial intent. As entrepreneurial self-efficacy, the concept became popularized as an antecedent to entrepreneurial activity. Chen et al. (1998) found “a significant and consistent positive effect of entrepreneurial self-efficacy on the likelihood of being an entrepreneur” (op. cit., p. 310). While this relationship has been reproduced by other studies (DeNoble et al. 1999; Krueger et al. 2000), research on the direct impact on performance has produced less congruent results. Anna et al. (1999) and Forbes (2005) both reported a positive impact of entrepreneurial self-efficacy on subjective performance measures. However, Chandler and Jansen (1997) found no such performance impact for entrepreneurial self-efficacy in their attempt to predict causal relationships between entrepreneurial competences (entrepreneurial, managerial, and technical self-efficacies) and emerging venture performance. Managerial efficacy turned out to be a significant predictor of subsequent performance, while the entrepreneurial and technical dimensions did not predict performance. Neither could Chen et al. (1998) provide a link. They offered a set of possible explanations for the unexpected results. First, self-efficacy in general is used to predict performance at the individual level. They believed the relationship with venture performance to be more complex. Second, they noted that self-efficacy has been a good predictor for performance that followed closely in time and not so much for more distant performance effects. Third, “although higher self-efficacy definitely motivates entrepreneurial entry, it may not always positively affect performance” (op. cit., p. 313). This links directly to the results of more recent studies, e.g., Hmieleski and Baron (2008) cite references from the psychology and management literature that have found positive relationship between self-efficacy and growth (e.g., Baum et al. 2001; Baum and Locke 2004). However, it is necessary to note that these studies have used adapted self-efficacy scales in which they do not ask for entrepreneurial functions but for the *ability* to grow a business. The authors conclude their own literature review stating that entrepreneurs high in self-efficacy seem to be “higher performing in that the firms they lead tend to grow more quickly and be more profitable than those led by entrepreneurs who are comparably lower in entrepreneurial self-efficacy” (Hmieleski and Baron 2008, p. 60). However, their own results question a direct impact and show moderating effects on the performance impact of entrepreneurial self-efficacy.

In terms of moderating effects, Chen et al. (1998) include the environment in their theoretical discussion as one part of a triangle of reciprocal causation of (i) cognition, (ii) behavior, and (iii) environment, which all seem to influence the relationship between self-efficacy and performance. In conclusion, they advocate a consideration of the environment, shaping it so that it is supportive to entrepreneurs. They claim that individuals feel to be more self-efficacious when they can assess their own entrepreneurial capacity within a supportive environment (op. cit., p. 314). Other studies have also suggested further moderating effects: Sequeira et al. (2007) found that the structure of the entrepreneur's personal network moderates the relationship between self-efficacy and entrepreneurial intentions as well as action. Hmieleski and Baron (2008) are able to predict entrepreneurial performance but find the relationship to be moderated by dispositional optimism and environmental dynamism. Hence, entrepreneurial self-efficacy and high levels of optimism can coalesce to inadequate levels of over-confidence with negative effects in a dynamic environment. Therefore, entrepreneurship education programs should be required to teach tools of self-regulation (Hmieleski and Baron 2008). In another recent study, Hmieleski and Corbett (2008) examine the relationship of improvisational behavior on new venture performance and entrepreneurs' job satisfaction. In this study, they find entrepreneurial self-efficacy to moderate the relationships. While the improvisation–performance relationship is positively moderated, the improvisation–satisfaction relationship is negatively moderated, which opens up further avenues of research on interaction effects (Hmieleski and Corbett 2008).

Finally, some studies have analyzed mediating roles of self-efficacy: Luthans and Ibrayeva (2006) find a direct and mediating effect of self-efficacy on performance in the context of transition economies. Hao et al. (2005) were among the first to look back into the chain of causalities to the antecedents of entrepreneurial self-efficacy, discussing the mediating role of self-efficacy on intentions. The latter shows that entrepreneurial self-efficacy mediates the impact of perceptions of formal learning, entrepreneurial experience, and risk propensity on entrepreneurial intentions.

19.3.4 Antecedents of ESE

A discussion on antecedents to entrepreneurial self-efficacy brings us back to the field of psychology with its emphasis on mastery experience, modeling/vicarious experience, social persuasion, and physiological factors as antecedents to entrepreneurial self-efficacy. By now, a variety of studies have started to look more intensely into these antecedent concepts to entrepreneurial self-efficacy (Scherer et al. 1989; Forbes 2005; Hao et al. 2005; Barbosa et al. 2007; Carr and Sequeira 2007; Wilson et al. 2007; Mueller and Dato-On 2008; Sardeshmukh and Corbett 2008). Scherer et al. (1989) emphasized the necessity of a *parent role model* and its impact on entrepreneurial self-efficacy. They saw a need to develop theory in terms of the underlying mechanisms, in their case how an entrepreneurial role model influences career preferences (op. cit., p. 67). Hao et al. (2005) found that *training programs, previous experience, and risk*

propensity—three of the most frequently identified individual-level antecedents of entrepreneurship—drive entrepreneurial self-efficacy and subsequent intentions to become an entrepreneur. They advised to “incorporate as many diverse types of learning experiences related to the promotion of greater entrepreneurial self-efficacy as is practical” (op. cit., p. 1270). Forbes (2005) discussed the impact of *strategic decision making* on entrepreneurial self-efficacy, showing that the type of decision making in a venture influences self-efficacy beliefs. He also hypothesized that there has not been a lot of antecedent research due to the fact that effect relationships of entrepreneurial self-efficacy are more straightforward (op. cit., p. 616). Carr and Sequeira (2007) discussed the importance of the *family influence* on entrepreneurial self-efficacy. Wilson et al. (2007) found a strong influence of *entrepreneurship education* on entrepreneurial self-efficacy. The results from their gender study with female participants of different age groups suggest that it is important to provide entrepreneurial training at an early age (Wilson et al. 2007). Krueger and Brazeal (1994, p. 94) summarized the importance of antecedent research as follows: “We learn self-efficacy from actual mastery of the behavior and from believable models of the behavior. It is enhanced by believable information about the behavior and emotional support for performing the behavior (Bandura 1986). These antecedents prove important to promoting the perceived feasibility of new ventures.”

Thus, what is not found in the literature is a stringent breakdown of the antecedent discussion in connection with “diagnosis and treatment” of entrepreneurial self-efficacy. Given the current state of research, we propose to focus on two aspects in future research:

1. What can we do in the process of early-age formation to foster entrepreneurial self-efficacy?
2. How is it possible to influence children, adolescents, or young adults with low levels of entrepreneurial self-efficacy to develop the respective cognitive resources?

Chen et al. (1998) provided a variety of suggestions. For example, they proposed entrepreneurship programs to focus not only on entrepreneurial skills but also on entrepreneurial self-efficacy. They put experience first, be it in meeting role models or in working on their own projects or together with other entrepreneurs. They saw treatment in practical training to enhance innovation and risk taking, their two significant dimensions of entrepreneurial self-efficacy. Accordingly, all other antecedents of self-efficacy may be analyzed in terms of applicable tools for entrepreneurship education and training and how this can tie in with the design of a favorable learning environment.

Thus, while research on entrepreneurial self-efficacy has produced valuable knowledge on the measurement of the concept as well as its effects, there seems to be a pertinent need for research on its antecedents and even on the underlying factors or mechanisms that influence the antecedents. Entrepreneurial self-efficacy, the type of subconscious “social persuasion” that arises through individual’s interaction with the environment (Bandura 1977b), which embeds itself deep within us without our conscious knowing, needs to be brought out in the open if we are to address it in practice.

19.4 Entrepreneurial Self-Efficacy Contextualized

So far we have seen that self-efficacy is a rather complex psychological concept that dropped into entrepreneurship via career choice research. The question by Krueger and Brazeal, “*What specific factors lead to the perception of self-efficacy for potential entrepreneurs in a community?*” goes right to the crux of the matter (Krueger and Brazeal 1994, p. 99). They continue, “Unanswered is the question of how to encourage entrepreneurship in a discouraged population. Can we use the model to identify tactics to overcome learned helplessness?” and remind us “Entrepreneurs are made, not born.” (Krueger and Brazeal 1994, pp. 101, 102). Few have attempted to answer these questions empirically and the origin and underlying components of self-efficacy still need to be investigated.

Therefore, we may need to center the discussion on which particular mechanisms produce these characteristic attitudes and beliefs and possibly internalized to the extent that they can be perceived and appear as “inherent.” Many successful entrepreneurs have little further education and even less entrepreneurship education. Instead, they have a kind of drive that sets them apart and although many have no leadership training at all, they tend to lead their companies with vision and spirit and success. So if entrepreneurial behavior is not taught, from whence does it arise? Although traits may not be inherent at first, they may become internalized as a result of a socializing or educational experience and in time become what we perceive as “inherent” personality traits. According to social psychologists, such acquisition takes place through various forms of experiential learning at some point in life and often in what is popularly called the formative years. Indeed, according to Carland et al. (1988) based on Myers and Myers (1980), personality is something that is largely set during the formative years, that is, attitudes and beliefs are learned. The crucial question is where in the social arenas of their lives do entrepreneurs learn the building blocks of entrepreneurial thinking? One way of exploring this question is by looking to anthropology. Hofstede (1991) suggested that human nature is universal and inherited and cannot be changed. However, what is generally referred to as culture and personality can be programmed or conditioned into the minds of individuals, cf. Fig. 19.1.

Most entrepreneurship scholars agree that the notion of a fixed “entrepreneurial personality” is unlikely at best, but equally that entrepreneurs do think differently (Shaver and Scott 1991). At the same time, both scholars and practitioners appear to assume that much of these differences must arise from various processes of socialization that might explain, even predict, the base rate characteristics of aspiring entrepreneurs (Starr and Fondas 1992). Indeed, Mitchell et al. (2002) demonstrated that cultural differences explain some of the variance in venture-creation decisions among countries. Thus, they seem to agree with Hofstede (1991) who further suggested that cultural programming may take place at different levels in the environment and that a culture consists of both values and practices. National values are more universal—hence, if a nation does not espouse entrepreneurial values generally then this will affect how families bring up their children, see Fig. 19.2. In other words, The Jante Law can be perceived as a national value that inhibits entrepreneurial

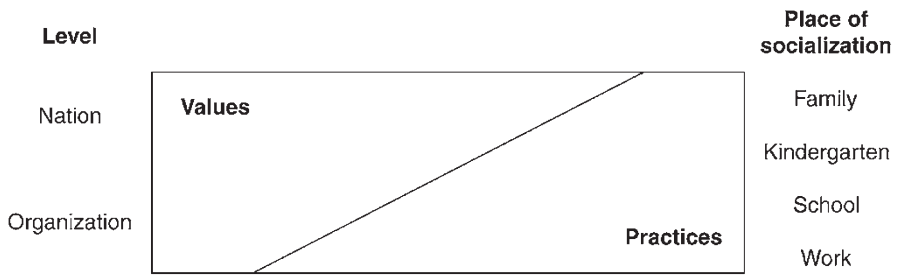


Fig. 19.2 Places of cultural programming (Hofstede 1991: 182)

behavior causing reactions such as the “Tall Poppy Syndrome.” Naturally, the family also has an influence on the values transmitted to its children, but if these are very different from the universal ones, then it becomes much more difficult for the child to act in ways that are expected by the social environment. It will thus be much easier for a child brought up in a culture permeated with entrepreneurial values to choose a career as an entrepreneur. Entrepreneurship research has also suggested that growing up in a family business can do much to mold one’s entrepreneurial thinking (Krueger 1993). These experiences provide the children with very early understandings of what they can do in life, how they can influence their own lives, what options are open to them, and how the environment is going to react. This section will continue to provide exemplars of how infants, young children, adolescents, and young adults may be conditioned toward a self-efficacious behavior and an entrepreneurial career in the different “social arenas” of their lives.

Bandura (1997) discusses two different ways in which children are conditioned toward self-efficacious behavior, a positive and a negative. The former is produced through support, encouragement, and positive modeling. For example, children who are given challenging or “risky” tasks at an early age, encouraged to undertake these tasks, and praised for the results will experience higher levels of self-efficacy as exemplified earlier in this chapter. The latter results from experience with learning to overcome adverse conditions or experiences. Bandura’s (1977a, b, 1986, 1994, 1997) examples are generally concerned with much more adverse conditions such as parental drug abuse, but for the purposes of this chapter, examples that relate to the generation of entrepreneurial behavior will be sought out. Table 19.1 provides an overview of examples of potential influential factors on self-efficacy at the various stages of children’s development. Chell (2008) similarly operates with a concept called concept cognitive-affective units. These are among others concerned with expectancies and beliefs that arise from experience of the social world influence of how an individual behaves depending on what she/he believes might happen in a particular situation (op. cit., p. 149). Furthermore, individuals choose desirable courses of action whose potential outcomes will hold particular values for them and avoid the undesirable. Again, these patterns of action and reaction are conditioned into individuals over time as they encounter new challenges to be overcome. Chell (2008) proposes that this generates an “if . . . then situation-behavior profile” and that an individual’s reaction to a challenge is therefore not random (op. cit., p. 150). Table 19.1 attempts to

Table 19.1 Bandura’s framework contextualized

	Mastery experience	Vicarious experience/ modeling	Social/verbal persuasion (discourse)	Judgements about physiological state
Infancy and early childhood (home, kindergarten and preschool)	<ul style="list-style-type: none"> Choice of toys and activities 	Reference groups: parents	<ul style="list-style-type: none"> Fairy tales Children’s TV Kindergarten teachers 	<ul style="list-style-type: none"> Physical exercises and activities
Adolescence (school, high school)	<ul style="list-style-type: none"> Participation in sports at a high level 	Reference groups: parents, peers	<ul style="list-style-type: none"> Media Teachers: Ways of teaching and rewarding appropriate behaviour 	<ul style="list-style-type: none"> Physical exercises and activities: participating in sports
Young adulthood (university)	<ul style="list-style-type: none"> Participation in sports at a high level 	Reference groups: family, peers, successful entrepreneurs (real life cases)	<ul style="list-style-type: none"> Teachers 	<ul style="list-style-type: none"> Participation in sports at a high level
	<ul style="list-style-type: none"> Teachers 		<ul style="list-style-type: none"> Media 	<ul style="list-style-type: none"> Preparing and attending exams
			<ul style="list-style-type: none"> Peers 	
			<ul style="list-style-type: none"> Coaches and mentors 	

exemplify what type of mechanisms may influence an individual’s “if-then” reaction pattern. Some of the influential mechanisms naturally transcend the whole period from infancy to adulthood. However, the content of the mechanism may change.

Clearly, the family is the most important socialization environment (Gecas 1989). The conditioning of the mind commences already in infancy when parents provide support, encouragement, and instill expectations in their children so that children come to perceive themselves as competent. Thus, parents who provide a stimulating, challenging, and responsive environment and give their children the freedom to engage in it produce more efficacious children. Children may also learn to develop coping strategies by modeling their parents (Bandura 1997).

19.4.1 *Infancy and Early Childhood*

Although parents will influence all the stages of development, this is probably the stage at which parents may have the most influence, because they make the most choices on behalf of their children. Thus, even in infancy and early childhood, parents may unwittingly condition their children in ways that do or do not support

entrepreneurial behavior at a later age. For example, old-fashioned nursery stories and fairy tales are often inundated with negative messages surrounding the ability to rise above one's station in life. The majority of Hans Christian Anderson's fairy tales present negative outcomes for those individuals who had the audacity to wish for a better future. The most loved fairy tale, and one which signifies the essence of Danish culture, is that of the little mermaid, who gave up her ability to speak to become human. She ends up as froth on the waves in the wake of the Prince's wedding because she could not convince him to love her. The little Matchgirl, a truly entrepreneurial child, selling matchsticks on the streets (that nobody will buy), dies in the cold of winter wishing for a better future. Further, many fairy tales portray the woman (princess) as a person who should just sit back, inactive, and wait for the young, handsome prince to rescue her. Neither produces associations that provide for much entrepreneurial thought. Entrepreneurial is the Prince who thinks up various ways of coming to her rescue or finding ways to overcome the obstacles on his way. Thus, choosing the right literature is the first step not only in infancy but also later on and books that stress young children's ability to influence their own everyday life may provide them with a different interpretation of their opportunities.

Children's hour on TV may be another example of a major influencing factor. Today, many parents use the TV as a babysitter, rather than involving the children in whatever activities they are undertaking themselves unlike in former times when children learnt how to master various activities from their parents. Further, the learning that the child takes away from watching TV depends on what program is chosen. Crucial to this discussion is thus how the content of TV programs may condition children to perceive themselves and their interaction with the environment. According to Danesi (2002), TV influences the way individuals derive meaning for their daily life routines. Open, friendly, and welcoming programs that stress friendship and sharing such as is portrayed by Teletubbies (UK), Teddy and Chicken (DK) or aggressive and hostile, survival of the fittest/smartest as portrayed by many of the cartoons on, e.g., Cartoon Network, will eventually if watched sufficiently frequently have a certain impact, positive or negative.

Parents may further inadvertently influence their children's level of entrepreneurial self-efficacy through their choice of toys. Indeed, construction toys provide children of both sexes opportunities for the development of an inquisitive mind. Toys may also function as role models—e.g., recently Peter Pan's Tinkle Bell doll and its associated products have provided girls with a new type of role model, who is opinionated, resourceful, and skilled.

Female role models dominate kindergartens and primary schools in most of the Western world and mostly the environments surrounding these locations are devoid of potentially dangerous element such as tall trees for building tree houses and climbing. Thus, activities are likely to be influenced by the dominant gender and include fewer choices that may involve risky behavior. Children are rarely allowed to make their own toys or reinterpret natural elements as something else, simply because the opportunity to do so is removed. Most playgrounds are fitted with pre-molded fixtures, which represent no danger to children. Therefore, the thrill of doing something that might be a little bit risky has to be found elsewhere.

Today, parental fear of potential harm coming to their children, which is often exacerbated by the media, also hampers children's freedom to experience and experiment with life as well as their urge and ability to decide for themselves. Children are driven to and picked up from school. Given the freedom to walk or bike, they learn to take care of themselves and make their own decisions, which is a good basis for future self-reliance. Over-controlling parents may easily have an effect on their children that counteracts entrepreneurial behavior.

19.4.2 Adolescence

For adolescents values and standards of conduct that are consistent with those of the home have usually been adopted—and the choice of friends tends to reflect a similar value system and behavioral norm and these peers are more likely to uphold their behavioral standards rather than to breed family conflicts (Bandura 1997, p. 177), but even adolescents who have been subjected to fractured families, poverty, or abuse (substance and physical) can result in one of two outcomes. These children may become as delinquent as their environment or they can learn to navigate successfully in these troubled waters and overcome the problems resulting in a high level of self-efficacy, and breaking the mold of social heritage. Thus, adolescents may be able to expand and strengthen their sense of efficacy by learning how to deal successfully with potentially troublesome situations in which they are unpracticed. Success in managing problem situations instills a strong belief in one's capabilities that provides staying power in the face of other, unrelated difficulties—e.g., a child who is mobbed in school, called names, or excluded from peer group activities may develop coping strategies that are centered on being “better” than those who undertake the mobbing or exclusion and not needing anyone else to succeed.

The approach to teaching seems to have an impact right from primary grade. Teachers who use a responsive classroom approach and provide rich classroom experiences have a greater chance of successfully influencing self-efficacy (Rimm-Kaufman and Sawyer 2004). Thus, the American model of awarding good and desirable behavior by handing out gold stars or other types of rewards assist youngsters in building self-efficacy. It is a subtle way of social persuasion to achieve the behavior wanted.

After-school activities such as participating in competitive sports may also help build self-efficacious behavior. Potentially, there are a number of such activities that may cultivate self-efficacy in one way or another by supporting the ability to overcome constraints, learn the ropes of the game, and endure and cope with difficulties. For example, competitive sports cultivate the aptitude to constantly better yourself, to endure hardship, and make judgments about how much pressure you can cope with. It helps improve perceptions and interpretations of environmental uncertainty and provide coping strategies in the entrepreneurial competitive arena, which is a crucial element in self-efficacy (Neergaard and Krueger 2005). Hence, children who participate in competitive sports are socialized into an entrepreneurial mindset—they feel

more competitively competent. They may feel spurred on by apparent obstacles rather than feel discouraged by them. Neergaard and Krueger (2005) found that entrepreneurs who were athletic high-achievers in adolescence and as young adults used their knowledge from their previous sports activities such as focus and persistence to develop appropriate business practices.

19.4.3 Young Adulthood

The media influences the self-schemata of efficacy dependent on physical appearance (strength or beauty) and produces sensitivity to social evaluation (Bandura op. cit., p. 178). Young adults watching programs such as “Top Model” will evaluate themselves against the apparent criteria set up by the program: skinny and beautiful. Hence, it is likely that documentary programs, which showcase entrepreneurs, will have a potential to “teach appropriate lessons” about entrepreneurship (Neergaard and Smith 2004) because young adults utilize media representations to evaluate their own lives and emulate various components of its content, such as lifestyle (Danesi 2002). Thus, if young adults see that society values individuals who are able to start a company and make a solid profit which gives access to a certain lifestyle, then they may attempt to copy that behavior. Thus, competitive programs such as “The Apprentice” may have similar impact on young would-be entrepreneurs as “Top Model” has on young girls. They want to be the chosen one, the one who has what it takes, and in order to obtain that they have to decode what underlying mechanisms may produce the “right” behavior. A study undertaken by Thompson and Dass (2000) suggests that experiential learning through simulations rather than lectures and cases increases student self-efficacy and strategic planning/thinking ability. The Apprentice is a real-life experiment: a simulation and may thus be copied successfully in class, if teachers understand how to avoid giving the students negative experiences rather than positive ones. Thus, it would be undermining the objective to provide derogatory comments, such as those typically given by the judging panels of the above-mentioned programs.

Another method that might be useful for teaching young entrepreneurship is coaching, as Malone (2001) found that coaching enhances self-efficacy. Such a measure may be used in classes where students are supposed to start their own company. They can be assigned a teacher who acts as a coach cum supervisor with whom to discuss their progress and the challenges they meet. This method assists them in finding their own solutions and thus finding ways to overcoming problems that they can use the next time they encounter a similar type of problem. In other words, they learn to master the skill of entrepreneuring.

This account of potential sources or mechanisms of self-efficacy is by no means claimed to be exhaustive. Some of the mechanisms highlighted above are general in nature, others specific. General mechanisms are those that take place in another context than entrepreneurship, but the learning gained can be extrapolated to an entrepreneurial setting, such as athletic experiences. These may not necessarily produce specific behavior in specific situations, but in conjunction with more specific mecha-

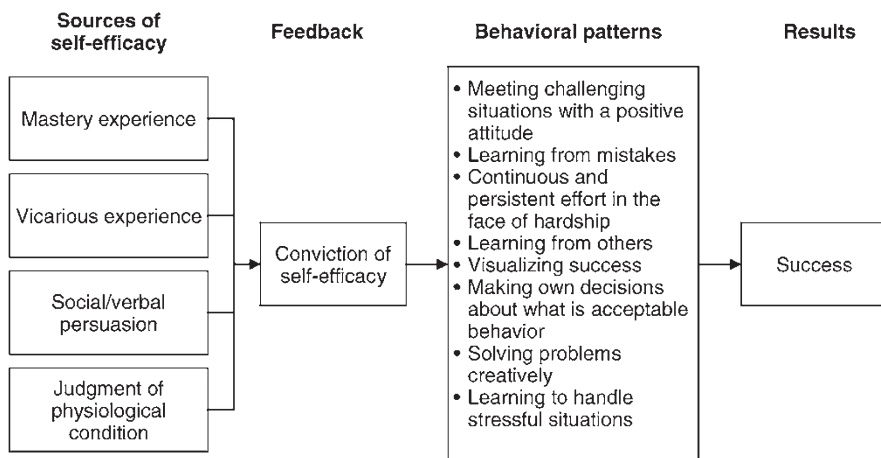


Fig. 19.3 A general model for successful training of self-efficacy (based on Bandura 1997)

nisms may be sufficient to tip the scales. Specific mechanisms are those particularly entrepreneurial, such as having parents or family who are entrepreneurs. It is probably easier to identify and measure the impact of specific mechanisms than that of the general mechanisms. Further, some of mechanisms transcend the various spheres of life: parents who are entrepreneurs do not stop influencing a child as it grows up; however, the child's interpretation of an entrepreneurial life may develop and change depending on how its mind is conditioned along the way. Figure 19.3 further provides an overview of some of the behavioral patterns that may be possible to reproduce in the classroom in order to (re)condition the student mind toward entrepreneurial action.

19.5 Future Perspectives and Concluding Remarks

Psychologists such as Bandura have long argued that there is an interaction between contextual factors and self-efficacy. Self-efficacy can thus only be produced if the contextual constraints allow this expression. Nevertheless, there has been a void in research and theory development on the relevant context conditions in entrepreneurship research. This chapter has hopefully helped kick off this discussion. Clearly, what is presented constitute only a few ideas. Better theoretical conceptualizations of the contextual/environmental variables that interact to produce self-efficacy are needed. Further, such research might help us establish why differences in entrepreneurial start-ups exist across nations. If underlying national cultural conditions have an impact, a change process may take a long time before it has an impact. In the matter of Denmark with its egalitarian ethos, which permeated school policies in the 1970s and 1980s, it might be difficult to replace traditional teaching methods with teaching methods that acknowledge that children are different, have different skills and interests, and should be taught accordingly.

Additionally, it might be helpful to gather evidence about successful entrepreneurship teaching methods in order to explore if and how these can be related to Bandura's self-efficacy framework, and which methods are most successful in reconditioning children and youngsters toward a more entrepreneurial mindset. Studies can be undertaken in two ways: either retrospective or longitudinal studies. Retrospective studies can trace the exposure of existing entrepreneurs to each of the four factors in Bandura's framework, as attempted by Neergaard and Krueger (2005) who explored the entrepreneurial skills generated through participation in competitive sports activities. Longitudinal studies could experiment with groups of young children and follow their development over time. Such an experiment is currently being undertaken by Danfoss Universe Research Lab in Denmark.

Finally, it should probably be noted that it is not possible to instill immediate changes in individuals. Even if students become aware of their RIGs, it will take continuous, positive conditioning to alter old emotions and patterns of behavior. A conditioning or reconditioning of the mind takes time so if we want future generations to be more entrepreneurial, now may be the time to start figuring out how to influence their paths.

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Chapter 20

Self-Efficacy and the Entrepreneurial Mindset Revisited

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20.1 Introduction

In 2009, entrepreneurial self-efficacy (ESE) had already experienced a significant build-up in interest for some years. Since then this interest has been continuously growing. This can, to some extent be explained by the increased attention that has been given to entrepreneurship in general, but especially by the increasing focus on entrepreneurial education (EE). In the following, we are revisiting the chapter “Self-Efficacy – Conditioning the Entrepreneurial Mindset” and continue the discussion that the original chapter ended with, namely how we can foster ESE through EE. In particular, we zoom in on how we can assist the formation of an entrepreneurial mindset at the university level (unfolding the young adulthood level to a greater extent). We thereby focus on those individuals who have not yet developed significant levels of ESE in their formative years. We assume that specifically for those individuals EE plays an important role in developing entrepreneurial attitudes, abilities and skills, and hence in enhancing ESE (Neck and Greene 2011). In other areas, researchers are already starting to connect self-efficacy with empowerment, and we explore the potential connections between empowerment and ESE. Concrete examples of how educational interventions can be designed to empower students and increase their ESE will be provided, but we also discuss the issues connected with the increased

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focus on ESE when designing teaching formats. We will, however, begin by discussing why measuring ESE has become so prevalent as well as presenting and evaluating how the field has developed during the past years to relate to the original chapter's discussion about the development of ESE scales and how these have been applied.

20.2 The Growing Interest of Measuring ESE in Entrepreneurship Education

To a large extent, the popularity of EE stems from the increased focus on new venture creation as a means to create innovation and growth (Landström et al. 2012). However, the diffusion of the topic to all levels and lines of education in many countries is better explained by the fact that it has become increasingly recognized that entrepreneurial skills and abilities are important to all citizens regardless of context. This is due to the fact that today's society has progressively become characterized by constant change and uncertainty (Gibb 2002). The increased focus on EE has broadened the topic's scope significantly bringing about a large variety of educational designs addressing different educational levels, contexts and disciplines. These educational initiatives do not have any direct focus on new venture creation, but rather centre on the fostering of entrepreneurial skills and abilities as the central learning goal.

These types of educational initiatives thus need to be evaluated and assessed with a focus on the skills and abilities that are fostered, rather than on the number of successful new ventures that the institutions generate (Blenker et al. 2011; Hannon 2005). Furthermore, it is difficult to use the number of students who become self-employed as an outcome measure, due to the significant discrepancy between the age at which individuals typically finish their education and the age at which they generally transfer to a career as self-employed (Delmar and Davidsson 2000). Skills, abilities and competences, on the other hand, are better aligned with the broad learning goals of educational institutions, and this focus makes it possible to assess short-term outcomes. When it comes to entrepreneurial skills and abilities it is, however, challenging for educational institutions to assess these with traditional methods, such as standardized tests. One reason is that many of those skills and abilities that are provided by EE are of a 'non-cognitive'¹ character (Moberg 2014; Rosendahl-Huber et al. 2014).

The focus on ESE solves many of these assessment problems. Since the focus is on evaluating how students develop their confidence in performing entrepreneurial activities, it fulfils educators' need to evaluate the development of a broad skillset. Furthermore, as the focus is on the individuals' confidence in their ability rather than their actual skill level, it is possible to measure this with self-reported data,

¹Non-cognitive skills can in this sense be understood as the residual of cognitive skills (usually measured with IQ tests). They are often defined as character and social skills such as attentiveness, perseverance, impulse control, sociability, motivation, self-esteem, self-control and forward-thinking behaviour (Cunha and Heckman 2010).

which circumvents the problems of assessing skills and abilities of a non-cognitive character. This focus on confidence in performing mainly non-cognitive skills has had a positive impact on education in the field, since many dimensions that have been given a trait-like character, such as the ambiguity tolerance, may instead be translated into a skill, which can be taught and assessed, such as ability to manage ambiguity. Additionally, due to its focus on assessing the respondents' confidence level, the ESE measure does not suffer from referential bias in the same way as other commonly used measures of non-cognitive skills do (see West et al. 2015). Furthermore, the link between ESE and consecutive entrepreneurial activities fulfils the demands of those who have a narrow focus on new venture creation as the most important outcome of EE. The use of ESE in evaluation studies thus offers many advantages. There are, however, still many problems with how ESE has been measured and used. This will be discussed in the next section.

20.3 Updates to the Literature Review

As previously stated, the interest in ESE remains high. The heterogeneous character of entrepreneurship as a research field and the large variety of learning goals of the different types of educational programmes and courses has further spurred the development of a large variety of different ESE scales. To shed light on this development, we performed a literature review for the years 2009–2015.² This review gave us a clear indication that research in the field has diverged rather than converged over the past years. Even if the most commonly used scales are still those developed by DeNoble and colleagues (1999) (used in 11 studies), and by Chen and colleagues (1998) (used in 6 studies), in the 37 articles included in our final literature review, a total of 20 different ESE scales were applied. Please see Table 20.1 for further details.

The dominance of these two scales can to some degree be viewed as a promising indication that there are some converging trends within the research on the topic. However, the dimensionality of these scales has not been fully replicated in consecutive studies. This implies that one of ESE's most important features, the possibility to assess the respondents' confidence in a broad scope of entrepreneurial

² We performed a systematic Boolean keyword search of the Business Source Complete (BSC) database using the search strings *entrepreneurial self-efficacy*, *ESE* and *entrepreneurial intention* in the title, abstract and author-supplied keywords, which generated 120 articles. In order to ensure that all relevant publications were included, a search for articles included in the meta-analyses by Bae et al. (2014) and Schlaegel and Koenig (2014) was performed. This generated an additional 57 articles. Furthermore, we scanned the citations available in BSC of the highly cited article by McGee et al. (2009), which generated another 33. A title and abstract scanning of the collected articles was performed, followed by a full text scanning examining if the articles are empirical studies on ESE and/or entrepreneurial intentions. This decreased the number of articles to 37. Each article was explored and information on the studies (including purpose of study, sample description, study design and scales used) and their key findings were extracted into a table.

Table 20.1 Studies included in the literature review on entrepreneurial self-efficacy 2009–2015

Authors	Scale	Key findings
Ali (2013)		ESE, the fear of failure, desirability of entrepreneurial career, entrepreneurs' status in society and education are significant predictors of EI. Completion of entrepreneurship course has a significant and positive effect on EI.
Bagheri and Pihie (2014)	Scherer et al. (1989)	ESE has a significant and positive effect on students' EI. The ESE—EI relationship is stronger in males compared to females.
Barakat and McJellan (2010)	Lucas and Cooper (2004)	Attending an entrepreneurship course significantly increases the students' ESE. Females show lower ESE than males on some dimensions.
Barakat et al. (2014)	Barakat et al. (2014)	Individuals with own venture have higher ESE compared to students. ESE of venture owners continuously increases, while students' ESE increases only during the course, and then levels out.
BarNir et al. (2011)	Chen et al. (1998)	The presence of a role model increases an individual's ESE, which in turn increases EI. Role models affect women's ESE more than they affect men's ESE, and ESE appears to mediate the effect of role modelling on EI more strongly from women than for men
Borchers and Park (2010)	Chen et al. (1998)	Attending an entrepreneurship course increases a student's ESE. There is significant and positive correlation between ESE and entrepreneurial intention. 'Locus of control' serves a moderating role in the relationship between ESE and entrepreneurial intention.
Bullough and Renko (2013)	Zhao et al. (2005)	Business leaders' and entrepreneurs' ESE and resilience are particularly important in times of uncertainty and challenging circumstances.
Byabashaija and Katono (2011)	Schwarzer (1993)	Entrepreneurship education significantly impacts students' ESE, and students' ESE has significant influence on their EI.
Coleman and Kariv (2013)	DeNoble et al. (1999)	Higher ESE is associated with being more successful (securing capital, overall performance). Higher ESE and the availability of financial capital enhance performance expectations. ESE seems more important for women entrepreneurs in overcoming barriers for securing financial capital and growing their firms.
Co and Cooper (2013)	Lucas and Cooper (2004)	Participation in an entrepreneurship course significantly and positively influences the students' ESE.
Díaz-García et al. (2015)	Chen et al. (1998), DeNoble et al. (1999), and Anna et al. (1999)	Participation in an entrepreneurship course increases students' ESE, and the level of ESE remains stable after course completion.

(continued)

Table 20.1 (continued)

Authors	Scale	Key findings
Douglas and Fitsimmons (2012)	Chen et al. (1998)	Students with EI have higher levels of ESE compared to students with intrapreneurial intentions.
Engle et al. (2010)	DeNoble et al. (1999)	Ajzen's 'Theory of Planned Behaviour' successfully predicts EI. ESE is a significant predictor of EI in Bangladesh, Egypt, Finland, France, Germany, Russia, Spain.
Hallak et al. (2012)	DeNoble et al. (1999)	Business owners' ESE has a significant and positive effect on enterprise performance, regardless of whether or not the business is family owned.
Izquierdo and Buelens (2011)	DeNoble et al. (1999)	ESE and attitudes are important predictors of EI. 'Attitude toward entrepreneurial acts' mediate the relationship between ESE and EI.
Karhunen and Ledyaeva (2010)	Liñán and Chen (2007)	Students with high ESE show high entrepreneurial interest. Students with low ESE show low levels of risk tolerance.
Khedhaouria et al. (2015)	Schwarzer et al. (1997)	Self-efficacy and EO are positively and directly associated with firm performance, and EO mediates the relationship between creativity and firm performance.
Kickul et al. (2009)	Cox et al. (2002)	Analytical and intuitive individuals present similar levels of entrepreneurial intentions, but use different cognitive paths. Analytical individuals rely on ESE in the 'planning', 'marshalling' and 'implementation' stages of new venture creation, while intuitive individuals rely on ESE in the 'searching' stage.
Krekar and Coric (2013)	Chen et al. (1998); Liñán and Chen (2006)	ESE is a dynamic construct that changes along with changes in entrepreneurial status. Those who are seriously planning to or actually became entrepreneurs have a significantly higher level of ESE than those who remained non-entrepreneurs.
Lucas and Cooper (2012)	Lucas et al. (2009)	ESE has a motivational value, predicting the perceived value of entrepreneurship. Those with numerous role models have higher ESE. Men have higher ESE. The constructs of ESE and feasibility are separate constructs. They also have separate and independent effects on EI.
McGee et al. (2009)	McGee et al. (2009)	Nascent entrepreneurs exhibit higher levels of ESE.
Moriano et al. (2012)	Moriano (2005)	ESE is a significant predictor of EI across the whole sample.
Murnieks et al. (2012)	Zhao et al. (2005)	There is a positive correlation between passion and ESE, suggesting that an entrepreneurs' passion may be an important driver of increased ESE.
Naktiyok et al. (2010)	DeNoble et al. (1999)	ESE has a significant and positive effect on EI.

(continued)

Table 20.1 (continued)

Authors	Scale	Key findings
Nwankwo et al. (2012)	Chen et al. (2001)	ESE has a significant and positive effect on EI. Gender-role orientation is also a significant factor in EI; males engage more in entrepreneurial activities.
Peng et al. (2012)		The perceived subjective norm of university students has a positive influence on their entrepreneurial attitude and ESE; and all these factors influence EI.
Pihie and Bagheri (2011)	DeNoble et al. (1999)	Teachers display higher ESE compared to students. Suggests that improving teachers' competence in transferring their ESE to students is necessary.
Pihie and Bagheri (2013)	Scherer et al. (1989)	Promotion focus and ESE has a significant and positive effect on EI. Students from public universities had significantly higher entrepreneurial regulation and intentions than their counterparts from private universities.
Piperopoulos and Dimov (2015)	Lucas and Cooper (2004)	Higher ESE is associated with lower EI in the theoretically oriented courses, and higher EI in the practically oriented courses.
Shook and Bratianu (2010)	Krueger et al. (2000)	ESE has a significant and positive effect on EI
Slavec and Prodan (2012)	Chen et al. (1998)	ESE has a significant and positive influence on small firm debt financing
Trevelyan (2011)	DeNoble et al. (1999)	ESE has a direct, positive impact on effort in entrepreneurial activities, regardless of the type of task entrepreneurs engage in.
Tumasjan and Braun (2012).	McGee et al. (2009)	A 'promotion focus' positively influences opportunity recognition. Adopting a promotion focus can offset the negative effects of low creative self-efficacy and ESE on opportunity recognition.
Urbig et al. (2012)	Wilson et al. (2007)	Higher ESE is correlated with more investments made in general, both in destructive and productive scenarios.
Vazquez et al. (2009)	DeNoble et al. (1999), Kolvereid (1996), Krueger (1993)	Final-year students are not more inclined than first-year students to choose entrepreneurial careers (lower intention), but they feel more confident to start a business (higher ESE).
Zainuddin et al. (2012)	DeNoble et al. (1999), Liñán and Chen (2006), Ajzen (1991)	Specialized entrepreneurship education with ICT exposure significantly and positively affects a student's ESE.
Zellweger et al. (2011)	DeNoble et al. (1999)	Students with high levels of ESE are less likely to become employees than to become successors. Students with family business background have higher ESE.

skills and abilities may still be limited when using these scales. Certainly, different educational approaches within EE have very different learning goals. Hence, it is important that these approaches are assessed and evaluated on the right dimensions (Drnovšek et al. 2010; Moberg 2013, 2014; Piperopoulos and Dimov 2015).

20.3.1 Challenges with Current ESE Measures

One ESE scale that has gained a lot of recognition during the past years is the scale developed by McGee and colleagues which was published in 2009 and hence not discussed in the original chapter. This scale offers some advantages compared to the two more established scales. One of the main improvements with this scale is its strong focus on the dimensionality of ESE in combination with a clear theoretical foundation for this dimensionality. The sub-dimensions in the scale cover the different skillsets required in different stages of an entrepreneurial venture: searching, planning, marshalling, implementing, and they link back to previous studies such as the work by Stevenson and colleagues (1985). McGee et al. use structural equation modelling techniques for factor analysis, thereby thoroughly gauging the constructs' convergent and discriminant validity. Critics question the clear-cut division into separate skillsets for separate phases, arguing that entrepreneurship and entrepreneurial activities can hardly be structured into linear processes (Neck and Greene 2011). However, when it comes to educational initiatives within the field, such a division actually makes sense, since learning goals are usually focused and divided accordingly into basic entrepreneurial activities that Shane and Venkataraman (2000) bucketed into the broad topics of exploration, evaluation and exploitation.

Compared to the other two established scales, the McGee et al. scale offers a major improvement regarding dimensionality, which may explain why it is today regarded as one of the most popular and established ESE scales. There are, however, examples of consecutive studies, which had problems with replicating the dimensionality of the scale (see, for example Karlsson and Moberg 2013; Stromayer et al. 2012).

Furthermore, just like the two other scales, the McGee et al. scale focuses on skills and abilities that are important when starting a new venture.³ This focus makes the scales problematic to use when evaluating educational initiatives which have a broader focus on fostering entrepreneurial skills and abilities that are useful in many different contexts beyond the one of starting a new venture. In addition, the same focus also creates a problem with jargon bias in programme evaluations (Peterson 2000). Quantitative programme evaluations require a control group. However,

³This is also the case for the fairly popular ESE scales developed by Lucas and Cooper 2004 and Zhao and colleagues, 2005. These scales have been used in three, respectively, two studies in our literature review.

participants in an ESE control group cannot be expected to have the sufficient knowledge about the concepts used in these scales and can therefore not be expected to evaluate their ability in a meaningful way (Moberg 2013). One can only imagine how a student with a lack of knowledge about new venture creation would struggle with replying to the following statement from the DeNoble et al. scale (1999)—the most commonly used ESE scale in our literature review: *Please assess your ability to develop contingency plans in order to backfill key technical staff.*

20.3.2 Suggestions for Advancing ESE Measurement

One way to overcome the problems with jargon bias is to include individuals with no start-up experience and with a low level of other types of entrepreneurial experience, when developing or refining the ESE scale. The ESE scale developed by Moberg (2013, 2014) is an attempt to do this. This scale is based on the three established ESE scales presented before, but the wording of the items is more neutral, which facilitates its use in programme evaluations of many different educational initiatives within the field, at different educational levels, and in different country contexts (Moberg et al. 2014; Redford et al. 2015). The general focus of this scale also allows for comparative studies between different approaches in the field. This generality could, however, also be criticized since it diverts from Bandura's original idea with a narrow task-specific self-efficacy (Bandura 1997; McGee et al. 2009). In order to properly evaluate educational initiatives within the field, the scales used should preferably reflect the specific learning goals of a particular programme as closely as possible. This reasoning implies that if the focus of the programme is to educate web entrepreneurs, social entrepreneurs or intrapreneurs, the dimensions in the scale used in the evaluation should reflect the respective differences in context. In the next section, we will further discuss the heterogeneity of the field and present how different educational initiatives in entrepreneurship can be expected to influence different types of students' level of ESE.

20.4 Advancing the Contextualization of Entrepreneurial Self-Efficacy

In the previous sections, we have addressed recent developments in the measurement of ESE. As part of this discussion we pointed to the fact that the diversity of EE may need diverse or broader measures for ESE. In this section, we nuance this discussion to first consider how different approaches to EE may affect ESE and second, to introduce empowerment as a method for increasing ESE. Finally, we raise a number of concerns about the challenges presented by higher education structures and policies.

20.4.1 *ESE and Different Approaches to Entrepreneurship Education*

The growth of entrepreneurship programmes offered all over the world at higher education institutions (HEIs) is based on the implicit assumption that EE can contribute to the development of students' entrepreneurial attitudes, abilities and skills, and hence their intentions to create new businesses (Gibb 2002; Kuratko 2005; Neck and Greene 2011; Piperopoulos and Dimov 2015). However, having a closer look at existing research, we find mixed results (e.g. Krueger and Brazeal 1994; Oosterbeek et al. 2010), which might be attributed to the fact that "*prior empirical studies have largely treated EE as an undifferentiated whole*" (Piperopoulos and Dimov 2015: 971). Acknowledging that EE is delivered in very different ways, and that ESE is a multidimensional construct, we would expect that different approaches have varying effects on the different dimensions of ESE. So, if we look at the most dominant modes of delivering EE, we ask where would we expect to find the highest impact on ESE?

The past 10 years alone have witnessed not only a significant increase in the number of entrepreneurship courses in HEIs but also in the way that these are designed and delivered. We therefore see the need to extend on the original "about, for and through" framework proposed by Scott et al. (1998) and further popularized by, among others, Hannon (2005) and Kyrö and Carrier (2005), and separate out an additional category from the original 'through' category. This is necessary because in some HEIs it is simply not possible to implement a course in which the students actually 'do' entrepreneurship, or it may be too big a step for students to be thrown directly into the deep end, which is what 'teaching through' usually involves. Instead, course facilitators usually subject students to interventions that mimic what entrepreneurs do. We call this category 'learning from' entrepreneurship. The framework suggested in Table 20.2 therefore consists of four categories: (1) education *about* entrepreneurship, (2) education *for* entrepreneurship, (3) education *from* entrepreneurship and (4) education *through* entrepreneurship. The former two represent the traditional teaching approach by focusing on the transmission of theory and skills (instructor and curriculum centric) that are required for *understanding* how to start a business. The latter two have a process character and emphasize the mindset, capabilities and knowledge needed to start a venture by putting a premium on *experiencing* entrepreneurship (learner centric). A further differentiating characteristic is that the non-process courses rely heavily on pedagogy, whereas process courses extensively emphasize the principles of andragogy.⁴ Table 20.2 summarizes the differing content, approach and learning goals of each course type.

As mentioned earlier, some entrepreneurial skills and abilities that we aim to teach our students are of a more cognitively oriented character (e.g. the planning

⁴ Andragogy is the theory and practice of educating adults based on the assumption that adults are self-directed and autonomous learners and instructors are facilitators of lifelong learning. Andragogy is therefore much more learner centric.

Table 20.2 A four-category framework for entrepreneurship education^a

	Non-process courses		Process courses	
	About	For	From	Through
Content (what we teach)	<ul style="list-style-type: none"> • Entrepreneurship theory 	<ul style="list-style-type: none"> • Skills (accounting, finance, marketing) • Business plan 	<ul style="list-style-type: none"> • Mimicking entrepreneurial behaviour based on the principles of scaffolding experiences 	<ul style="list-style-type: none"> • Doing entrepreneurship
Approach (how we teach)	<ul style="list-style-type: none"> • Lecturing • Passive learning • Instructor is the initiator of knowledge transfer 	<ul style="list-style-type: none"> • Lecturing • Knowledge transfer from instructor to student 	<ul style="list-style-type: none"> • Simulation of real-life entrepreneurial activities • Learning by doing • Instructor is the facilitator 	<ul style="list-style-type: none"> • Real-life experiences • Learning by doing • Instructor is the facilitator
Learning goals	<ul style="list-style-type: none"> • Learning about the historical past of entrepreneurship research 	<ul style="list-style-type: none"> • Gaining an understanding about what entrepreneurship skills are needed in real life 	<ul style="list-style-type: none"> • Building an understanding of the individual in the entrepreneurial learning process 	<ul style="list-style-type: none"> • Building entrepreneurial capacity and understanding of the individual in the entrepreneurial learning process
Impact on entrepreneurial self-efficacy	<ul style="list-style-type: none"> • Cognitive oriented skills 	<ul style="list-style-type: none"> • Cognitive oriented skills 	<ul style="list-style-type: none"> • Cognitive and non-cognitively oriented skills 	<ul style="list-style-type: none"> • Cognitive and non-cognitively oriented skills

^aIt is important to note that courses can combine two or more of the four displayed approaches. For example, a ‘for’ course on business plans might contain elements of a ‘from’ course by assignment if students actually interview potential customers and ‘from’ course might include elements of an ‘about’ course to theoretically contextualize activities

and finance skills, and to some degree the human resources skills), since they contain a high amount of declarative knowledge. This makes them fairly easy to codify and teach in ‘about’ and ‘for’ courses. A significant part of the skills and abilities used when practicing entrepreneurial activities are, however, of a more non-cognitive character (e.g. the creativity and marshalling of resources dimensions), which typically contain a high amount of tacit knowledge making them hard to codify and therefore rather suited for ‘from’ and ‘through’ courses. Therefore, we suggest that ‘about’ and ‘for’ courses may have a weak impact on student’s ESE, while ‘from’ and ‘through’ courses may have a strong impact on student’s ESE. This impact might be both positive and negative depending on the student’s experience in the course. It might be positive as the students become familiar with typical tasks and challenges in the entrepreneurial process and acquire tools that can help them in their entrepreneurial endeavour. However, other students might experience the exposure to the complexity of an entrepreneurial process and their own vulnerability as negative and therefore their ESE might decrease. Hence, as instructors we play a crucial role in shaping student experience of entrepreneurship activities in the classroom. In the following, we want to introduce empowerment as a method to support students’ entrepreneurial experience in the classroom.

20.4.2 Empowerment as a Method for the Entrepreneurship Classroom

Previous literature outside entrepreneurship has provided strong evidence for a causal relationship between empowerment and self-efficacy in, for example education (Zimmerman et al. 1996), health (Rawlett 2014) as well as leadership (Conger and Kanungo 1988). Nevertheless, so far there has been scant research into empowerment in entrepreneurship outside the area of micro finance. This is somewhat surprising as empowerment is commonly associated with achieving power over something that you held no power over previously (Mosedale 2005), and entrepreneurship prototypically provides individuals with power over their own lives in a different way than if they were dependent on an employer. Within general education research empowerment has received more attention and Denti (2012: 8) defines empowerment as “*providing (...) students with a sense of confidence, capability, competence and self-esteem to meet life’s challenges*”. So how can entrepreneurship instructors use empowerment as a technique to influence student’s ESE?

In their seminal work on empowerment and self-efficacy Conger and Kanungo (1988) state that empowerment practices must directly provide information to the four self-efficacy categories that we discussed more intensively in the original book chapter: (1) mastery experiences, (2) vicarious experiences, (3) social/verbal persuasion and (4) judgement about physiological state. Although there is still only little empirical work including the antecedents of ESE, there is some evidence that most of these antecedents are actually relevant for EE (Mauer et al. 2013). The fol-

lowing vignette illustrates how an instructor can create a scaffolded environment in which entrepreneurship students can learn to cope with uncertainty and ambiguity by being progressively pushed further and further out of their comfort zone. We then proceed to discuss empowerment techniques that instructors can use and that relate directly to individuals' self-efficacy expectations and that can be used in any entrepreneurship classroom. Bandura (1986) describes these processes as instilling a 'robust sense of coping efficacy'. In order to achieve this 'robust sense of coping efficacy' modules need to be structured in graduated steps, slowly taking participants to more and more complex activities, during which corrective feedback is provided, and ensuring that participants have a positive feeling of achievement after having gone through each step.

By giving students little tasks that are designed to make them feel successful in the beginning and then progressing to more and more challenging tasks, students

One of the authors uses an intervention called flash mob to illustrate Sarasvathy's (2001) principles of effectuation at the end of the semester (Neergaard et al. 2014). At this point all students have become well familiarized and they have successfully completed many other entrepreneurial tasks that have supported their belief in their ability to perform entrepreneurial tasks (mastery experiences). The instructor prepares the students by discussing with them some of the entrepreneur's qualities that they identified in previous classes, relating these to the principles of effectuation. She talks about the need to take risk and control of the 'now' to secure buy-in/stakeholder commitment by persuading other people to participate. She then shows the students videos from flash mobs of former students (vicarious experience). Furthermore, she instructs the students to plan and execute a flash mob and gives them four criteria that they will be assessed on: the flash mob (1) needs to have a 'message', (2) should build on the skills or experiences of one or more group members, (3) needs to include external people that have bought in to the idea and (4) needs to be carried out in a public place and video recorded. These four criteria are then used by the instructor in the debrief session, which provides constructive feedback (social and verbal persuasion). Students are nervous, but both due to the timing at the end of the course and because they carry out a 'trial' in class (mastery experience), they feel secure and excited rather than afraid (judgement of physiological condition).

are provided with "*individual authentic mastery experience directly related to the job*" (Conger and Kanungo 1988: 479). Even if they are set up to fail, it is not going to affect them adversely for the rest of their lives if they know that the activities take place in connection with a course. Instead, it enables them to interpret the experience positively, which according to Bandura (1997) is central, if it is supposed to serve as a mastery experience.

Most often, vicarious experiences in entrepreneurship have been associated with having parents, who are or were entrepreneurs (learning by example). However, if we define *vicarious experience* as referring to “observing similar others who perform successfully on the job” (Conger and Kanungo 1988: 479) then educational practice reveals a great variation of possibilities as to how vicarious experiences can be created. For example, students can be provided with the opportunity to observe successful entrepreneurs either by site visits or the instructor can bring students and peers from former years into the classroom that have already made the transition into entrepreneurship.

Entrepreneurship students can also be empowered by *verbal persuasion*, feedback and words of recognition. In order for social and verbal persuasion to work in an educational environment, recognition needs to be clearly defined, directed and measurable, so that the student understands what s/he is doing well. As in the vignette earlier, students were introduced to four feedback categories, which gave them a clear guideline and understanding of what they would be recognized for. Thus, in the educational classroom the instructor plays a crucial role both in providing social and verbal persuasion and helping the students believe that they have the capacity to do well. Furthermore, among students appreciative inquiry techniques (see, for example Cooperrider and Whitney 2005) can be used to create a positive atmosphere where students provide constructive feedback and learn and develop together.

Judgement about *physiological state* deals with eliminating emotional reactions to subjective threats as well as understanding your emotional reactions. As pointed out in the original chapter, there has been a reluctance to deal with emotions in entrepreneurial teaching environments; however, this is slowly dispersing as more and more research shows the importance of working with emotions (see e.g. Shepherd 2004; Lackéus 2014; Neergaard et al. 2014). Lowering emotional arousal state of students is also important for empowerment to take place. Creating a positive trusting atmosphere in the classroom, communicating clear expectations, providing students with a framework that they can succeed in (e.g. selecting entrepreneurial projects that are realistic) are elements that the instructor can use to avoid unnecessary emotional arousal. Creating this positive atmosphere does not mean that students should not be pushed outside their comfort zone. The nudging literature might provide instructors with valuable insights for tools and processes (e.g. Neergaard et al. 2014).

In sum, we believe that empowerment is a valuable lens for education targeted towards increasing ESE in the broader sense of entrepreneurship. It can help us acknowledge the complex, challenging and sometimes frustrating character of the entrepreneurial task by making sure that students do not experience constant overstraining, while still pushing them step by step out of their comfort zones. If we take empowerment for entrepreneurship as the entrepreneurship educator’s task, ESE allows for both the development of levers for empowerment as well as for adequate evaluations of the respective teaching formats. To support this development, we may also want to make use of digital tools that have started emerging over the past years. Those tools may assist educators in performing their own tailor-made programme evaluations (Lackéus 2014; Moberg 2014). The flexibility of these digital

tools will probably make assessment studies within the field more precise and specific. At the same time, they may help with the empowerment of the students by helping with self-reflections and tracking of their personal development. If this is the trend, measurement of ESE will further pluralize, a process that our literature review detected to develop since 2009. While this may have advantages for the field of entrepreneurship education, it may however make it somewhat more difficult to build a solid cumulative knowledge base within the field.

20.5 Conclusions and Outlook

In this chapter update, we have been working under the assumption that EE can help us increase entrepreneurial self-efficacy. In this concluding section, we would like to broaden up again by asking if the increase in ESE should actually be the main focus of EE. In order to provide suggestions, we briefly address the key stakeholders in the EE context: the students, the educators and the institutional system. Rather than focusing on ESE per se we should focus on (1) student needs; (2) alignment of course content, approach and learning goals and (3) institutional development. We discuss these interdependent issues in the following and add future research questions, which we hope will inspire other researchers.

Student needs: According to Bandura (1997) as well as Lucas and Cooper (2004) experiential and reflective methods, which are used in process courses, promote deep learning. Hence, we may conclude that all entrepreneurship courses should be process courses, as these courses should in theory have a higher impact on ESE. However, educators should keep in mind that students have very different interests when choosing entrepreneurship courses. These interests may range from an interest in entrepreneurship as a research field, an interest in broadening their curricula, an interest in becoming part of the “entrepreneurship hype”, all the way to an interest in becoming an entrepreneur. In addition, as we cater to a broad range of student interests and needs we should not shy away from educating students who wish for a rather theoretical understanding that can best be delivered in ‘about-’ or ‘for’ courses, even though these courses might not increase their ESE as much as other courses could do. In consequence, not all course formats should be assessed based on self-efficacy development.

Course alignment: Aligning teaching goals, content and pedagogy to cater for different student interests is favourable towards a superordinate goal to increase ESE through EE. Course set-up and assessment should be in line, which implies that we cannot use the same form of examination in ‘about’ courses and in ‘through’ courses. Knowing that assessment is an integral part of higher education, it will be important to further investigate in which way assessment per se may already have an impact on ESE. Furthermore, many educators are worried that their students’ level of ESE will decrease when they increase their knowledge about the complexity that characterizes entrepreneurial activities, and that they had an unrealistic view of their competences when they started in the educational programme (Graevenitz

et al. 2010). This does not alter the theoretical assumptions of self-efficacy theory, but it may complicate programme evaluations. In order to follow the development of the students and to assess how different educational interventions influence their ESE, it may be a good idea to collect data on the students' level of ESE at multiple occasions. Further research needs to go into carefully carving assessment methods in order to not diminish ESE by using the wrong assessment. Mixed method longitudinal research with a strong emphasis on qualitative research could be stressed to help with advancing a fully integrated design of targeted ESE teaching formats. Gaining further scientific evidence will in consequence also help with shaping the institutional context in which we create our teaching formats.

Institutional development: We have presented a comparably sophisticated differentiation of entrepreneurship education formats. Those formats are still quite often of experimental nature and partially at odds with standard curricula or with the expectations of accrediting institutions of all kinds. Here it is important to carefully describe and communicate the mechanisms at play and the implications for dominant regulatory aspects. Institutional expectation towards entrepreneurship education is often limited to an increase in the number of start-ups. However, the working world is changing, and entrepreneurial competencies are on its way to become a central element in many job descriptions. Finally, we see a need to go beyond higher education institutions in working on ESE. In that sense, we assume that we have already learnt a lot from the university context to also help the educational system in other parts to foster ESE.

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Part IV
**Cluster Four Entrepreneurial Alertness,
Opportunity Identification and Behavior**

Chapter 21

Entrepreneurial Alertness and Opportunity Identification: Where Are We Now?

Connie Marie Gaglio and Susan Winter

21.1 Introduction

Since its inception, entrepreneurship has struggled with the academic version of a new venture's liability of newness; the field was considered pre-paradigmatic (Ireland et al. 2005b), bereft of theory or conceptual frameworks (Phan 2004; Zahra and Dess 2001) and so lacking in understanding that investigators could not agree on what constituted the phenomenon of interest: any kind of self-employment? New venture creation? Corporate venturing? Something else? All of the above (Gartner 1990; Ireland et al. 2005a; Low 2001; Vesper 1982)?

In 2000, Shane and Venkataraman wrote an article that they hoped would redress the discipline's liability of newness and legitimize the study of entrepreneurship as an area of scholarly interest rather than as "only a research setting or teaching application" (p. 218). Their declaration of independence asserts the discipline as one uniquely devoted to "the scholarly examination of how, by whom, and with what effects opportunities to create future goods and services are discovered, evaluated, and exploited ... the field involves the study of the sources of opportunity, the processes of discovery and evaluation, and the exploitation of opportunities and the sets of individuals who discover, evaluate and exploit them" (p. 218).

Eight years later, over 150 articles about the entrepreneurial opportunity process have been published in scholarly journals including several that summarize and review the output (e.g., Compans and McMullen 2007; Hisrich et al. 2007;

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McMullen et al. 2007; Sarasvathy et al. 2003). This chapter examines whether and how the apparent trends emerging from this literature are useful in terms of improving our understanding of how entrepreneurs think and reason with regard to opportunity identification.

The Trends. Examination of the 150 plus articles reveals three trends in current scholarship: (1) the application of the principles and dynamics of cognitive psychology; (2) the contemplation of the ontological nature of entrepreneurial opportunities; and (3) the re-emphasis of the social dimensions of the process. In addition, another trend is clearly evident although it appears to be unintended: (4) a widening schism between the theoretical and operational definitions of entrepreneurial opportunities.

The focus of this chapter is to explore whether and how useful these trends are in advancing our understanding of entrepreneurial cognitive processes. As such, the literature review is selective, not comprehensive. Many interesting articles fall outside the bounds of this focus; apologies to those colleagues in advance.

21.2 Trend #1: Cognitive Psychology

Undoubtedly, the biggest trend in the past 8 years has been the application of the principles and dynamics of cognitive psychology to entrepreneurship (Hisrich et al. 2007; Mitchell et al. 2004, 2007). One might assume that this inherently precipitated a dramatic improvement in our understanding of the content and workings of the entrepreneurial mind. Not quite. As will be shown, progress has been hampered by what should be relatively tangential debates occupying center stage. However, on balance, consideration of cognitive dynamics is leading to higher quality questions about the entrepreneurial opportunity identification process. The net result is skewed toward questions because the number of theoretical articles outnumbers the empirical pieces.

The fundamental cognitive question regarding opportunity identification is how market environments are represented and interpreted in the minds of entrepreneurs such that they perceive and exploit opportunities (Shaver and Scott 1991). More specifically, a cognitive explanation of the entrepreneurial opportunity process must answer (1) whether the content of an entrepreneur's mental model (schema) of a business situation or market environment differs significantly than that of non-entrepreneurs; (2) whether the entrepreneur uses this information differently than non-entrepreneurs; and (3) whether these unique properties of the mental models (content and uses) lead to the identification of more or qualitatively superior opportunities.

Based on Kirzner's theory of entrepreneurial alertness and opportunity identification, Gaglio and Katz (2001) developed a comprehensive profile regarding the likely contents of an entrepreneur's mental model of the business world and described the probable perceptual and information processing processes an entrepreneur would use to develop new innovative goods, services, and processes. Consistent with economic theory, they assume that the broad content of an entrepre-

neur's mental model of the marketplace does not differ significantly from that of other market actors because information about how markets work and what is "going on" must be rather widely available or the market process could not work at all. They argue that the significant differences between the entrepreneur and non-entrepreneur lay in what each chooses to notice, then in the importance or weight each gives to new information, and, finally, in the meaning each creates. The authors further argue that these differences are driven by the fact that the entrepreneur builds his or her mental model of the marketplace through the use of another mental model (alertness) which directs the entrepreneur's attention to any kind of stimuli or cue of change or anomaly and then directs interpretation of this information in atypical ways. Gaglio and Katz characterize alertness as a chronic schema meaning that the entrepreneur uses it habitually to the point where it is second nature, seemingly unconscious, unless someone else calls specific attention to it. The habitual or unconscious deployment creates the impression that alertness is effortless.

The attempt to translate entrepreneurial alertness into a cognitive process has not been successful to date as evidenced by the fact that far more scholarly attention has been given to a relatively tangential issue—the question of effort—than to more essential cognitive issues such as (1) whether entrepreneurs and non-entrepreneurs differ in the perception and interpretation of change and anomalies signals such as those Schumpeter (1950) and Drucker (1985) described; (2) whether entrepreneurs and non-entrepreneurs differ in the content of their schema about their industries, societies, what is going on, and so forth; (3) whether there are important behavioral differences in the cognitive operations performed on new and existing schema content; and (4) whether certain kinds of cognitive operations are more useful and reliable for transforming schema content into ideas for innovative products and services and ideas in action.

21.2.1 Search Effort

Unfortunately, Kirzner (1979) himself led the field to this detour with his definition of alertness as "the ability to notice without search opportunities that have hitherto been overlooked" (p. 48); the characterization conveys an image of pleasant strolls in a sunny meadow where one meets the opportunity leprechaun or as Demsetz (1983) phrased it, dumb luck. The face validity of such a conceptualization is preposterous and runs counter to the anecdotal evidence of people deliberately looking for business opportunities (Koller 1988; Peterson 1988).

Fiet (2007) takes the anecdotal evidence one step further by elaborating on the likely sequence of events and decision points involved in searches through his development of the theory of constrained systematic search. Attempting to be consistent with the cognitive principles of miserliness and bounded rationality, which state that people usually do the minimum cognitive work necessary to take action, he assumes that people who are searching for new venture ideas limit themselves to information sources with which they are familiar, usually because of prior experi-

ence and knowledge. There is empirical work demonstrating that constrained systematic search can be taught (DeTienne and Chandler 2004; Fiet 2002) and there is some evidence that some serial entrepreneurs do engage in systematic search (Fiet et al. 2004). These findings and the earlier anecdotal evidence led to the conclusion that deliberate searching is a valid route to opportunity identification.

However, evidence in support of systematic search does not by itself rule out the possibility of effortless search. Gaglio and Katz (2001) noted that the lack of effort could be attributed to the entrepreneur's use of a chronic schema. Shane (2000) proposes that effortless discovery can be explained as the result of the interaction between a person's idiosyncratic knowledge store and market events. Essentially, a person's background allows (or inhibits) him or her to apprehend the value of new information (the market event) and thus can notice without search. He offers evidence from a quasi-experiment demonstrating that idiosyncrasies in participants' prior knowledge led each to interpret information about a new invention differently; these differences led to different results. In some cases, participants did not discover any business concept based on the new invention but other participants did and in each of those cases, the concept was different from those identified by others. Unfortunately, his study does not really address the question of search versus discovery (his participants were given the information about the market event) so much as demonstrate that participants' prior knowledge (existing mental models) directs interpretation of information. This is important evidence, just not germane to the question of effort.

The debate between deliberate search and effortless discovery sparked a flurry of research activity; what does the evidence show? First, *we have evidence that people scan their environments* and that some entrepreneurs feel that actively searching for new ideas is essential to their success (Fiet et al. 2004; Ko and Butler 2007). In at least some instances, the intensity of the search effort is positively associated with the number of potential business ideas articulated (Ucbasaran et al. 2008). It appears that the *motivation for the search—internal versus external—does not have an impact* on the success of the venture (Singh et al. 2008).

Second, amount of scanning and what one scans appear to depend in some measure upon the degree of change or turbulence (Stewart et al. 2008; Tang 2008a) the entrepreneur perceives in his or her social, technological, economic, or personal environment. The area(s) perceived most volatile will be scanned more frequently than more stable areas. Most importantly, *search activity appears to be heavily influenced by the ease with which information is readily available* (Stewart et al. 2008). Regardless of environmental circumstances and degree of turbulence, if information is readily accessible, deliberate scanning is more likely. If the information is perceived to be inaccessible or difficult to obtain, active search is less likely to occur. This finding is an illustration of the principle of cognitive miserliness.

However, there is other evidence indicating that when an entrepreneur perceives his or her social and economic environment to be flush with resources to support new ventures, he or she is less likely to engage in deliberate search (Tang 2008b) but rather allow discovery to occur in time. *The decreased likelihood of scanning when information is not easily accessible and the likelihood to use discovery in munificent environments suggest that entrepreneurs are probably using the availability heuristic (shortcut) to drive this stage of the opportunity identification process.*

Not surprisingly, at least one investigator (Berglund 2007) found that, in response to the same market stimuli (rise of the mobile phone) some entrepreneurs used active search methods while others conformed to the discovery process. Indeed, a consensus appears to be forming within the discipline that both deliberate search and effortless discovery have a role in the opportunity identification process and if there is a salient question, it is which, when (Ardichvili et al. 2003; Casson and Wadeson 2007; Fiet 2007; Tang and Khan 2007; Yu 2001)? However, it would be more useful to the field if scholars can abandon this tangent altogether and concentrate on the more important questions such as how the availability heuristic affects the opportunity identification process (keeping in mind it could have a positive effect) or focus on the fundamental questions about the cognitive processes associated with opportunity identification that were enumerated earlier. For example, does the content of an entrepreneur's mental model (schema) of a business situation or market environment differ significantly from that of non-entrepreneurs?

21.2.2 Mental Models: Content

Shane's quasi-experiment demonstrated that differences in pre-existing mental models influence how new information is interpreted. This underscores the need to understand these mental models: their content, how they are formed, how they influence interpretation of new information, and whether and how they themselves are changed. Yet very little is known about an entrepreneur's mental model which, in the entrepreneurship literature, is also called schema (Gaglio and Katz 2001), script (Chiasson and Saunders 2005; Stewart et al. 2008), human capital (Fiet 2007), or the mean-ends framework (Kirzner 1979).

In one of the few empirical pieces directed at schema content, Baron and Ensley (2006) compared the differences between novice and serial entrepreneurs' schema regarding the opportunity to start a new venture. The differences in content clearly reflect experience as a venture founder. Serial entrepreneurs are more likely to mention and give weight to factors regarding the execution of a successful business: speed and ease of generating cash flow, ability to use networks, and so forth while novice entrepreneurs give more weight to the novelty and quality of the product or service idea. Bishop and Nixon (2006) compared the evaluation criteria of experienced venture capitalists and pre-nascent entrepreneurs and found that both groups essentially used the same criteria but the importance given to each item differed significantly by group.

Schema or mental models are representations of knowledge and so the recent empirical attention given to the influence of human capital on the opportunity identification process is relevant to this discussion. Researchers (Corbett 2005; Fiet 2007; Tang 2008a; Shepherd and DeTienne 2005; Ucbasaran et al. 2008) have typically distinguished between general human capital (generalizable knowledge acquired through education, life experience, social relations, and so forth) and specific human capital (technological experience, industry expertise, and so on). The

findings indicate that the greater the amount of knowledge, whether general or specific, the higher the number of opportunities study participants report (Corbett 2005; Ucbasaran et al. 2008). However, specific knowledge, particularly knowledge about customer problems, appears to influence the opportunities' degree of innovation (Shepherd and DeTienne 2005). There is also some evidence that specific knowledge influences the decision to pursue opportunities (Ucbasaran et al. 2008) although this effect appears to be mediated by the interaction of an individual's learning style and the situational demands (Dimov 2007).

The evidence raises more questions than it supports or disconfirms any theoretical position. The questions are especially useful for improving our understanding of the opportunity identification process and so deserve to be highlighted. First, the evidence indicates that, quite simply, *in order to discover or create opportunities, entrepreneurs have to know something; knowledge matters*. What do entrepreneurs need to know? *Efforts should be made to specify and elaborate on the contents of general knowledge and specific knowledge* much as Baron and Ensley did for the mental model of an opportunity so that we can understand what entrepreneurs need to know.

To begin this effort, it is possible to make logical inferences about what should be in an entrepreneur's mental model of the marketplace. For example, if alertness requires environmental munificence for deployment, then the entrepreneur must have a mental model of munificence to guide the decision regarding the activation of alertness. Tang (2008b) suggests this model probably includes concepts about a diversified economy; about other entrepreneurs as role models; about solid financial communities; about government incentives for businesses; about supporting infrastructure; and about the availability of skilled resources. Hsieh et al. (2007) note that the potential for gain triggers alertness; therefore, an entrepreneur must have a model that includes concepts about gain and about the characteristics of high gain potential markets. Gaglio and Katz (2001) describe a constellation of interacting mental models that depict the society's economic system (roles, rules, criteria); the society's sociopolitical culture (trends, tastes, technologies), as well as a fairly extensive model of how and why the industry of interest works the way it does. Finally, those who emphasize the role of prior knowledge mention that the entrepreneur has unique knowledge of markets; ways to serve markets; customer problems or needs; long-run trends; depletion of resources; and gaps (Ardichvili et al. 2003; Berglund 2007; Casson and Wadeson 2007; Ko and Butler 2007; Shane 2000).

It is inconceivable that all this information has equal weight although the cognitive psychology of expertise (Chase and Simon 1973; Chi et al. 1982) indicates that it is the way in which information is organized in the mental model, particularly the number of connections made with other mental models, that matters most. Krueger (2007) recently challenged fellow scholars to move beyond our current stage of labeling and investigate the deep structures and the relationships among them. While Krueger is prescient in the general direction the discipline must take, it would be most useful to first test our implicit assumptions about schema content.

The association between the greater the amount of knowledge, the higher the number of opportunities reported also suggests that the issue of general intelligence, IQ, should be included in future studies rather than considered a third rail (Hisrich et al. 2007).

Third, *the fact that specific knowledge appears to have greater influence on the decision to pursue suggests that investigators should start to examine the mental models of different stages of the opportunity identification process* and not just the end point. Again, it becomes a question of what, when does one mental model facilitate or hinder the entire process from idea to venture or do different mental models come into play at different stages or perhaps have greater influence at different stages, as the evidence suggests? Perhaps the discipline is doing itself a disservice by investigating the opportunity identification process in terms of its end point, the opportunity to start a business?

Finally, the evidence *that the kind of specific knowledge influences an opportunity's degree of innovation* suggests the need to *begin distinguishing among types of opportunities* (radical, innovative, imitative, and so forth) because it is highly likely that cognitive processes will vary by type of opportunity in important ways. Fiet's (2007) scale of innovation is a useful starting point as an operational measure.

21.2.3 Mental Models: Creation and Change

Kirzner (1979) claims that the quintessential moment of entrepreneurship and opportunity identification is the entrepreneur's decision to break the existing means—ends framework (mental model) and create another one that incorporates the new information, the new understanding, the new meaning and value, the new opportunity. Other entrepreneurship scholars have noted the importance of new interpretations or sense making in the opportunity identification process (Dutta and Crossan 2005; Sarason et al. 2006a), and indeed Krueger's (2007) assessment of such deliberations led him to conclude that understanding how these models and other beliefs develop and change is the urgent scholarly question.

Based on the principles of cognitive dynamics, several skills and methods regarding schema alteration have been proposed: pattern recognition (Baron 2006); framing and reframing (Lumpkin and Lichtenstein 2005; Ward 2004); bricolage (Baker and Nelson 2005); and counterfactual thinking (Gaglio 2004). We beg our fellow scholars not to consider whether these skills and techniques are used; at least check, entrepreneurs are human and rely on human cognitive processes. It would be more useful for the field to focus on whether entrepreneurs use these skills and techniques differently than non-entrepreneurs and if so, to what effect and under what circumstances. Let us start with an assumption that the useful questions about changing mental models are questions of which, when.

Pattern Recognition. The discussion regarding search versus discovery raises the question of what people do with the new information they seek out or encounter, particularly if the new information represents something unusual or atypical. The most obvious choices are to ignore it or incorporate it by revising their existing mental models or creating entirely new ones (Gaglio and Katz 2001). Cognitive processes such as pattern recognition can help explain how people make sense of information when they choose not to ignore it. Pattern recognition (Baron 2006)

involves recognizing or creating relationships between currently unrelated pieces of information (e.g., the new information just acquired) in such a way that the relationship has meaning, can be connected to other mental models, and can guide action. For example, an alert entrepreneur comforting his or her small child who is crying after seeing desolate polar bears floating on shrinking icebergs might also create a pattern or connect the dots to the news heard on the Weather Channel a week earlier about the lack of rain in California resulting in government officials declaring a drought and start looking into desalinization processes and water right-of-ways.

There is evidence that *some entrepreneurs perceive themselves as looking to connect the dots among diverse pieces of information* (Baron 2006; Ko and Butler 2007), but this is not especially surprising because everyone engages in pattern recognition. It would be more useful to know whether entrepreneurs use the process differently such that it results in opportunity identification. Perhaps entrepreneurs are more likely to apply their pattern recognition skills to market environments while non-entrepreneurs apply their skills to other areas of life. If alertness is a chronic schema that directs attention to the unusual, then perhaps entrepreneurs simply look to connect the dots among these anomalies earlier and more often and perhaps even faster than non-entrepreneurs. It is also possible that connecting the dots among diverse pieces of information suggests that entrepreneurs are probably minimizing (perhaps even ignoring) the initial context in which the information was presented or uncovered, that is, the way in which the information was originally framed.

Framing. Cognitive psychologists (Fiske and Taylor 1991) note that the way in which information is presented or framed influences which mental models an individual will recall from memory and use for sense making and decision-making. The persistence and power of the effects of information framing are well documented (Kuhberger 1998). Evidence from three recent studies suggests some interesting and important directions for research about entrepreneurial cognition.

In an attempt to create the moment of Kirzner's pure entrepreneurial discovery several economists (Demmert and Klein 2003; Kitmann and Schiereck 2005) devised a cute little experiment in problem-solving that allowed for obvious solutions and a clearly "out-of-the-box" solution that could be considered a Kirznerian alertness-type insight. Being economists, they focused on the influence of financial incentives in producing the alertness response; what they discovered was the power of framing. Their instructions presented participants with a problem to solve; the experimenters learned that even those participants who provided the out-of-the-box solution reported that they perceived the situation as simply a problem to be solved. None of the participants considered framing the situation as anything else even when prompted during debriefing. While the experimenters bemoan their failure to operationalize Kirznerian discovery, they successfully demonstrate the power of framing. Actually, it is rather reassuring to learn that alertness does not require events to be framed as extraordinary in order to be evoked and used to create an effective and innovative solution.

However, and more importantly for entrepreneurship scholars, these experiments also reveal that there are limits to framing effects. The participants who had the out-of-the-box insight had to apprehend that a small step stool, once inverted, could be used to carry water. To do so, they had to see beyond the initial label (frame) for the

step stool. Cognitive psychologists explain that these participants did not suffer from functional fixedness, a cognitive bias to perceive objects and information in only one way or in only one relationship based on how first presented or encountered (Coleman 2001). In this experiment, most people saw the step stool and once they mentally labeled it, they could not imagine any other use except to stand on it (which would not help solve the problem). On the other hand, the alert respondents did not allow the object's label to limit their imagined uses for the stool. In everyday life, functional fixedness has a purpose (effectiveness and efficiency in response) but it is considered a major barrier to creative thinking and solutions (Stein 1989).

Ward (2004) examined the influence of initial framing on the solution's degree of innovation. He found that when problems are defined in abstract terms, solutions tend to be more innovative while problems that are defined in concrete terms tend to result in more familiar kinds of solutions. He theorizes that the presentation in concrete terms brings to mind very specific models (exemplars) that then limit thinking. Exemplars can be considered an example of functional fixedness for mental objects.

Thinking about framing as a kind of functional fixedness suggests that Yates's (2000) conceptualization of entrepreneurial alertness may be the most useful in guiding future investigations in alertness and opportunity identification. Yates believes that alert entrepreneurs simply understand and perhaps even assume that their beliefs about the way things work (the means—ends relationships or cause—effect connections in mental models) are probably incorrect and/or incomplete. Yates's entrepreneurs remain “alert” to the possibility that they may be surprised in any situation, that they may discover new relevant information that will require them to change their mental models—in cognitive terms, *entrepreneurs are especially sensitive to the problems engendered by framing effects and the functional fixedness bias and guard against them.*

Counterfactual Thinking and Bricolage. Guarding against framing effects and functional fixedness may be necessary steps for breaking the existing means—ends framework but they are by no means sufficient. Holcombe (2003) presses further and argues that all of the cognitive behaviors discussed so far are necessary but not sufficient. They lay the groundwork but are not themselves an entrepreneurial act. Whether one adopts the creativity or alertness or problem-solving or pattern recognition or any other explanation, at some point it becomes a question of what is the entrepreneur doing that breaks the existing means—ends framework and that changes his or her existing mental model of the world? We have little evidence but some suggestions about the probable cognitive dynamics.

Baker and Nelson (2005) provide the most direct evidence about the fact that at least some entrepreneurs are aware of their attempts to break existing mental models although their investigation focused on ventures that were already launched. The investigators observed that the founders whose firms that experienced growth showed a determined and conscious bias to test and push past the resources at hand (their existing means—ends framework). They describe several episodes in which *the entrepreneurs exhibit a “willful tendency to disregard limitations, commonly accepted definitions of material inputs, practices, and definitions and standards” (p. 334) in order to experiment with re-combinations of inputs, reordering sequences of events, and so forth* which the authors label examples of bricolage.

The study provides evidence that entrepreneurs may intend to undo and redo what exists but it does explain what or how entrepreneurs accomplished their intentions. Gaglio (2004) suggests that the use of counterfactual reasoning and mental simulations is the driving force of these events. These cognitive processes work directly on an individual's perceptions regarding a causal chain of events (e.g., means—ends). Gaglio's theoretical development appears to run counter to Baron's (2000) assertion that entrepreneurs do not engage in counterfactual thinking but in fact, Baron only examined the counterfactual processes associated with regret which is only one of countless everyday situations in which people use counterfactual thinking. It is used most often to solve problems. However, relative to opportunity identification, Gaglio proposes that entrepreneurs who, through active search or discovery, identify anomalies or unexpected events (which are counter to the existing facts, counterfactual) will place that information into their mental models and mentally imagine what would happen. This kind of mental play leads to the identification of market opportunities.

There is considerable room to expand this line of theory and research; its potential usefulness lay in shifting the focus of research to what entrepreneurs are doing and on re-conceptualizing the entrepreneur as more than a response to stimuli. At first glance, this sounds most useful but the discipline took another less than useful detour into the consideration of the ontological nature of opportunities.

21.3 Trend #2: Ontological Nature of Entrepreneurial Opportunities

The question of whether an entrepreneurial opportunity can exist independently of the entrepreneur appears to be a lightning rod for the discipline—nearly 10% of the articles published in the last 8 years specifically address this issue (e.g., Baker and Nelson 2005; Berglund 2007; Buenstorf 2007; Chiasson and Saunders 2005; Companys and McMullen 2007; Endres and Woods 2007; Fletcher 2006; McMullen et al. 2007; Sanz-Velasco 2006; Sarason et al. 2006a; Sarasvathy et al. 2003; Shane 2004).

From a cognitive perspective, the issue is a bit of a tangent because the act of perception and interpretation inherently renders all human activity subjective. The mystery lay in the fact that we manage to effectively interact with others and that the world generally works despite the fact that each person introduces his or her subjectivity at every turn. However, an individual's "subjectivity" is guided by his or her mental models which are the results of worldly interactions, so what is presumed subjective actually has a strong social, if not objective, flavor. Cognition then is both social and individual (Fiske and Taylor 1991). The discipline appears to be resolving the ontological debate in this direction by importing the theories of social construction (Fletcher 2006; Gartner et al. 2003; Gaglio and Katz 2001) and structuration (Chiasson and Saunders 2005; Sarason et al. 2006a) or concluding that the opposing sides in the debate are actually complementary (Companys and McMullen 2007).

Yet the debate proved useful in that it highlighted the need for the discipline to address two issues if we want to improve our understanding of opportunity identification. As scholars pulled in examples of subjective, objective, and enacted opportunities in support of their respective positions, it became clear that they were more often than not considering opportunities of a different scale. This implies that there may be more than one kind of entrepreneurial opportunity. Second, by proposing social construction or structuration theory as a resolution to the controversy, scholars will need to direct more attention to the social dimension of the opportunity identification process.

21.3.1 More Than One Kind of Entrepreneurial Opportunity

The most interesting pattern to emerge from this literature review is that at some point, at least one scholar from each ontological camp came to the conclusion that the field needs to make distinctions among types of opportunities in order for further discussions to be productive. Readers interested in each position's line of argument leading to this conclusion are referred to the literature cited above. What is more fascinating and far more useful is the fact that a similar conclusion was reached.

One approach distinguishes between opportunities based on scale. Yu (2001) recommends differentiating between what he calls ordinary opportunities and extraordinary opportunities. Ordinary opportunities reflect restructuring the existing way of doing things (cf. causal chain or existing means—ends framework) so that the process is cheaper, better, and/or faster; the determining feature is that the entrepreneur works within the existing situation (p. 56). Extraordinary opportunities, on the other hand, are on the order of Schumpeter's creative destruction. Their identifying feature is that the entrepreneur is trying to make sense out of the uncertainties associated with anomalies and such; nothing like the new product or service idea has ever been seen before and the entrepreneur will probably have a hard time convincing others of its possibilities. Shane (2004) echoes the need to distinguish between the small-scale opportunities (which he calls Kirznerian) and the larger ones (which he also calls Schumpeterian). From a cognitive perspective, the recommendation has face validity because it would seem logical that the cognitive processes associated with each would differ somewhat and that these differences would be important differences.

Other scholars (Endres and Woods 2007) urge that a distinction be made between existing opportunities and newly created opportunities precisely because the cognitive processes associated with accomplishing each is assumed to differ. Recall that there is evidence to support this assumption; the previous section reviewed studies which indicate that the way in which a problem was framed and an individual's store-specific human capital had an influence on an opportunity's degree of innovation.

Plummer et al. (2007) offer several examples distinguishing between ideas for products and services that almost everyone would agree are new to the world versus those ideas that really are instances of an underexploited or incompletely exploited opportunities (p. 374). However, the authors offer an even more interesting idea that an *opportu-*

tunity be thought of in terms of its life cycle where it moves over time from pure novelty to underexploited to exploited to saturated. Thinking in terms of a life cycle is consistent with the theory of evolutionary economics (Buenstorf 2007; Companys and McMullen 2007) which reminds us that the actions of entrepreneurs spawn additional opportunities both mundane and grand. Buenstorf observes that a complete explanation of entrepreneurial opportunities would have to account for those cases in which the entrepreneur only knows that he or she has found the opportunity to create an opportunity which is probably about as abstract a problem frame as one can have (Ward 2004).

It would appear that between consideration of the ontological nature of entrepreneurial opportunities and consideration of the influence of human capital, the *pressure is mounting to include measures that distinguish among types of opportunities*. While the concept of an opportunity's life cycle is probably more useful to theoretical development, measures for it need to be developed and validated. Meanwhile, measures regarding level of innovation already exist and increased deployment of these measures may provide data for a speedier and better measure of opportunity life cycle.

The second direction emerging from the debate regarding the ontological nature of entrepreneurial opportunities is pressure to re-introduce social variables into the discussion of the opportunity identification process. But interest in the social dimension is not limited to this debate, it represents the third major trend of the past 8 years.

21.4 Trend #3: Re-Emphasis of Social Dimensions

As noted earlier the mental models that represent market environments are developed over time through a variety of interactions with other market actors—through learning, buying, selling, working, scanning, and so forth. Therefore, while the concept of mental models is primarily an individual level phenomenon, it is also a social phenomenon because its creation requires social interaction.

21.4.1 Structuration Theory

Giddens (1984) theory of structuration provides a comprehensive description at a meta-level of how the world comes to be represented in an individual's mind and how the individual can take action and even change the world. Central to this description is the concept of scripts (mental models) which summarize and represent an individual's understanding of what works and what does not work based on the feedback an individual receives from social interactions.

Chiasson and Saunders (2005) and Sarason et al. (2006a) provide detailed examples demonstrating that the entrepreneurial opportunity process can be recast in structuration terms but the contribution of these efforts is uncertain and yet to be realized. Both articles point to the need to understand the contents of an entrepreneur's script because the contents codify what the entrepreneur believes to be effective, legitimate, and powerful. Sarason et al. (2006a) also state that the entrepreneur's idiosyncratic

selection of the facts is the driving force of the process; this is analogous to cognitive psychology's presupposition that what one chooses to attend to or ignore drives all cognitive processes. The authors also contend that structuration underscores the importance of signification structures which facilitate the construction of meaning but this line of reasoning needs more development before it can be a useful guide to research efforts. Currently, scholars who are interested in the social dimensions of the opportunity identification process continue to demonstrate the influence of the environment of a geographic location and the influence of social networks.

21.4.2 Environmental Munificence

Kirzner (1979) claimed that the very exercise of entrepreneurial alertness depends on the type of society within which the entrepreneur lives and acts. If the entrepreneur does not perceive incentives, he or she will not engage his or her alertness skills. Tang (2008b) provides some empirical support for this claim; she found that individuals are more likely to engage their alertness abilities as well as commit to starting a business if they perceive their social environment to be munificent, that is, abundant with the necessary resources and social support.

From the cognitive perspective, information is a resource, so one would expect that entrepreneurs would prefer environments rich in information. The uneven clustering of entrepreneurial activity geographically in places like Silicon Valley, Route 123, and so on suggests this to be the case. Cooper and Park (2008) document the fact that entrepreneurs move to these clusters in order to take advantage of the tacit knowledge and informal information flows as well as to add to the knowledge flow themselves. Audrestsch and Keilbach (2007) suggest that the knowledge spillover caused by unexploited or underexploited opportunities is also part of the attraction. This explanation is consistent with the evolutionary economics perspective (Buenstorf 2007; Casson and Wadeson 2007).

The most striking fact about the existence of these clusters is that they are concrete examples of information asymmetries, which according to both the search and discovery approaches conveys considerable advantage for opportunity identification. Recent research (Minniti 2004) shows that alert entrepreneurs are less interested in starting businesses when information is evenly distributed than when there is an unbalance in information distribution (in their favor of course). The other advantage regional clusters have is the existence of and access to entrepreneurial role models, which research demonstrates is most predictive of perceptions regarding environmental munificence (Arenius and Minniti 2005; Tang 2008b) even today after decades of media blitzes.

The power of role models as a predictor of perceptions emphasizes *the need to move beyond assertions regarding the importance of social environments to investigation of what really matters*. The increasing role of the Internet and other forms of telecommunication and video communication points to the probable diminishing importance of geography per se (connect the dots: the rise in concerns about global warming; the cost of travel; the expanding bandwidth; cell phone cameras). It would be useful to know more what factors lay behind the proxy variable called geographic clusters had.

21.4.3 *Social Networks*

Entrepreneurship scholars have long maintained that an entrepreneur's social network is an important source of information as well as an important influence on the way an entrepreneur thinks. It is commonly believed that for entrepreneurs, a network of weak ties is more useful for the identification/creation and pursuit of opportunities (Granovetter 1982). Social construction and structuration theories emphasize the give and take interaction between entrepreneurs and stakeholders in ways that would both facilitate and constrain the opportunity identification process.

The empirical record of the past 8 years is disappointing in that it offers little to deepen or expand our understanding of the role of social networks in the opportunity identification process; however, the role of networks in opportunity exploitation is better understood. We have evidence that entrepreneurs believe that their social networks are very important to the development of their opportunities (Ko and Butler 2007; Thorpe et al. 2006) but we do not have any insights into what these networks actually do for the entrepreneur, whether all networks and network members contribute equally, and whether or when entrepreneurs' interactions with networks create problems. Arenius and DeClercq (2005) claim to offer evidence in support of the power of weak ties but the measure was so indirect (rural versus city living) that it would be misleading to draw conclusions from this study about an individual's network, which has a stronger focal point.

It is time to begin asking more sophisticated questions such as whether and how social networks influence the content of entrepreneurial mental models and whether and how they influence the kinds of connections made within those mental models. The role of mentors in shaping the content of an entrepreneur's mental model would be an excellent place to start. The rise of the cleantech industry also affords the opportunity to examine how mental models are formed by all stakeholders and how they influence each other—this situation is most exciting as it is virtually a clean slate.

21.5 **Trend #4: Widening Schism in Definitions of Entrepreneurial Opportunities**

The single most striking impression one gains from a review of the opportunity identification literature of the past 8 years is that there is an elephant in the room and no one wants to talk about it. Perhaps no one recognizes it? The elephant is the widening gap between the theoretical and empirical definitions of entrepreneurial opportunities. An examination of the literature published since Shane and Venkataraman's declaration reveals three basic conceptualizations of entrepreneurial opportunities:

- (1) introducing new to the world raw materials, goods, services, or processes (Ardichvili et al. 2003; Baron 2006; Companys and McMullen 2007; Eckhardt and Shane 2003; Gaglio and Katz 2001; Sarasvathy et al. 2003; Yu 2001)

- (2) starting a business (Arenius and Minniti 2005; Arenius and DeClercq 2005; Baker and Nelson 2005; Baron and Ensley 2006; Berglund 2007; Fletcher 2006; Sanz-Velasco 2006; Sarason et al. 2006b; Tang et al. 2008)
- (3) introducing new to the world goods, services, or processes by starting a business (Ardichvili et al. 2003; Lee and Venkataraman 2006).

Two dimensions are implicit in these definitions: (1) the scale of the product, service, or process (i.e., new to the world or not) and (2) organizational form (new business or not). Theoretical work tends to favor a strict constructionist view of Shane and Venkataraman's declaration and discusses opportunity in terms of new to the world goods and services. Empirical work tends to favor new venture creation, partly because new venture founders can be considered an "ideal type" of entrepreneur who just happens to be easier to locate when constructing a sample and partly because of the wider use of data sets such as the PSED and Global Entrepreneurship Monitor.

The implications regarding the scale of the product or service have been discussed earlier and will not be repeated here. The question is whether the de facto use of new ventures in empirical work presents serious repercussions, particularly for the discipline's desire to move away from being an applied research setting. If the current pattern is maintained going forward, the discipline will define itself as the study of an organizational form, new ventures, and the task will be to demonstrate that the issues confronting new ventures are unique and their solutions are equally unique.

If the discipline would prefer to avoid this outcome, then journal editors need to encourage more studies about opportunities for new goods and services in the corporate and non-profit settings. Brown et al. (2001) reported some curious findings in their attempt to operationalize Stevenson's (Stevenson and Jarillo 1990) theory of entrepreneurial firms. Their sample consisted of established firms and while their factor analysis confirmed many of the expected dimensions such as resource orientation, reward structure, and growth orientation, it is somewhat puzzling that the factor analysis was unable to support both the strategic orientation and an opportunity orientation; they found the opportunity orientation was subsumed in the strategic orientation scale. This study needs to be replicated before one can draw definite inferences but it would be an extremely important theoretical development if opportunity identification or the kind of opportunity identified were bounded by the organizational form. Articles comparing and contrasting the same opportunity across settings can help sort this out. It is food for thought.

21.6 People: The Game's Afoot!

Table 21.1 summarizes the key findings and insights culled from this review of the work of the past 8 years. As we sit here discussing the implications of these findings and develop our recommendations for building upon these insights while trying to find ways to make the same old platitudes about research designs and methods sound more compelling (or at least fresh), we keep coming back to fact that right now, a rare and unusual set of circumstances exist and we have the feeling that perhaps complying

Table 21.1 Summary of key findings and insights

<ul style="list-style-type: none"> • We have evidence that people scan their environments <ul style="list-style-type: none"> ◦ Both deliberate search and effortless discovery are viable explanations. Which, when? ◦ Amount of scanning depends first upon ease of access to information and then upon degree of perceived turbulence in relevant environment ◦ Motivation for search does not seem to have an impact on long-term success
<ul style="list-style-type: none"> • Knowledge matters, in order to discover or create opportunities, entrepreneurs have to know something <ul style="list-style-type: none"> ◦ The greater the amount of knowledge, the more higher the number of opportunities reported ◦ Degree of specific knowledge, particularly knowledge about customer problems, influences the degree of innovation in reported opportunities ◦ Need to distinguish among different types of opportunities ◦ Decisions to exploit opportunities are mediated by the kind of specific knowledge an individual has and the interaction of an individual's learning style and the situational demands ◦ Serial and novice entrepreneurs appear to have different mental models about what constitutes an opportunity ◦ Novice entrepreneurs and venture capitalists appear to have similar models about what constitutes an opportunity but give different weights to the factors ◦ If knowledge matters, IQ must play a role
<ul style="list-style-type: none"> • Entrepreneurs have some awareness of how they use their mental models <ul style="list-style-type: none"> ◦ Reported awareness of attempts to connect the dots among information acquired ◦ Awareness that their mental models may be incorrect or incomplete, open to the possibility of surprise and change
<ul style="list-style-type: none"> ■ Steps to guarding against framing effects ■ Steps to guarding against functional fixedness <ul style="list-style-type: none"> ◦ Conscious and intentional recombination of inputs, reordering of sequences (counterfactual thinking)
<ul style="list-style-type: none"> • Social environment matters <ul style="list-style-type: none"> ◦ Environments with asymmetric information advantage foster entrepreneurial activity ◦ Geographic clusters experience knowledge spillovers which result in unexploited or underexploited opportunities which attract entrepreneurial activity ◦ The presence of and access to entrepreneurial role models is the most powerful predictor of perceptions of environmental support
<ul style="list-style-type: none"> • Emerging consensus that discipline needs to distinguish among types of opportunities <ul style="list-style-type: none"> ◦ Scale of innovation ◦ Stage in opportunity's life cycle
<ul style="list-style-type: none"> • Schism in the definition of entrepreneurial opportunities <ul style="list-style-type: none"> ◦ Theoretical work tends to define entrepreneurial opportunities in terms of future goods and services ◦ Empirical work tends to define entrepreneurial opportunities in terms of new ventures ◦ Is entrepreneurship becoming the study of an organizational form?

with the traditional format of summary and next steps creates a discussion analogous to a debate about the number of angels that can dance on the head of a pin rather than pointing to the opportunity afforded by the rare events—the game's afoot!

We are going to take the chance and assume that our colleagues in entrepreneurship would prefer not to miss out. We are, of course, referring to the complete meltdown of the global financial markets, which theoretically can be seen as a moment of creative destruction—no one ever said it would look pretty. In addition, a new industry, cleantech, is emerging in response to the global warming crises. In each case, the existing means—ends frameworks are broken; new ones must be created which will give rise to new products and services that will compete in the marketplace. Opportunity identification and creation must occur; a significant amount of opportunity identification must occur.

These circumstances provide at least two avenues of investigation that can dramatically advance our understanding of the opportunity identification process. The first route is to take each of the perspectives outlined in this chapter (search versus discovery; general versus specific knowledge; objective versus subjective versus enacted; weak versus strong ties; and so on) and pit each explanation against the data emerging in either (or both) industry. This is the moment for adherents of structuration theory to make *predictions* about how industry structures, rules, and norms will unfold. The nature of events in these industries allows us to test competing explanations and determine which provides a more useful, more internally consistent, more elegant explanation of the data.

The second avenue is to conduct *good* longitudinal grounded theory studies regarding the development of the mental models, especially their content and change over time. Cognitive maps from each stakeholder group, perhaps even key members of an entrepreneur's network, would prove especially useful as a tracking tool. Content analysis of think-aloud protocols in which entrepreneurs and other stakeholders explain their understanding of events as well as their opinions about where the industry is heading should facilitate identification of pattern recognition and/or counterfactual thinking, bricolage, and so forth. One of the most exciting aspects of current circumstances is that some of these ideas and opportunities are bound to fail so that we can finally start to examine the effectiveness of the various cognitive strategies used. Obviously, the work on mental models can be ramped up to the development of shared understanding, and then to the development of industry standards and norms.

This is the most exciting time for any scholar interested in the opportunity identification process. We have good tools and theories to use but we also need to be entrepreneurial enough to rigorously test these in the marketplace. Why should our respondents have all the fun? This is the time, seize the opportunity.

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Chapter 22

Entrepreneurial Alertness and Opportunity Identification 3.0: Yes, We *Can* Talk Empirical!

C.M. Gaglio and Susan Winter

22.1 Introduction

In 2009, we closed our literature review about entrepreneurial opportunity identification with a call to the discipline that “the game’s afoot!”¹ It was clearly evident that the global market process had entered a period of creative destruction with financial markets experiencing meltdowns at the same time that new industries such as cleantech were emerging. These are moments in time that most social scientists dream of: naturally occurring phenomena that allow science to pit competing theories against each other to assess which, if any, provides the most *useful* explanation of the phenomena. In particular,

- we challenged the structurationists to make predictions about how the cleantech industry would organize itself and then, carefully and thoroughly chronicle what unfolded;
- we challenged the advocates of social cognition theory to conduct longitudinal studies about the *development* of the mental models and decision processes entrepreneurs used to make sense of the emerging cleantech sector and the opportunities they perceived it did or did not present;
- we challenged the social network theorists to conduct longitudinal studies regarding the networking behaviors of the entrepreneurs who introduced new products, services, processes, and business models in the emerging cleantech industry.

¹Gaglio and Winter (2009) page 320.

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Frankly, it wouldn't really matter if it turned out that none of these theoretical approaches to entrepreneurial alertness and opportunity identification proved useful because, regardless of the outcome, we would learn so much in the process of systematic empirical observation and testing.

Now, as we prepared to conduct a literature review for 2009–2015, it turns out we *severely underpredicted* the scope of creative destruction that caught our attention in 2008. The dot.com bust of the 1990s morphed into the Internet of Things where, as the advances in digital technology invade every industrial sector, industries such as entertainment, newspapers, and books were destroyed and recreated at incredible speeds. Social media emerged virtually overnight and became a central part of our lives. For good and bad, the rationalization of digital technology has only begun (McAfee 2012).

Social justice critics will note that the financial meltdown has not changed the behavior of the big banks (MCK 2012; Reich 2015; Taibb 2013) but they—and the banks—may be missing the point: crowdfunding is now a popular alternative to financial institutions for the start-up and growth phases of many businesses (Mollick 2014; Schwienbacher and Larralde 2012); millions of people no longer buy houses, cars, or other big ticket items but choose to participate in the sharing economy (Geron 2013). Alternatives to money such as bitcoin and the imaginative, resourceful uses of prepaid mobile telephone cards (Holmes 2015) are changing the very idea and meaning of money.

The dawn of the twenty-first century provided a plethora of entrepreneurship and entrepreneurial opportunity (no matter how defined) and effectively negated MacMillan and Katz's (1992) concerns that 'the idiosyncratic milieus of entrepreneurship' rendered genuine entrepreneurial events so hard to find that the discipline would never be able to conduct the traditional kinds of studies favored by mainstream business scholars and journals. In fact, the magnitude of current entrepreneurial efforts, creatively destructive or otherwise, is undeniable and remarkable visible. Furthermore, this generation of entrepreneurs appears to adore having everything, however slight, publicly chronicled. Consequently, we have well documented, easily available examples of successes and, more importantly, failures to study.

This tidal wave of creative destruction and entrepreneurship is so evident that scholars in the field of Economics acknowledge the need to take on its elephant in the room: undeniably, disequilibrium has and is occurring. How can that be? The laws of supply and demand, price theory, utility theory, or even invoking the invisible hand do not provide satisfactory accounts of events. Hence, as Manne (2014) notes, the discipline is "resurrecting the ghostly entrepreneur" and attempts are being made to revise neoclassical economic theory to include the entrepreneur (Casson and Wadeson 2007; Minniti and Lévesque 2008). Schumpeter's works are being reexamined (Betta et al. 2010; Braunerhjelm and Svensson 2010; Endres and Woods 2010; Gerschlager 2012). Kirzner (2009) came out of retirement to address what he considered misperceptions among some of his newfound admirers.

One of the more fascinating proposals to surface in this discussion is to consider *ideas a new factor of production*, joining land, labor and capital (Manne 2014). In this context, entrepreneurs are the market actors who instigate the valuable claims to the intellectual property rights accruing from ideas.

Clearly, Economics is wrestling with the impact of real-world events on its theories. Economists who specialize in the role of the entrepreneur as a market actor are being recognized for their previously marginalized contributions. Kirzner's and Baumol's work were proposed for Nobel Prize consideration in 2014 and it was rumored that they had made the short list (Carden 2014).

Yes, certainly the game was afoot in 2008 and is so now! So, how did the scholarly study of entrepreneurial opportunity identification fare? A reading of the academic literature gives the impression that, with a few exceptions, most discipline scholars did not deeply engage these enormous recent social and economic transformations. Later in this chapter, we highlight two exceptional studies regarding the cleantech industry, but the many other instances of emerging industries have gone relatively unexamined.

The trends noted in our previous literature review about entrepreneurial alertness and opportunity identification continued with a few new variables added to the mix. *However, several extremely important steps were taken* that advance the empirical study of entrepreneurial alertness and opportunity identification. Our goal in this chapter is to highlight those works and examine the conceptualizations, approaches, and research practices that best advance the study of entrepreneurial alertness and opportunity identification. Accordingly, this is a selective rather than comprehensive literature review.²

We begin by briefly updating the trends that continued from our previous review (Table 22.1) and note the new variables that have emerged as part of those discussions. We then discuss some fundamental issues about the empirical investigation of alertness and entrepreneurial opportunities that have unnecessarily absorbed scholarly attention: (1) entrepreneurial opportunities are indeed empirical and *part of the social fact*³ that is the economic marketplace; (2) because entrepreneurial opportunities are part of the economic marketplace, they are social phenomena; (3) social facts and phenomena are frequently claimed for political as well as scholarly agendas. Finally, we delve into important recent research advances in opportunity alertness and identification and explore notable exemplars of high quality empirical conceptualizations, methods, and techniques that incorporate the social dimension of the phenomena and yield valuable insights.

22.2 A Quick Update

Under normal circumstances, it would not be especially surprising that the topical trends identified six years ago would still be deemed important today. And one might expect the new work to deepen our understanding of these topics. Table 22.1 summarizes and updates the key findings from our previous review.

²Those desiring comprehensive reviews might consult (Busenitz et al. 2014; Crump et al. 2011; Short et al. 2010; Welter and Alvarez 2015).

³The existence of social facts, their origins, and dynamics were outlined by Emile Durkheim (1938) in *The Rules of Sociological Method*.

Table 22.1 Major trends and key findings summary of key findings 2000–2015

Trend	Previous key findings 2000–2008	New information 2008–2015
<p>Application of cognitive psychology</p>	<p><i>Search effort:</i></p> <ul style="list-style-type: none"> • Both deliberate search and effortless discovery are viable explanations. Which, when? • Amount of scanning depends first on ease of access to information and then upon degree of perceived environmental turbulence. 	<ul style="list-style-type: none"> • Systematic search to find new opportunities <ul style="list-style-type: none"> – Bhagavatula et al. (2010) • Habitual entrepreneurs engage in as much search intensity as novices. Higher levels of information search do lead to identification of more opportunities <ul style="list-style-type: none"> – Westhead et al. (2009) – Dyer et al. (2008)
	<p><i>Mental models—content</i></p> <ul style="list-style-type: none"> • The greater the amount of knowledge, the higher the number of opportunities reported • Degree of specific knowledge, especially about customer problems, influences the degree of innovation • Serial and experienced entrepreneurs appear to have different mental models about what constitutes an opportunity • Novice entrepreneurs and venture capitalists appear to have similar models of what constitutes an opportunity but give different weights to the factors • If knowledge matters, does IQ play a role? • Entrepreneurs report awareness of attempts to connect the dots among information acquired • Entrepreneurs report awareness of their mental models which may be incorrect or incomplete, open to the possibility of surprise and change • Conscious and intentional recombination of inputs, reordering of sequences (counterfactual thinking) 	<ul style="list-style-type: none"> • Women's human capital (knowledge) appears to hinder opportunity identification compared to men <ul style="list-style-type: none"> – Gonzalez-Alvarez and Rodriguez (2011) • However, deficiency in women can be compensated for by priming <ul style="list-style-type: none"> – Arentz et al. (2013) • Experienced business owners identify more opportunities and more innovative opportunities than less experienced business owners up to a point after which business ownership experience becomes more of a liability than an asset <ul style="list-style-type: none"> – Bhagavatula et al. (2010) – Gaimon and Bailey (2013) – Ucbasaran et al. (2009) – Respondent descriptions about opportunities were data driven not driven by cognitive structures or prototype schemas or template matching – Gartner et al. (2008) – Gregoire et al. (2010)

- Respondents align both superficial features of a product or service and the structural relationship it may have with markets and other offerings
 - However, attention to superficial features represents a small portion of cognitive effort displayed and appears to trigger the search for relational combinations
 - In addition, higher level of prior knowledge appear to be associated with aligning structural relationships
 - Grégoire et al. (2010)
- Perhaps we should pay more attention to how information is interpreted
 - Barreto (2012)
 - Tumasjan and Braun (2012)
- Whether an individual interprets uncertainty as a state, effect or response uncertainty seems to matter for sense-making. People believed to be less tolerant of response uncertainty
 - McKelvie et al. (2011)
- We need to start making distinctions between the opportunity idea, the opportunity belief, the opportunity intention
 - Grégoire et al. (2010)
 - Haynie et al. (2009)
- Respondents make a distinction between opportunities for someone and opportunities for themselves. Theory refers to this distinction as third person v. first person opportunities
 - Buenstorf (2007)
 - Dimov (2007)
 - Hui-Chen et al. (2014)
 - McMullen and Shepherd (2006)
- Alertness is a unique schema that allows individuals to impute meaning to changes
 - Directing attention is foremost
 - Schema content differs in granularity and the number and kinds of attributes stored
 - Valliere (2013)

(continued)

Table 22.1 (continued)

Trend	Previous key findings 2000-2008	New information 2008–2015
<p><i>Mental models—creation and change:</i></p> <ul style="list-style-type: none"> <li>• Entrepreneurs report awareness of attempts to connect the dots among information acquired <li>• Entrepreneurs report awareness of their mental models which may be incorrect or incomplete, open to the possibility of surprise and change <li>• Conscious and intentional recombination of inputs, reordering of sequences (counterfactual thinking) <p>Contemplation of the ontological nature of entrepreneurial opportunities</p>	<ul style="list-style-type: none"> <li>• Affect (emotion) hypothesized as exerting a strong influence on all cognitive processes and may negatively influence perceptions in a rapidly changing environment <ul style="list-style-type: none"> <li>– Baron (2008) <li>– Grichnik et al. (2010) <li>• Need for cognition is a motivator for opportunity identification but it is mediated by entrepreneurial alertness <ul style="list-style-type: none"> <li>– Ko (2012) 	<ul style="list-style-type: none"> <li>• Discovered or Created <ul style="list-style-type: none"> <li>– Alvarez and Barney (2010) <li>– Buenstorf (2007) <li>• Exogenous or endogenous <ul style="list-style-type: none"> <li>– Alvarez et al. (2013) <li>• Distinctions between discovered and created are ex-poste; real issue is initial discernment and its precursors <ul style="list-style-type: none"> <li>– Valliere (2013)

<p>Re-emphasis of social dimensions</p>	<ul style="list-style-type: none"> • Social environment matters • Environments with asymmetric information advantage foster entrepreneurial activity • Geographic clusters experience knowledge spillovers which result in unexploited or under-exploited opportunities which attract entrepreneurial attention • The presence of and access to entrepreneurial role models is the most powerful predictor of environmental support • Role of social networks more clearly visible and understood in the opportunity exploitation phase • Environmental Muni ficence • Structuration Theory 	<ul style="list-style-type: none"> • Physical infrastructure (hygiene factors) not that important a factor in Europe <ul style="list-style-type: none"> – Audretsch et al. (2015) • Changes in regulatory environment or industry structure precipitate increases in new venture creation <ul style="list-style-type: none"> – Gawel and Toikka (2014) – Jiao et al. (2014) • Networks stratified and subgroups used for different purposes <ul style="list-style-type: none"> – Bhagavatula et al. (2010) – Dyer et al. (2008) – Gemmel et al. (2011) • Knowledge acquired from core social network (e.g., suppliers, distributors) significantly affects degree of opportunities innovativeness <ul style="list-style-type: none"> – Jiao et al. (2014) • Importance of shared cognitions developed from a shared history <ul style="list-style-type: none"> – Andresen et al. (2014) – Luska (2008) – Overholm (2015) – Sime and Lee (2009)
<p>Widening schism between theoretical and operational definitions of entrepreneurial opportunity</p>	<ul style="list-style-type: none"> • Theoretical work tends to define entrepreneurial opportunities in terms of future goods and services • Empirical work tends to define entrepreneurial opportunities in terms of new ventures 	<ul style="list-style-type: none"> • While the general pattern found in 2008 continues today, good measures for degree of innovativeness in goods and services exist and they can be added to any study regardless of organizational form <ul style="list-style-type: none"> – Block et al. (2013) – Dahlqvist and Wiklund (2012) • Acknowledgement that opportunity and entrepreneurship are hotly contested concepts

In several instances, some of the empirical results appear to contradict accepted propositions regarding entrepreneurial behavior and cognitive processing. For example,

- habitual, experienced entrepreneurs appear to engage in as much search effort as novices;
- prior knowledge, deemed essential to perceiving and interpreting the environment as well as to developing ideas for new opportunities, appears to be a double-edged sword: it is useful up to a certain point after which it may actually be detrimental in recognizing new information and new opportunities;
- respondent descriptions of their opportunities and analyses of interview transcripts suggest that they are *not* engaging in any template or prototype matching; rather, their efforts appear data driven.

These apparent contradictions illustrate the obvious importance of empirical investigation and theories grounded in empirical evidence. Several new trends have also emerged in the literature demonstrating the value of conceptualizing entrepreneurial opportunities as phenomena that are empirical, social, socio-cognitive, and amenable to innovative methods of research.

22.3 Entrepreneurial Opportunities Are Empirical Phenomena

Not Elusive, Political. Two debates intensified: (1) whether an entrepreneurial opportunity represents an opportunity for innovation or for starting any kind of business, and (2) whether entrepreneurial opportunities are created or discovered. With little indication of impending resolution of these ontological arguments, Dimov (2011) bemoans the elusiveness of the construct. We beg to differ; it is not elusive. It is, much like entrepreneurship itself, hotly contested terrain where a number of different communities of interest with differing political agendas demand exclusive ownership of the word and control over its meaning.

For example, stakeholders such as governments, banks, community development organizations, and philanthropic foundations are interested in reducing poverty and enhancing economic development at the individual, regional, and national levels. This community of stakeholders uses the term entrepreneurial opportunity to describe the opportunity to start a business of any size; that is, as a chance to earn money through self-employment with hopes of stability and perhaps even some growth (Aubry et al. 2015; Audretsch et al. 2015; Aziz et al. 2013; Cullen et al. 2014; Deli 2011; McMullen et al. 2008; Singh and Gibbs 2013; Turkina and Thai 2015).

Venture capitalists, however, are interested in significant returns on their investments. Innovations that have clear, traceable, and proprietary lines of value creation best fit this set of needs (Barringer and Ireland 2009; Meyer and Crane 2014). Consequently, they think of entrepreneurial opportunity in terms of new ventures (clear, traceable, propriety) introducing lines of value creation (innovative products, services, processes) with high growth potential (significant returns on investment).

Business schools represent one of the primary battlegrounds in the contest over definition and meaning. By their nature, business schools are institutions devoted to the study of large established firms and find the definition of an entrepreneurial opportunity as innovation through corporate entrepreneurship consistent with that nature. However, business schools with “entrepreneurship” programs offer classes in small business management, new venture creation, and family business succession. The presence of these curricula suggest entrepreneurial opportunity be defined as self-employment, firm emergence, and wealth creation, respectively (Eckhardt et al. 2014; Huning et al. 2012; Jones and Holt 2008; Lim et al. 2013a; Niammuad et al. 2014; Shepherd and Patzelt 2013). And, depending on the strength of the engineering school on campus, entrepreneurial opportunity may be viewed as the chance to start a high-tech business.

The term entrepreneurship is so attractive that it has even been adapted into a field that encompasses many activities and multiple organizational forms pursuing positive social impact; that is, social entrepreneurship (Martin and Osberg 2007).

With so many different stakeholders seeking to control the vocabulary of innovation, opportunity and entrepreneurship, multiple and often incompatible definitions proliferate. What is frequently overlooked in the heat of passion these contests engender is the fact that the *origins of the concept ‘entrepreneur’ are in the field of Economics*. Entrepreneur is simply a role (albeit frequently invisible) in the economic marketplace; a place that also includes owners, managers, customers, employees, and so forth. Therefore, entrepreneurial opportunities represent the vehicles through which an entrepreneur (individual, team or firm) engages in the entrepreneurial role. Currently, the role is thought of either in terms of correcting the errors of other market actors (Kirzner) and/or introducing innovative ideas (Schumpeter). The crux of entrepreneurship lay in the marketplace of innovative ideas where alertness and opportunity identification initiate role enactment. The focus of our review hereafter is on the role of entrepreneurial alertness and opportunity identification in the marketplace of ideas.

22.4 Alertness and Entrepreneurial Opportunities Are Social Phenomena

There is an unfortunate tendency in the entrepreneurship discipline to reify the phenomena of interest and literally turn them into objects of attention (Klein and Bylund 2014). Social facts and social phenomena are not concrete items that can be picked up and handled. In the field of entrepreneurship, they are symbolic representations of a dynamic market process. While a snapshot of the language, symbols, and other artifacts of a website or a contract or a deal, etc., can be taken, any analysis of this phenomenon that does not incorporate its process dimension can easily go astray.

While social facts are not concrete, they are nonetheless very real and create important constraints that help and hinder the creation or identification of entrepre-

neurial opportunities. And it is possible to capture that process empirically. For example, the works of Overholm, Sine and Lee, and Luksha bring evidence to bear on the importance of creating shared meaning whether initiated by the entrepreneur or other market actors.

Overholm's (2015) careful study of the development of the solar services market illustrates the dynamic influence market actors have on each other as they create the boundaries of that market space. He delineates a set of complex and evolving relationships among venture creators and the other market actors such as financial institutions, manufacturers, installers, insurers, utilities, regulators, government, and followers. His analysis highlights the importance of shared language that may start with an entrepreneur's communication of new beliefs and ideas through framing, educating, and socializing the other market actors. The development of a shared language and understanding continues through the creation of processes for interacting (e.g., what a contract for solar services should look like; what a financing structure for solar loans would look like, etc.) that are developed as much by the other market actors as by the entrepreneur. Overholm notes that most subsequent new venture founders in solar services considered these social phenomena to be 'rules of the game'; rules to be followed carefully, not just imitated. These founders might try new business models for their ventures but they were careful to speak the language and follow the processes that were understood by the other market actors.

Sine and Lee (2009) examine the wind power sector of the clean tech industry and illustrate how other market actors such as large social movements can produce a shock to the marketplace and create the disequilibrium shaping alertness and entrepreneurial opportunities. We think their study does much more by documenting the process of creating the social facts (the shared language, values, and norms) that all other market actors then leveraged.

The authors recount how social movement organizations worked together to frame the language for environmental problems when talking to non-environmentalist market actors. These efforts did not result in creating the desired sense of urgency for solving environmental problems. However, the influence of these groups and their influence process in creating the norms and values that proposed solutions should follow is clearly evident. In addition, they pressured governments and other funding organizations to finance work on product/process solutions and thereby create the industry space in the marketplace and educated entrepreneurs about the opportunities. Sine and Lee's description of how these organizations mobilized their membership networks illustrate the importance of political and interest group legitimacy for entrepreneurs working in this industrial sector. Their account includes some instances of ineffective use of these resources, which raises more sophisticated questions for opportunity identification researchers to examine.

Luksha (2008) presents a conceptual framework that emphasizes the role of structured communication in establishing social constructs such as issues and framings; he then links the creation of these constructs to the creation of niches in the marketplace and ultimately, to creating entrepreneurial opportunities in the marketplace.

Unlike those who merely assert that the social context of entrepreneurship must be taken into account (Baker et al. 2005; Dimov 2007a; Korsgaard 2011; Mole and Mole

2010), these empirical case studies *demonstrate* its importance and raise additional important questions about how context is shaped. The evidence these studies provide is of considerable practical and theoretical value. While neither study represents a full account of the emerging market phenomena, no single piece of research ever can. However, multiple quality studies such as these serve to triangulate on the salient dimensions and their interactions and contribute to the science conversation through empirical evidence—which is the best way for this conversation to move forward.

Another area in which the social quality of alertness and entrepreneurial opportunities is evident and important is networks. In 2008, we identified social networks as a potentially fruitful area of opportunity identification research and recent research has made significant steps in developing our understanding of these dynamics. For example, it is nearly axiomatic within the discipline that weak ties have more value for entrepreneurs because of the access to various resources (Aldrich and Zimmer 1986; Granovetter 1973). Bhagavatula et al.'s (2010) case study of the handloom industry in India confirms that an entrepreneur's weak ties were essential for identifying opportunities but those ties were less useful for other kinds of resources. Strong ties provided access to requisite resources for implementing opportunities. In hindsight, this sounds obvious. Implementation resources usually involve money and an entrepreneur is more likely to be able to obtain money from a strong tie. However, before we can comfortably conclude what weak ties versus strong ties do for entrepreneurs, we need to validate these findings in less capital-intensive industries and perhaps in other cultural settings. Nevertheless, the study provides visibility about the dynamics and process of social networks in entrepreneurship.

Another study that lifts the veil on network dynamics was done by Gemmill et al. (2012). They found the entrepreneurs stratify their network members: the trusted partners, the inner group, the close outer group, and the outer group. An entrepreneur will use each of these to identify and refine innovative ideas but the trusted partner is the first confidant. Of greater interest is the finding that entrepreneurs engage in a process of social and conceptual experimentation (a form of counterfactual thinking) with their inner group to identify opportunities.

22.5 Entrepreneurial Opportunity Is a Socio-cognitive Phenomenon

The dynamics of the economic marketplace is driven by human agency (Gerschlager 2012; Kirzner 2009). Therefore, the question of what an individual market actor, particularly the entrepreneur, perceives, interprets, and believes about the social fact of the marketplace will always be an important question for both Economics and Entrepreneurship.

In our last review, we noted the discipline's interest in how those perceptions, interpretations, and beliefs were stored within an individual (mental models or schema) and that the knowledge contained within various schema definitely played

some role in opportunity identification. For cognitive psychologists, it is axiomatic that these cognitive processes and products are social as well as individual.

The dual nature of mental models and their influence on entrepreneurial alertness and opportunity identification is illustrated in a novel historical analysis of John Chapman's (aka Johnny Appleseed) entrepreneurial endeavors in settling the American frontier (Skarbek 2009). Based on historical records and a documented biography of Chapman, Skarbek reconstructs the likely mental model of Chapman's world, which, the author observes, contained many ambiguities and uncertainties associated with the frontier. Records indicate that formal institutions like courts and local governments were rarely present; in that vacuum a marketplace of informal rules (norms) emerged which settlers followed. One of these norms, respected by federal government, was that the person who improved the land had stronger claim to it. What constituted land improvements seemed open to considerable interpretation.

Chapman's insight, based on his specific knowledge of the local norms and cross connected to his nature-based religious beliefs, was that planting a number of apple trees on a property would probably be accepted as land improvement. Settlers began to accept and use this interpretation of the norm and the norm was eventually upheld by more formal rules like court decisions. Chapman paid attention to migration routes and made sure he had apple tree plantings available for sale to settlers as the frontier moved further out. He used the norm he helped established to increase wealth for himself, the land and the settlers.

Skarbek's study illustrates how situated awareness and mental models⁴ can be used to develop advantages and opportunities for the entrepreneur. A study by Dyer et al. (2008) illustrates how some mental models (e.g., the status quo) might be targets for destruction themselves. The authors interviewed 28 entrepreneurs who are generally acknowledged as innovators (e.g., Michael Dell, Jeff Bezos, Scott Cook, David Neeleman, Pierre Omidyar and Niklas Zennstrom) and their close associates in order to learn more about the cognitive processes these entrepreneurs articulate that lead to innovations. One theme that emerged from both sets of interviews was the crucial role played by a deeply held desire to change the status quo (a mental model). For many of these entrepreneurs the desire sounded more like an obsession (chronic schema). This desire leads to questioning, observing, and mental experiments (counterfactual thinking). Similar to the results reported by Gemmill et al. (2012), the entrepreneurs and their associates report that the entrepreneurs then engage in idea networking, a practice of running their counterfactuals with members of their social network to refine and develop their insights.

The ability to use a mental model or to blow it up requires that much of its content is socially shared. It appears that either avenue (constructive or destructive) can lead to opportunity identification.

These studies are examples of the interaction between the person and the situation that represents the core assumption of the socio-cognitive approach. However, the studies do not provide any satisfactory explanation of what cognitive processes the individual uses for processing and interpreting situations.

⁴Mental models are an example of a social fact.

Dimov (2007b) provides an excellent example of research that can explore those processes. He created an experiment to examine the impact of learning style (e.g., convergent, divergent) and the domain-specific knowledge (mental model) on opportunity identification. The results indicate that domain-specific knowledge is brought to bear *after* an individual feels comfortable that he/she understands the situation, mainly because it matches the individual's learning style. The subsequent inclusion of domain-specific knowledge increases the likelihood of opportunity identification.

One of the more interesting aspects of Dimov's experiment was the inclusion of a scale asking respondents to rate the likelihood of taking different steps to investigate the opportunity they reported. As may be expected, a person was more likely to report a willingness to take additional investigative steps when his or her domain specific knowledge was well developed. Of equal interest is that not all the entrepreneurially inclined respondents reported a high likelihood to investigate their ideas. These results can be seen as support of Haynie et al.'s (2009) distinction between third-person and first-person opportunities. The results do clearly indicate a difference between opportunity identification or insight and opportunity exploitation. Dimov proposes an intermediary step, opportunity intention, which can be measured by the scale created for the experiment. His suggestion moves the study of entrepreneurial opportunity toward a more process orientation.

However, Arentz et al.'s (2013) experiment must be viewed as a caution against assigning too much weight to role of prior knowledge. The authors created an experiment in which half their sample was given special information in order to prime them to see a 'hidden in plain sight' opportunity for arbitrage. The other half of the sample did not receive any special information. As predicted, significantly more respondents in the primed condition reported the arbitrage opportunity than those in the non-primed condition. However, the *real* finding is that more than half of the respondents in the primed condition did not find the arbitrage opportunity while nearly 20% in the non-primed condition did! These data suggest that prior knowledge is useful, perhaps necessary, but it is not sufficient to explain opportunity identification. The results can also be seen as empirical confirmation of alertness or something like it.

22.6 Methodological Advances in Entrepreneurial Opportunity Identification Research

Perhaps the most exciting developments in entrepreneurship research since our previous review are the increased diversity of research techniques and increased number of studies using sophisticated data sources, research designs, and analytical tools. Though not necessarily focused on opportunity alertness and identification, a number of published studies provide particularly good methodological exemplars that can guide future research efforts in our own area. The methods used are described clearly and in sufficient detail to allow research reproducibility and application to other areas.

Entrepreneurship is rapidly becoming a data rich discipline, the result of an explosion of publicly available research data. Contemporary accounts or representations produced through the integration of information technology into everyday life has resulted in a huge volume of electronic communications and information. New ventures and their founders generate internal and external communications that are born digital and preserved in their original form such as archived websites, email, and tweets. These rich data sources can augment retrospective accounts and now enable the empirical study of alertness and opportunity identification processes and outcomes.

In addition, historical records formerly accessible only to those who traveled to an archive are increasingly being digitized and made widely accessible and thus more amenable to analysis. Forbes and Kirsch (2011) argue that such records can play a crucial role in understanding industry emergence. Skarbek's (2009) use of historical information to identify the sources of Johnny Appleseed's entrepreneurial success is a case in point.

Improved tools have also been developed for collecting data. For example, hewing closely to the Austrian theory of entrepreneurial opportunity, Dahlqvist and Wiklund (2012) operationalized their definition of the innovativeness of an opportunity by creating and validating a new scale to measure an opportunity's nonequiv- alence and market availability.

Sophisticated research designs such as conjoint analysis have been used to understand how different types of uncertainty affect entrepreneurial action (McKelvie et al. 2011). New analytic tools are also much more widely available. In a comparative case study of entrepreneurial decision-making, Maine et al. (2015) presented a well-documented and replicable coding scheme for analysis of complex longitudinal processes through event tables for integrating data from multiple sources and inductive categorization.

A new trend in research that may be useful in understanding opportunity alertness and identification is a focus on *effect size* rather than statistical significance. Statisticians have long warned that statistical significance is sensitive to sample size and the rise of big data has brought this concern to the fore (Lim et al. 2013b). Chang et al.'s (2014) study of the effectiveness of entrepreneurship MOOCs is a useful example. The study began with 180,000 learners; 705 completed all courses and 268 of these returned usable questionnaires. Imagine a different experimental design that focused on the systems logs of the instrumented courses, which could logically include all 180,000 learners. Such a large sample would greatly increase the probability of statistical significance for even the smallest unimportant differences.

In response, many researchers are recommending that, instead of paying attention to statistical significance alone, more attention be given to the analysis of impact and effect size measures – that is, to measures that assess the magnitude of individual or group change. Arentz et al.'s (2013) study described in the previous section illustrates the usefulness of examining effect size: they found that propitious prior knowledge doubled the percentage of participants who discovered an arbitrage opportunity from 19 to 38%—a difference of considerable practical importance (Table 22.2).

Table 22.2 Emergent areas and key contributions for entrepreneurial opportunity recognition research

Emergent area	Key contribution	References
Opportunities as social phenomena	Mutual influence among market actors in an emerging industry	<ul style="list-style-type: none"> • Luksha (2008) • Overholm (2015) • Sine and Lee (2009)
	How entrepreneurs create their social networks and use them to identify and refine opportunities	<ul style="list-style-type: none"> • Bhagavatula et al. (2010) • Gemmell et al. (2012)
Opportunities as socio-cognitive phenomena	The role of prior knowledge	<ul style="list-style-type: none"> • Arentz et al. (2013) • Dimov (2007b) • Skarbek (2009)
	Entrepreneur's desire to change the status quo	<ul style="list-style-type: none"> • Dyer et al. (2008)
	The social process of opportunity identification through posing questions, exchanging and refining ideas, running counterfactuals with social network	<ul style="list-style-type: none"> • Dyer et al. (2008) • Gemmell et al. (2012)
Methodological exemplars	Archived first person and contemporaneous materials	<ul style="list-style-type: none"> • Forbes and Kirsch (2011) • Skarbek (2009)
	Theoretically grounded operationalization and scales	<ul style="list-style-type: none"> • Dahlgvist and Wiklund (2012)
	Conjoint analysis	<ul style="list-style-type: none"> • McKelvie et al. (2011)
	Coding scheme for integrating data from multiple sources through event tables	<ul style="list-style-type: none"> • Maine et al. (2015)
	Potential for use of big data	<ul style="list-style-type: none"> • Chang et al. (2014)
	Potential use of effect size and impact not statistical significance	<ul style="list-style-type: none"> • Arentz et al. (2013)

22.7 Conclusion and Implications

New research has emerged contradicting earlier propositions and contributing to our understanding of alertness and opportunity identification as empirical processes deeply rooted in social facts and social cognition. Prior knowledge and a propensity to challenge the status quo play an important role in generating and choosing among ideas. However, the opportunity identification process is dependent upon entrepreneurs' complex social networks where they establish shared meaning and engage in complex and evolving relationships with trusted partners and other market actors.

Innovative data sources and research methods as well as clear examples of their use have been developed. Theory-based measures, digital archives of the Internet and of businesses, and conjoint analysis can provide a wealth of valuable data. Analytic tools such as event tables and effect size measures can be leveraged to fulfill the promise of an empirically-based discipline in entrepreneurship.

Struggles to control the vocabulary of entrepreneurship continue but are largely tangential to the scientific conversation about entrepreneurial alertness and opportunity identification. Much has changed since our earlier review resulting in a research landscape that is remarkable for its munificence. Creative destruction has become the hallmark of our time presenting a plethora of research opportunities and encouraging entrepreneurship research to play a central role in economic and business policy.

The game is, indeed, still afoot, *go for it!*

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Chapter 23

Entrepreneurial Behavior: Its Nature, Scope, Recent Research, and Agenda for Future Research

Barbara Bird and Leon Schjoedt

An action is the perfection and publication of thought.

Ralph Waldo Emerson

The end of all the cognition and motivation of entrepreneurs is to take some action in the world, and by doing so, give rise to a venture, an organization. Thoughts, intentions, motivations, learning, intelligence without action does not create economic value. The very nature of organizing is anchored in actions of individuals as they buy, sell, gather and deploy resources, work, etc. The values created by exploiting of opportunity undoubtedly include some that are intrapsychic and personal, but those we study, those of value to the readers of this book, are inherently interpersonal and social and thus observable and learnable. This chapter provides a brief overview of entrepreneurial behavior using a limited but hopefully representative lens on recent research. We call for more research on what entrepreneurs do and that this research be both more rigorous than what we currently have and also more creatively sourced.

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23.1 The Nature and Scope of Entrepreneurial Behavior

Entrepreneurial behavior as an academic interest is the study of human behavior involved in finding and exploiting entrepreneurial behavior opportunity through creating and developing new venture organizations. Entrepreneurial behavior is the proximal outcome of the cognitions and emotions of entrepreneurial actors; it is also the proximal individual-centric cause of venture outcomes. The major goals of research are to explain, predict and control (change and change) behavior of individuals and teams. Knowledge of entrepreneurial behavior has value to actors—entrepreneurs as it allows them to shape and change their behaviors for better outcomes and to venture stakeholders, such as investors, local governments, and employees, insofar as entrepreneurial outcomes meet their respective goals. Knowledge of entrepreneurial behavior is important to educators, students, news media, and creative writers. Entrepreneurial behavior eventually results in the creation of innovations, new competition, new jobs, and new revenue streams, and scholars from several disciplines such as economics, sociology, psychology, social psychology, and organizational design may find interest as well.

Entrepreneurial behavior as a research construct is the concrete enactment of individual or team tasks or activities required to start and grow a new organization. As we will argue, behaviors are best understood as discrete units of action that can be observed by others and which are “sized” to be meaningful. These activities are consciously chosen by individuals with the intention of finding and exploiting an opportunity and forming an organization of human, financial, physical, social, and intellectual resources. Examples of such activities are illustrated in a study by Carter et al. (1996). The resulting organization may be for profit or not, may vary on a continuum of virtuality and size, but it contributes economic and social value to its surroundings (Davidsson et al. 2006; Mitchell et al. 2007). This behavior (these actions) draws upon the experience, knowledge, skills, abilities, cognitions, intelligence, learning, intentions, and motivations of entrepreneurial individuals and teams. Behavior is visible, auditory, and/or kinesthetic and if others are present, social or potentially interpersonal in nature. Thus deciding is a cognitive process invisible to others and is different from the action of writing down the decision, orally communicating the decision, or taking other action to implement the decision. In the same way, learning is a cognitive process and objective assessment of learning results from behaviors.

23.1.1 Differentiating Concepts

First, entrepreneurial behavior is individual behavior, not firm behavior. Thus work on entrepreneurial orientation (Lumpkin et al. 2009; Wiklund and Shepherd 2003) and the operationalization of Stevenson’s dimensions (which items are also attitudinal and ipastive) do not fall into our purview (Brown et al. 2001).

At the individual level of analysis, often researchers and certainly students and laypeople fail to differentiate behavioral terms. Behaviors are actions and therefore also *activities* of individuals (entrepreneurs). *Responses* are behaviors that follow

from and presumably caused or evoked by some preceding stimulus. *Performance* is usually understood as results achieved by an action and when measured is often a complex aggregation of many behaviors (e.g., a high-performing student combines reading, writing, exam-taking, critical thinking, life-management behaviors, and many other behaviors).

Ability is a relatively stable broad characteristic of individuals that underlies their maximum performance and would include various forms of intelligence and physical attributes, such as strength or height. In general, abilities are difficult to change; however, they can be enhanced over time with education and experience. For example, intellectual ability refers to individuals' all-around effectiveness in activities directed by thought, such as thinking, reasoning, and problem solving, and in one approach (Sternberg 1988) has three facets: (1) analytic intelligence (*g*), (2) practical intelligence ("street smarts") which is domain specific, and (3) creative intelligence which is the ability to produce something that is, both, novel and useful. *Skills* are abilities to perform specific tasks and can be either broadly or narrowly construed (e.g., general skill at negotiation or more specific skill at bluffing). *Knowledge* is information the individual has in specific areas (e.g., knowledge about a market or how to make an oral presentation) acquired through education and experience. Knowledge can be either explicit or tacit and general or specific. *Competence* may be defined as abilities, knowledge, skills, traits, and concepts of self such as self-efficacy beliefs that are "causally related to criterion-referenced effective and/or superior performance in a job or situation" (Spencer and Spencer 1993). These capacities (abilities, skills, knowledge, and competencies) enable behaviors but are not behaviors themselves.

Processes may involve behavior but not necessarily. Decision making is a process that is largely cognitive and which leads to a choice among alternatives and may result in some action. Creativity is also a process often largely cognitive, of producing something new or partially new (Amabile 1996). Searching for opportunity is a process that may share elements of cognition, creativity, learning, and behavior (Corbett 2007; Sternberg 2004).

Whereas behavior is observable, performance, capacities, and processes are derived by inference from behaviors. For capacities to result in action, motivation and opportunity must also be present for behavior. For processes to have an impact in adding economic and social value, action or behavior must follow.

23.2 Recent Research on Entrepreneurial Behavior

23.2.1 Conceptual Efforts

In assessing the recent research on entrepreneurial behavior, we reviewed conceptual and theoretical articles that aim squarely at our topic. Action theory advanced by Frese (2007) builds on the cybernetic control model of Miller et al. (1969) and links the chapters which define this book to "action." This model, as well as that

discussed by McMullen and Shepherd (2006), describes the judgmental processes which precede action or behavior and the cognitions which either enable or impede individuals from acting entrepreneurially when faced with an opportunity. Both models define action as consciously chosen (intentional) responses of individuals. While Frese (2007) focuses on behavioral control through planning, feedback, cognitive regulation, and traits of individuals such as initiative, McMullen and Shepherd (2006) focus on how decision uncertainty is perceived and impacts entrepreneurial action (which they leave undefined). Thus both of these efforts discuss action, address precursors to action but offer little insight into the action or behavior itself.

An initial effort to bring the field of organizational behavior to entrepreneurship came in 1989 when the first author (Bird 1989) summarized the then extant research pertaining to entrepreneurial behavior, defining it as “opportunistic, value-driven, value-adding risk-accepting, creative activity where ideas take the form of organizational birth, growth or transformation” (p. 5). The book included chapters on the person-centered variables (i.e., experience, education, motivation, values, and emotions), social and political contexts of entrepreneurial behavior, careers, teams, staffing, governance, leadership, competencies, and learning. Following that, Gartner et al. (1992) had one of the earliest journal articles that attempted to map organizational behavior onto emerging (compared to existing) organizations. They reviewed managerial work as a field of research, hoping for guidance in framing entrepreneurial behavior but found managerial work literature to be as atheoretical as entrepreneurship at the time. They recommended richer description of entrepreneurial behavior. It is interesting to note that this article has been cited only 43 times in the past 10 years and of these only 16 reference the behavior of entrepreneurs. A more recent effort to extend this bridge from organizational behavior to entrepreneurship was forged by Baron (2002). His review addressed the basic OB model (found as a framework in most textbooks) of individual, interpersonal, and organizational/social factors at three phases of the entrepreneurship process (pre-launch, launch, and operations). Much of his contribution here and elsewhere (Baron 2008) anchors on individual cognition and decision making but he has also introduced OB links for some specific person-centric predictors of outcomes that include learning from a mentor, social competence, successful and emotional intelligence, charismatic, visionary, and situational leadership, influence processes, and group dynamics of teams. In same vein, Shook et al. (2003) review behavioral research in entrepreneurship with a focus on judgment (cognition) but pointing to emerging interest in individuals who engage in active search for opportunities (see discussion on active search below) briefly mentioning opportunity exploitation activities. Shook and colleagues observe: “Perhaps the most under-researched aspect of individual and venture creation is exploitation activities. We know very little about the role of the individual in acquiring resources and organizing the company” (p. 390). We concur.

Several scholars have postulated behaviors that are important to opportunity exploitation without testing or measuring these. For example, Shepherd et al. (2000) suggest venture survival depends on organizing activities such as specifying tasks, allocating people to tasks, defining authority structures, and building communication channels. The next section of this chapter offers a brief review of recent empirical

research that includes entrepreneurial behavior. Following that, we attempt to frame entrepreneurial behavior concretely and call for better measurement. Finally, we offer five research areas wherein entrepreneurship scholars can build upon the foundation of organizational behavior.

23.2.2 *Empirical Efforts*

To examine contemporary entrepreneurial behavior research, we reviewed empirical papers published over the last 3 years (2005–2007) in two top entrepreneurship journals—*Entrepreneurship Theory and Practice* and *Journal of Business Venturing*. While we recognize that research on entrepreneurial behavior is published in other journals, like *Journal of Applied Psychology* (Baum and Locke 2004), and *Management Science* (Baron and Ensley 2006), we chose to focus our attention on *Entrepreneurship Theory and Practice* and *Journal of Business Venturing* as they, in our view, represent the two most recognized entrepreneurship journals and should provide a reasonable approximation of the approaches and findings of scholars. We identified articles pertaining to behavioral constructs at the individual and group levels. To focus on research addressing the entrepreneur, we excluded research addressing strategic firm decisions such as competitive stance or internal policies, corporate entrepreneurship including that of small organizations, older firms, and venture capital, and other stakeholders. We included only empirical papers as these efforts show operationalizations of behavioral constructs, which we consider important in assessing the state of entrepreneurial behavioral research. A total of 28 empirical articles that address behavior are shown in Table 23.1. The total number of articles published in these two journals was 223+, so empirical studies of behavior constituted about 12% of published efforts in this time period.

This limited review of the literature is insufficient for a theory-based approach to entrepreneurial behavior but it does serve to highlight the relative lack of attention to behavior in recent entrepreneurship literature. This is surprising insofar as individual and group levels of analysis remain a strong focus in entrepreneurship. While there has been some fertilization from organizational behavior, with its extensive research (Gatewood et al. 2002; Vecchio 2003), much more could be done. To illustrate the fragmented nature research on entrepreneurial behavior, we have divided the articles into four groups—entrepreneurial behavior as a criterion for sampling, as an independent variable, as a dependent variable, and description of behaviors based on social theories.

Behavioral precision began with the initiation of a national panel study of startups in the United States where the first data collection and test of the sampling procedure was done in 1992 with the adult population in Wisconsin (Reynolds 2000; Reynolds and White 1997). Eventually, this led into the Panel Study of Entrepreneurial Dynamics (PSED) conducted by telephone and mail from 1998 to 2000. See Garnter et al. (2004) and Reynolds (2000) for details on methods and sampling. This was followed by similar studies internationally as part of the Global Entrepreneurship

Table 23.1 Summary of literature

Year/Journal	Citation	I, D, C variable	Exemplar behaviors
2005/ETP	Corbett (2005)	?	Market testing, selecting options, finalizing choices
	Forbes (2005)	I	Implied delegation, consulting with outsiders, scanning, analysis, planning
	Fiegener (2005)	D	Involvement of board
	Rauch et al. (2005)	I	Training/development of employees, encourage others to participate initiate, communicate goals
	Singh and Lucas (2005)	D	Prepare business plan
	Hite (2005)	?	Working for partner, problem solving, communicating
2006/ETP	Orser et al. (2006)	D	Apply for external capital
	Alsos et al. (2006)	I	Adding, hiring a new team member
	Forbes et al. (2006)	D	Adding, hiring a new team member
	Vanaelst et al. (2006)	?	Joining or leave team, roles
2007/ETP	Schjoedt and Shaver (2007)	C	Trying to start a business
	Hanlon and Saunders (2007)	I	Receiving support
	DeTienne and Chandler (2007)	D	Self-reports on behavior sequences
	Langowitz and Minniti (2007)	C	Trying to start
	Cloninger and Oviatt (2007)	D/C	Internationalize
JBV/2005	Talaulicar et al. (2005)	I	Decision-making processes
	Grandi and Grimaldi (2005)	?	Articulation of roles, interaction with external agents
	Chrisman and Hall (2005)	I	Guided preparation in the research, planning and “activities” by advisors
JBV/2006	Kolvereid and Isaksen (2006)	D	Starting up a self-employment entity
	Ebben and Johnson (2006)	D	Bootstrapping such as delaying payments, joint utilization
	Ensley et al. (2006b)	I	Transformational and transactional behaviors
	Lichtenstein et al. (2006)	I/D	Strategic organizing—many behaviors talking with friends, formatting book
JBV/2007	(Watson 2007)	I	“Networking”
	Gruber (2007)	I	Market mix planning

(continued)

Table 23.1 (continued)

Year/Journal	Citation	I, D, C variable	Exemplar behaviors
	Tornikoski and Newbert (2007)	I/D	Categories of activities
	Lichtenstein et al. (2007)	I	Activities
	Haber and Reicheil (2007)	I	Writing business plan

Monitor (Arenius and DeClercq 2005; Langowitz and Minniti 2007). Embedded within the survey two questions were designed to identify nascent entrepreneurs: (1) Are you, alone or with others, now trying to start a business? (2) Are you, alone or with others, now starting a new business or new venture for your employer?

Together the telephone interview and mail questionnaire provided information on a broad range of topics including activities of individuals that might be related to success in organizing an entrepreneurial business. There are two primary advantages to the PSED data set. First, the data were collected contemporaneously with the new venture creation process, unlike samples based on retrospective accounts. Second, the PSED data set allows for generalizations to the United States as a whole when post-sampling stratification weights are employed as these make the aggregate sample match the population in sex, race, age, and education level.

Subsequent research with this data set has developed a behavioral criterion for when an individual is a “nascent” entrepreneur by whether or not they have engaged in a number of behaviors, such as having developed a product/service, established credit with suppliers, filed a tax return for a new business, hired employees for pay, or invested own money (Garnter et al. 2004). Other studies categorize a respondent as having an operating business based on some of these behaviors (e.g., Edelman et al. 2008). In this way, *behaviors are a sampling criterion*.

Entrepreneurship research uses *behavior as an independent variable*. Here specific behaviors such as locating the business in a specific area, writing a business plan, opening a business bank account, seeking outside advice (Haber and Reicheil 2007; Lichtenstein et al. 2007; Tornikoski and Newbert 2007), or the degree of improvisation or number or pacing of activities (Hmieleski and Corbett 2008; Lichtenstein et al. 2007) might predict something, usually venture outcomes. In other studies, behavior is less specific and more cognitive to include self-reports of planning and time spent on planning (Alsos et al. 2006; Chrisman and Hall 2005; Gruber 2007) or initiating investor relationships measured in part by a self-report of confidence in “identifying sources of finance” (Alsos et al. 2006). Often behavior is global in nature (e.g., as an indicator of transformational leadership, “provides vision,” Ensley et al. 2006b). Just as often, it is global in nature and poorly measured. For example, employees reported “support for personal initiative” and “communicating business goals” using single items (Rauch et al. 2005). In most cases, the entrepreneur’s behavior is self-reported, but in other cases (as with Rauch et al. 2005) it is captured through the perception of a stakeholder such as a member of the

venture team. Usually the focus is individual behavior of the self-reporting entrepreneur, but occasionally the focus is team behaviors such as decision-making processes (Forbes 2005; Talaulicar et al. 2005).

Other research seeks to predict behavior, treating *behavior as a dependent variable*. In some cases demographic variables that reflect human capital and individual differences such as homemaker status, sex of entrepreneur, and prior experience are used to predict self-reported behaviors (e.g., preparing business plans, choosing a location, or seeking funding, Orser et al. 2006; Singh and Lucas 2005; Wright et al. 2008). For example, DeTienne and Chandler (2007) using sex and human capital as predictors, asked CEOs of young firms to choose among four sequences of actions those they themselves or their organization took in finding and acting on their start-up opportunity. In other cases, categories of context such as organizational size, board composition, need for strategic decision making, or operations predict CEO (entrepreneur) behavior such as bringing issues to the board of directors (Fiegener 2005) or deciding to open foreign operations (Cloninger and Oviatt 2007). Organizational age was used to predict bootstrapping behaviors (Ebben and Johnson 2006). In less frequent cases, cognitions such as beliefs and intentions as well other individual differences predict nascent behaviors such as those developed by PSED or the GEM (Langowitz and Minniti 2007) or a self-reported measure of “working” in a start up (Kolvereid and Isaksen 2006). In some cases, the actual entrepreneur is not wholly visible as decision maker or implementer (Cloninger and Oviatt 2007).

While prediction is the focus of most studies, some only *seek to describe or explain behavior in the context of extant social theories*. For example, Forbes et al. (2006) sought to explain new venture hiring of new team members based on theories of attraction and resource dependence. In another example, using a single in-depth case study, Lichtenstein and his colleagues (Lichtenstein et al. 2006) observed three modes of organizing some of which are clearly behaviorally anchored: organizing the vision (expressing a strong vision) but also less behaviorally (changing thoughts and vocabulary about the opportunity); strategic organizing (tangible events such as formatting a book, deciding to publish as book or web page; committing personal funds, and coping with non-venture responsibilities); and tactical organizing (developing a product/service, establishing credit with suppliers, filing a tax return for a new business, hiring employees for pay, or investing own money).

In most cases, the behaviors are self-reports and are broad and unspecific in nature (e.g., initiating investor relationships, preparing a business plan, articulating a business idea). These behavioral constructs are not necessarily linked to observable objective behaviors and could be interpreted in very different ways by different audiences, but these kinds of constructs are often used in entrepreneurship research. For example, in the DeTienne and Chandler (2007) study, behaviors were self-reports of action sequences, which included “I/we found or developed a product or technology then looked for a market”. A would-be or even successful entrepreneur might have some understanding of concrete referents for “product or technology” but may not differ widely on what is done to “look for a market.” Another example is the use of self-reports by entrepreneurs of their strategic actions of exploration and exploitation (e.g., “We are usually one of the first companies in our industry to

use new, breakthrough technologies”; “We frequently adjust our procedures, rules, and policies to make things work better” (Bierly and Daly 2007). We suspect that different audiences will concretely interpret “use of new, breakthrough technology” and “adjusting rules” in behaviorally very different ways.

In only one case in our review did an empirical article include behavior as both an independent and a dependent variable. Tornikoski and Newbert (2007) used PSED data for both independent and dependent variables. They looked at venture improvising (prepare business plan, start marketing, apply for patent, project financial statement, open bank account, list in phone book), resource combination (develop prototype, purchase raw materials, purchase facilities), and networking (ask for funds, establish credit, received outside assistance) as predictors of organizational emergence (make a sale, hire employees, received external funding).

Finding a paucity of empirical research and a lack of conceptual clarity on entrepreneurial behavior, we propose further refinement of our behavioral research methods. Following that we propose four broad organizational behavior areas from which entrepreneurship scholars can borrow, as long as we borrow wisely.

23.3 Behavioral Research Methods for Entrepreneurship

Entrepreneurial behaviors are discrete units of individual activity that can be observed by an “audience” and that have a meaning that is likely to be shared between actor and audience. By this definition, teams and organizations do not behave but individuals comprising them do. By this definition making a decision is not a behavior, announcing a decision is a behavior.

Many of the “behaviors” of entrepreneurship research are not discrete but complex and often ill defined. Planning a business is not a discrete unit of activity but a complex set of activities, some done sequentially, most done iteratively, almost always with interruptions for other activities, some done alone and others done by outsiders, such as consultants or teams of local college students. The behaviors embedded in “planning” might include consulting a text or template for business plan components (market size, competition, costs, legal protection, potential financing sources, board of advisors, etc.) and gathering information on various plan components through the discrete acts of web search, telephone calls, business meetings, etc. Planning also includes codifying and prioritizing the information and sense making through writing and speaking of the plan.

Bhide (2000) in his review of the process new ventures take to become large and enduring organizations draws on data from these large firms (no longer start up, nascent, or entrepreneurial by most definitions). He sees “critical tasks” for new ventures to include articulating audacious goals, formulating strategy, and implementing strategy which are likely comprised of many different behaviors of individuals (or teams). Only in his discussion of implementation of strategy does Bhide give hints at what behaviors one might want to engage to grow a venture (e.g., finding specific store locations, negotiating leases). Unfortunately other implementation behaviors are quite broad (e.g., upgrade resources, build infrastructure).

Behaviors need to be distinguished from their results. Asking for funds is a behavior (from whom, how, and when might usefully be specified), whereas receiving funds is a result. Writing a business plan is a behavior, having a written business plan is a result. In this particular case, entrepreneurs who hire others to write their plan are behaviorally distinct from those who write their own plan. When we use results as a surrogate for behavior, we infer behavior. Sometimes this is sensible, but it leaves the audience to our research to imagine what the entrepreneur actually did to achieve the result.

23.3.1 Molarity Issues

Just how specific should our behavioral variables be? Early behavioral psychologists applied the term “molarity” to behavior to focus attention on meaningful perceptual behavioral units or activities. Just as in chemistry a “mole” is a unit of matter that is often more useful than an atom or molecule, the meaningful unit of behavior is more useful than its component behaviors. For example, using the Internet for 4 h to research markets or competition is more useful than the specific flexing muscles, moving joints or in our example, keystrokes. These “molecular” behaviors are less visible and combine together to make the observable behavior qualitatively different from underlying physiological processes (Baum 2002; Hauser 2006). We apply the concept here to focus attention on the wildly divergent sizes of behavioral units that are reported in the entrepreneurship literature. Whereas behavioral psychologists (e.g., Edward Toleman and others) differentiated holistic units of behavior from reflexive, simple stimulus–response connections, entrepreneurship scholarship errs in making our behavioral units far too galactic in size.

Behavior is concrete, not abstract. To pass the test of being behavior, it must be theoretically, if not practically observed by someone (or something in the case of a recording) other than the actor. It refers to an action or set of actions that can be seen, heard, or measured. Many of the behaviors of entrepreneurship research are under-specified and operationalizations unique to the particular manuscript and purpose (and far too often based on self-reports and single-items). A respondent, another researcher or a student wishing to learn to act as an entrepreneur, may not know what specific action is called for.

The behaviors listed in the PSED/GEM studies come close to the specificity we may need; some more so than others. For example, one PSED behavior is “applied for patent.” We may not need to know that the entrepreneur read the requirements and completed and submitted the paper work and paid the fees for patent or that they hired a patent attorney to do this for them. However, other PSED behaviors remain less specified. What specifically does one do to “define market opportunities/customers, competitors”?

We do not expect or suggest that entrepreneurship scholars drill down to keystrokes or “molecular” behaviors. We do think that just as scholars recognized the need to collect and report demographic data on respondent individuals and firms

(so that context and comparisons could be made), we need to present greater unity on how we measure behavior. One step is finer granularity and another to begin to use similar if not identical operationalizations of key behaviors.

23.3.2 Need to Move Beyond Self-Report Methods

Since the behaviors of interest to entrepreneurship scholars are consciously undertaken, individual actors can reasonably report on their behaviors. But as is true in other research critiques (e.g., Chandler and Lyon 2001), self-reports are limited by recall and social desirability bias. Self-reports of behavior can be more reliably and accurately obtained with any variant of an experience sampling diary (beeper) method (Spain et al. 2001) to capture frequency, sequence, duration of behaviors within and across entrepreneurs. These methods suffer from being intrusive but could provide us with a finer grain on what entrepreneurs actually do. Behavior can be assessed with other methods including observation both in the field and in the laboratory. Field observations are done and done well (Lichtenstein et al. 2006, 2007) but suffer from the inability to gather sufficient sample sizes to generalize. Laboratory studies (using experimental designs) in entrepreneurship are few and none, to our knowledge, observe behavior. Often these types of studies use students (not entrepreneurs) as subjects (Grichnik 2008), are often time consuming, and require the subject to be in a laboratory environment. It might also be possible to obtain unobtrusive measures of behaviors (Webb et al. 2000) if entrepreneurs could reasonably be expected to show up at a conference, meeting, or web site. This type of measure could count clicks, visits, or even employ photography or video methods. Finally, of course, is ask others who observe entrepreneurs to report on their observations, a method best used if triangulation (multiple observers) is employed.

As a field of research, let us move beyond self-reports as our primary way to measure behavior. If we must use self-reports, control for social desirability, which is the tendency to report socially desirable but possibly untrue results (Arnold and Feldman 1981). Let us employ the rigorous methods of other social scientists.

23.3.3 Need to Move Beyond Single Items

One of the most serious threats to research on entrepreneurial behavior, which was evident in the early research on entrepreneurial traits, is poor construct measurement. Considering the relatively complex nature of new venture creation and of entrepreneurial behavior, quality measurement is crucial (Boyd et al. 2005; Godfrey and Hill 1995). While advanced statistical methods allow single items to serve in statistical models, a real question must be raised about not only reliability but also validity since a single-item measure can be ambiguous with respect to the intended meaning and can be changed by the context of previous items. Reliance on

single-item measures at the exclusion of multi-item measures weakens results. More than two decades ago, marketing researchers (Churchill 1979; Jacoby 1978) critiqued the use of single-item measures to assess constructs. As Jacoby puts it:

Given the complexity of our subject matter, what makes us think we can use responses to single items (or even to two or three items) as measures of these concepts, then relate these scores to a host of other variables, arrive at conclusions based on such an investigation, and get away calling what we have done Quality research? (1978, p. 93).

Considering the majority of research in entrepreneurship, even recent research, in the context of Jacoby's comment, how can we, as entrepreneurship scholars, claim that we have advanced the literature instead of adding clutter to our collective understanding of entrepreneurship.

Reliability of measurement is better assured and often obtained through psychometric development of scales comprised of multiple items. Reliability is a requirement for self-reports and other reports of behavior but also a requirement for measures of cognitive, motivational, attitudinal, and perceptual constructs. Reliability refers to the extent to which a measure is repeatable (Nunnally and Bernstein 1994) and consistent (Torabi 1994). Since reliability is a necessary condition for validity, unreliable measures lessen the observed correlation between measures. Consequently, if the correlation between two construct measures is low, it is not possible to determine whether there is no relationship between the two constructs or whether the measures are unreliable (Peter 1979). A single item to assess behavior not only is psychometrically unreliable, but often grossly over-simplifies behavior.

A good example of a study that used multiple items for all independent and dependent variables is offered by Baum and Bird (2010). Of particular interest here is the behavior scale of "multiple improvement actions" which used eight items such as "We frequently experiment with product and process improvements" and "Continuous improvement of our products and processes is a priority".

23.3.4 Need to Include Time

There are critical time lag issues in translating cognitions into behavior and behavior into results. There are issues of how long a behavior takes to complete (when it begins and when it is finished and a new behavior begins). In the experimental design framework, the time between an independent variable change and a dependent variable measurement for the effects of that change is subject to "errors" that include history. Things happen between the formation of an intention and action based on that intention, especially when dealing with complex and relatively "galactic" behaviors such as defining markets and competition. These historical effects are likely to be more confounding the longer the behavior takes to complete. When does the entrepreneur begin planning and when is she finished? When does she begin to ask for funds and when does she get an answer (or the funds)? When does she approach her first customer and when does she make the first sale? These are identifiable behaviors and results, which are considered clear indicators of venture start-up according to Carter et al. (1996).

Undoubtedly, the entrepreneur is juggling these “behaviors” with other behaviors such as filing for patents, purchasing equipment, leasing space, etc. An illustrative example of juggling “behaviors” (activities) is *Heather Evans* (Roberts 1998). In this case, Heather incorporates the business, designs a clothing line, hires and pays an employee, arranges for factoring and production, locates a location for her store, and more while still attending classes at Harvard Business School and conducting a field study as well as moving from Boston to New York to further facilitate her venture creation process.

23.4 Behaviorally Anchored Research Agenda

As we addressed the very large issue of entrepreneurial behavior, we considered finding links between the issues and problems of entrepreneurs and the theories and research in the more mature field of organizational behavior. Clearly, entrepreneurship scholars are importing many ideas from OB, such as leadership (Ensley and Pearce 2001); job characteristics and satisfaction (Schjoedt 2009; Schjoedt and Shaver 2007); and team formation, composition, and processes (Forbes et al. 2006). We also recognize that this book is individual centric and cognition/motivation focused, and while personality, diversity, human capital, and attitudes such as satisfaction are important and they have a longer history of inclusion and extension into entrepreneurship, they are not behavioral but rather precursors to or moderators of behavior. For example, the growing body of research on women and minority entrepreneurship (Alsos et al. 2006; DeTienne and Chandler 2007; DeTienne et al. 2008; Essers and Benschop 2007) and the extensive research on personality characteristics of entrepreneurs (e.g., Stewart and Roth 2007) has applied OB insights but are not behavioral. Much of the rest of the OB domain is less directly relevant (e.g., political behavior, organization culture and design). Rather than repeat the overview of possibilities of OB-inspired research covered by Baron (2002), we choose to point to five areas of potential use to entrepreneurship scholars and practitioners. Three are strongly anchored in behavior (1) leadership (including shared leadership), (2) communication, (3) behavioral roles and two are less behavioral but critically important areas of (4) creativity and (5) opportunity discovery.

23.4.1 Leadership

We believe that the vast body of leadership research does pertain to entrepreneurship and excellent reviews of intersections for entrepreneurship scholars are offered by Cogliser and Brigham (2004) and Vecchio (2003a). Leadership is simultaneously about individual leader/entrepreneur behavior and the relationship of the leader/entrepreneur to the “followers” or “constituents” and external environment of the organization being formed and grown. It bridges the individual to the team and to

the eventuality of dissent, political behavior, and organizational culture. We will provide a short review of the OB approach to leadership behavior framed as that stream of research shifted from traits to behaviors. Then we add the more recent work on shared leadership that may of particular interest to new ventures.

Leadership research began with attention to traits of executives. When those traits (e.g., intelligence, achievement motivation, power motivation) did not sufficiently discriminate between leaders and those in other roles such as managers and did not predict who would become a leader, attention shifted to leader behaviors. However, important trait-related leadership research continues (Kouzes and Posner 2002) as it does in entrepreneurship research (Ciavarella et al. 2004; Zhao and Seibert 2006). The behavioral study of leaders (Fleishman 1998) which is discussed below found two sets of behaviors that describe leaders—initiating structure/task focused and consideration/people focused. Again, the power of these tools to predict and shape leaders proved to be less than ideal and researchers proceeded to develop the currently most advanced theories, which address contingencies for when specific leadership behaviors or styles are more effective in achieving organizational results (House 1996).

The behavioral study of leaders, which was undertaken by a large interdisciplinary team including personnel officers of the military services, foundations, and firms and led by researchers at the Ohio State University, began with a definition of leadership: “behavior of an individual when he is directing the activities of a group toward a shared goal” (Hemphill and Coons 1957). The team held long discussions during which apparent conflicts arose over issues of independence of dimensions of leader behavior, linkages to existing theory, the molar–molecular level of analysis, and whether objective measurement was possible from asking about frequency of behavior (in a Likert-type scale). With some reservations, the team settled on nine leadership dimensions (integration, communication, production emphasis, representation, fraternization, organization, evaluation, initiation, domination). The team and two advanced classes at Ohio State University, based on their experience and knowledge, used these dimensions and their descriptions to create 1790 potential items for an instrument. The team used their own expertise to determine items that belonged to only one of the nine dimensions and eliminated items that overlapped content and reduced the number to 150 behavioral descriptions, a number which would fit on an IBM test answer sheet (remember this study was published in 1957 and conducted before the development personal computers in the 1960s or SPSS and SAS in 1968). In creating Likert-like scales for each item, the team debated and eventually structured an approach selecting the frequency and extent adverbs to use (e.g., Always–Never, Often–Very seldom, A great deal–Not at all, each with five anchors). They empirically tested the Leader Behavior Description Questionnaire (LBDQ) on 357 individuals (205 were describing a leader of their group and 152 describing themselves as a leader). Groups included educational, social, military settings, and a diversity of respondents. From this and subsequent studies, two factors (initiating structure and consideration) and shorter scales with strong psychometric properties were developed (Stogdill and Coons 1957).

We believe that entrepreneurship scholars could apply the methods used in the behavioral approach to leadership to achieve more highly consistent measures of entrepreneurial behavior. Once those dimensions and measures have been psychometrically tested, entrepreneurship scholars can advance to our own contingency approach to entrepreneurship behavior. We believe this is the optimal way to “borrow” from OB research and that merely applying extant leadership measures and models to entrepreneurs will not suffice if indeed entrepreneurs are different from executives, team leaders, or supervisors who are the focus and respondents in mainstream OB leadership research. As “sexy” as it may be to apply new models, such as transformational–transactional leadership (Avolio and Yammarino 2002) to entrepreneurs, these efforts move away from entrepreneurship as a distinct phenomenon.

23.4.2 *Shared Leadership*

Although leadership is a social process involving both leaders and followers (Lord et al. 1999), leadership scholars have largely focused on the leader as an individual in a hierarchical system which makes sense given the history of OB leadership emerging from studies of the military and large organizations (Campbell et al. 1970). Hierarchical or vertical leadership is based on unity of command that stems from an appointed or formal leader of a team (e.g., the CEO) (Daft 2004). In contrast, shared leadership is a form of distributed leadership that occurs when all team members are engaged in the leadership of the team. Shared leadership is “a dynamic, interactive influential process among individuals in groups for which the objective is to lead one another to the achievement of group or organizational goals or both” (Pearce and Conger 2003). Thus when leadership is shared within the team, the member with the most relevant experience, knowledge, skills, or abilities pertaining to the situation facing, the team communicates and influences others on the team. Through debate (i.e., the statements, action, and reactions of the debating team members) the team develops commitment to a decision to take action. For shared leadership to emerge, members of the team must have a shared purpose (i.e., venture success), provide support to one another by communicating their agreement or support, and opportunity to voice their views via debate (Carson et al. 2007).

At least five factors influence the appropriateness of shared leadership (Pearce and Manz 2005)—situational urgency, need for creativity and innovation, team member commitment, task interdependence, and degree of complexity. In situations with a high level of urgency, hierarchical leadership may be more appropriate than shared leadership. Even though there are few truly urgent situations facing most organizations, urgent situations may be more prevalent in new ventures. For example, bootstrapping to meeting payroll on a week-to-week basis may present an urgent situation where delegation to one team member is appropriate. Even though shared leadership is not necessarily appropriate in urgent situations, shared leadership may provide a basis for avoiding urgent situations in the first place by providing creative solutions to reoccurring problems.

In contrast, creativity and innovation are important factors for the development for the new venture and its product/service offerings. When members of the entrepreneurial team share their various points of view and influence each other in problem solving and decision making, they build a collective creative capacity. The commitment of team members to go beyond what is minimally required might be expected in new venture teams when each member has a stake in its success and this commitment contributes to the potential for shared leadership. When task interdependence is high and the tasks are complex, as when team members take on different specific roles such as technical development, market creation, and financing, shared leadership becomes more important and possibly more likely. In addition, shared leadership lowers monitoring costs and provides a system of checks and balances of team members' actions and performance (Barker 1993; Pearce et al. 2008).

There is some emerging evidence of the effectiveness of shared leadership in new venture teams. Ensley et al. (2006a) studied 66 top management teams drawn from Inc. Magazine's annual list of the 500 fastest growing US firms and 154 randomly sampled top management teams of start ups from Dun and Bradstreet. They found that both shared and hierarchical leaderships predicted new venture performance, with shared leadership having a stronger effect in both samples. We believe that these findings and the novelty of shared leadership as a research topic point to shared leadership as a fruitful avenue for entrepreneurial behavior research. To get objective team behaviors of the appropriate "molarity" will be an important research problem to solve. Clearly teams provide a minimum of triangulation on the emergent behaviors of shared leadership.

This setting may also be one where participant observation is appropriate and useful. It may also be worthwhile to return to systematic observation of behavior in new venture teams rather than relying on self-reports. Bales and others (Bales 1951; Hare et al. 1955) developed a system of observing, counting, and categorizing group interaction which may be useful to those truly interested in new venture groups and the emergence and evolution of shared leadership as well as group-level communication, role development, creativity, and systematic search (below).

23.4.3 Communication

Communication is critical to entrepreneurial organizations—from writing a business plan through incorporation and team building to selling a product or service, some form of communication occurs. Communication is critical to overcoming the liabilities of newness since actions taken to legitimize, create a positive perception or reputation, and establish reliable production, delivery, and accountability systems all involve communication or display. Given its critical role and potential for easy observability (Ziegler et al. 1992), it is surprising that little research directly addresses communication behaviors of entrepreneurs.

Communication briefly defined is information exchange, which can be one way or two way in dyad linkages. That is, the communication process has sender, receiver, and mediating variability. Communication can be seen as precursor to and

outcome of intentions. As a precursor/mediator, we ask what role communication plays in forming the intention. Receiving information through listening (reading) or watching may be more critical for shaping an intention than is sending information through speaking or writing. As an outcome of intention, one of the earliest acts entrepreneurs take to manifest their intentions is to speak/write about it. Speaking and writing are entrepreneurial behaviors that warrant additional academic research. If a product is developed, prototyping and displaying become critical. For both directions (the sending and receiving of information), cognitive errors can become communication errors but at the same time communication can reduce those perceptual or cognitive errors through feedback and iteration.

There is a scattering of conceptual and theoretical work that addresses or touches upon communication in the entrepreneurship process or setting. One example is debate about the impact of written business plans on venture outcomes (Honig 2004). Others have theorized about the translation of entrepreneur's mental models (sense making) into communication (sense giving), entrepreneurial vision communication (written and spoken), and the importance of linguistic metaphors (Hill and Levenhagen 1995). More recently, empirical studies found vision communication to have significant impact on venture growth (Baum et al. 1998). Communication is sometimes assumed and sometimes measured as "frequency of contact" in the growing literature on entrepreneur's social network and social capital (West 2007; West and Wilson 1995) and entrepreneurial teams (Forbes et al. 2006; Schjoedt 2009). Extending beyond the start-up processes and early opportunity identification communication is critical to venture financing, alliances, and technology choices (Redoli et al. 2008; Roodt 2005). Included here is the choice of what information to share, with whom and when and includes the issues of non-disclosure and protection of intellectual property. In addition, communication is critical and problematic for entrepreneurs who internationalize or establish virtual workplaces (Matlay and Westhead 2007; Todd and Javalgi 2007). Finally communication takes on greater complexity and perhaps more importance in teams. Sharing leadership and working as a team requires individuals to listen more and talk less, ask more questions and offer fewer answers, and openly share information.

Entrepreneurship scholars could more precisely link the cognitions, which are the foci of this book, to venture outcomes (start ups, organizations, growth of organizations) through careful attention to communication as a mediator of those intentions, with stories and narrative methods as important considerations (see discussion below). One highly cognitive turn on communication is the potential of entrepreneurs "inner conversation" or self-talk (an element of thought self-leadership) (Neck et al. 1999). Thinking out loud protocols are a way to operationalize this (Sonnentag 1996).

To develop our research on communication as entrepreneurial behavior, we might usefully form research relationships with communications scholars (from a range of specialties including rhetoric, social construction, and public relations) and scholars in information technology who are grounded in communications theories. Among the many questions we might ask are: How does a web-centric start up communicate effectively to gain legitimacy and reputation? What forms of communication best lead to commitments of others to the intention? What channels

of communication are most useful and for what purposes? What types of communication errors are most likely among entrepreneurs of different types (novices, experts, gender, ethnic, and age differences) and at different stages in the venture creation process?

23.4.4 Behavioral Roles

Roles are abstractions and aggregations of behaviors, tasks, activities that comprise sensible, meaningful clusters (Mintzberg 1973) and differ from what Vesper (1980) and others refer to as “types of entrepreneurs.” So while we have argued for precision and finer-grained accounting of behavior, we also believe that aggregation of individual behavior into roles is of potential value. Mintzberg found ten *managerial* roles in three clusters—interpersonal, informational, and decisional (one of which was “entrepreneurial” and referred to planned change inside organizations). If entrepreneurial behavior is to be distinct from managerial, entrepreneurship scholars need to follow Mintzberg’s model, observe entrepreneurs, and “chunk” behavior into roles that they perform. These might be opportunist (finding, shaping opportunity), resource acquirers, salesman, etc. To do this, we must be clear on what constitutes role and the dynamics of role processes.

The concept of role derives, in part, from the dramaturgical approach to behavior (Goffman 1959), which uses theater as a metaphor for social interaction of many kinds. Many conceptual and some empirical efforts have hinted at the dramaturgical approach to entrepreneurship. The seminal paper by Gartner et al. (1992) titled itself “Acting as if.” One of the original outlines for that paper included a section on roles and scripts, entrepreneur as actor. Gartner (personal communication, 1990) commented “I want to get as much in about Stanislavski’s book *CREATING A ROLE* as possible, but there is a lot of material on roles that would be valuable to have.” The dramaturgical approach would consider (among other elements) the relationship between actor, audience, backstage and outsiders (Goffman 1959), props, timing, costumes, impression management, rehearsals, and, importantly, the story being told. That section never got written into the text of the 1992 article. Nor did that manuscript make good use of the “if” of its title. In theater, the “if” is a method acting instruction that allows the actors to bring authenticity to the stage or screen (e.g., acting as if there were a man with a gun in corner). “*If* acts as a lever to lift us out of the world of actuality into the realm of imagination” (Stanislavski 1948). Insofar as ventures operate to create novelty, “something out of nothing” (Baker and Nelson 2005) or fulfill a vision (Baum et al. 1998), this *if* is important. Finally, the manuscript left out the mystification of the audience (its willingness to believe in the story of possibilities). For mystification to occur one of the five elements of social interaction is absent or obscure: the act (what is done), the scene (when and where), the agent (actor, here the entrepreneur), the agency (how the actors do it), or purpose (Manghan and Overington 1983).

Since then there has been some attention to role-related improvisation in the entrepreneurship literature (Baker et al. 2003; Hmieleski and Corbett 2008) which has both musical and theatrical roots. However, entrepreneurial behavior as drama and storytelling has not been developed other than the efforts by Martens et al. (2007) and Gartner (2007) who develop a narrative method issue of the *Journal of Business Venturing*, methods which are discursive, reflexive, and sense making and deal with story meaning and context.

There has been virtually no research on role taking and role making or role theory as it applies to entrepreneurs.¹ Scholars who do use the term “role” use it in different ways, lending to imprecision. When the role concept has been applied to entrepreneurship it often refers to how entrepreneurs are different in economic and organizational functions compared to other individuals. Thus some research and commentary refer to the role of entrepreneur as venture creator, change agent, risk bearer, or champion for innovation (Gartner 1988; Hayek 1985). Some use the term or imply the term when comparing nascent entrepreneurs to others (Carter et al. 2003) and when looking at categories of experience prior to becoming an entrepreneur (Dorbrev and Barnett 2005; e.g., previous work roles). Markman and Baron (2003) conceptualize person-role fit for entrepreneurs but do not cite role theory or operationalize that fit.

Katz and Kahn (1978) have defined role as a set of expectations about the behaviors of the role holder (here, the entrepreneur). Expectations about conduct are sent by individuals or groups that have formal, organizational relationship to the entrepreneur (e.g., investors, customers, and employees) and by those in informal relationships (e.g., family and friends). These expectations can be explicit (telling) or implicit (nonverbal signals or observed in a role model) and inform a “role schema” or prototype about what an entrepreneur is supposed to do (generally or in a specific situation). These expectations can conflict among senders resulting in role conflict for the entrepreneur; they can vary in clarity or change over time, resulting in role ambiguity for the entrepreneur; they can exceed the skills, resources, and time of the entrepreneur, resulting in role overload for the entrepreneur. Role conflict, ambiguity, and overload are sources of stress for entrepreneurs (Ortqvist et al. 2007; Schindehutte et al. 2006).

Role theory as described above was developed for organizational behavior settings (existing, often large, and formalized organizations) where roles and jobs are more clearly defined, not for organization creation. As we have discussed, the work, job, tasks, and expected behaviors of entrepreneurs are conceptually underdeveloped. However, social psychological constructs related to role such as identity and self-efficacy have found a place in the entrepreneurship literature (Down 2006; Elfring and Hulsink 2007; Martens et al. 2007). Of potential value is the literature on role taking or shaping and role transitions which entrepreneurial

¹ ABIinform found only two articles with the joint search fields of entrepreneur and role behavior. The same two articles surfaced with search terms of entrepreneurship and role behavior. One article, Ortqvist et al. (2007), is in an obscure journal and described below. The other article dealt with corporate entrepreneurship.

literature treats in the context of careers (Burke et al. 2008; Schjoedt and Shaver 2007) and learning (DeTienne and Chandler 2004). However, the role behaviors of the entrepreneur are not developed.

The novice entrepreneur, before becoming an entrepreneur, has had other roles and must transition from employee, student, etc., to entrepreneur. The early work of Nicholson (1984) provocatively suggested that entrepreneurs might take on that role with less change to themselves and more proactive determination of the content and structure of their role or work than organizational employment transitions (e.g., from individual contributor to supervisor). To date, only one study has attempted to empirically test this assertion. Ortqvist et al. (2007) measured entrepreneurs' perception of their role redefinition (self-reports of negotiating different expectations or changing personal priorities or expectations of self) and role behavior (increasing performance or passively withdrawing or engaging in diversions). They found that negotiating expectations and increasing performance to meet role expectations associated with higher venture performance.

More research on role taking and shaping of entrepreneurs could follow and use a finer grained approach to self- and other expectations about behavior as entrepreneurs develop. While there are many provocative research questions, we propose these: To what extent and how accurately and effectively do role schemas develop out of active experience (class room activities, role modeling) compared conceptualizing (reading/watching about entrepreneurs in the media)? To what extent do entrepreneurs experiment with imitation and find "true-to-self" behavioral strategies or roles and evaluate those strategies (Ibarra 1999) and are these more effective than other processes that result in behavioral strategies? How much novelty, autonomy, and discretion (Nicholson 1984; Parasurman et al. 1996) do entrepreneurs have in creating their role at the various transitions from nascent, start up, small business, family business, growth business, publicly traded/acquired business? To what extent do factors such as cognitive complexity, role breadth, self-efficacy, and situational attributes such as feedback and time spent "acting as if" mediate transitions in entrepreneur's roles (Neale and Griffin 2006)?

23.4.5 Creativity

This section takes a turn from our previous considerations above insofar as entrepreneurial creativity is an enormous construct worthy of a book on its own merits. Creativity research is also far from being "behavioral" in the way we call for. Creativity in entrepreneurs encompasses traits, intelligence, processes, abilities, competencies, and behaviors that produce effective novelty, generating variations that have relevance to the situation or task at hand (Amabile 1996). This creativity applies importantly to opportunity identification (Corbett 2005; Ward 2004). In addition to playing an important role in shared leadership (Pearce and Manz 2005), creativity competence plays a role in the growth stages of a venture (Baum and Bird 2010).

Generally most scholars accept that creativity is a cognitive and behavioral process (Csikszentmihalyi 1996), similar to problem solving, that begins with some sort of tension, followed by preparation (information collection and immersion), incubation, insight (articulation or expression), evaluation, followed by elaboration and iteration where the “devil is in the details.” The process is rarely linear but iterative and recursive and includes both conscious search and expression but also often deeply subconscious incubation. Most creative insight comes as a result of immersion in an intellectual, economic, or social domain and/or immersion in a problem or object of curiosity. In many organizational and educational settings, the problems are presented and the individual asked to apply themselves to develop a solution. Presented problems often have a “rightness” or rationality criteria applied (or implied) to solutions, from cost-effectiveness, political correctness, timeliness to fit with prototype (as in educational settings where we grade exams, case solutions, and research assignments).

Finding problems (opportunities) worthy of solution (or new venture creation) may emerge from the three sources provided by Csikszentmihalyi (1996). One source is personal life experience, including overcoming deprivations and setbacks, a life-long habit of curiosity, or frustration with a product or process in the marketplace. The second source is knowledge of the domain and recognition of anomalies or gaps in knowledge and/or the ability to bridge to other domains. The third source is the larger social environment that might include having trusted “think tank” friends or advisors and the emotional intelligence or “presence of mind” while experiencing social or economic chaos. Whatever the source, creativity takes incubation time, time for reflection, and puttering—sometimes only moments and at other times, years.

Most of the approaches to creativity in entrepreneurship and the larger domains of organizational behavior and psychology have not addressed creative behavior in the way we call for in this chapter (molecular enough to specify the observable actions taken). It turns out that measures of individual creativity in these larger domains vary widely in what they measure, what audience is appropriate for the measure, and usefulness in surveys, field studies, and experimental design. Most psychology and organizational behavior approaches look for personality precursors (openness to experience, tolerance for ambiguity), while others more in line with this book focus on cognition to assess individual creative capacity (Simonton 2003).

Psychologists partition the measurement of creative capacity into *creative products* such as drawings, lists, stories, etc., and *creative cognitions* which individuals use to generate these products (Cropley 1999, 2000). Organizational behavior researchers have looked at patents or idea disclosures and superior/peer ratings of individual innovativeness (which are correlated) (Keller and Holland 1982; Tierney et al. 1999). Creative products (perhaps including patents and idea disclosures) require an expert panel of judges whose expertise is in itself a source of variance although rigorous methods for this type of qualitative measurement have been developed (Boyatzis 1998).

Although there are measures of creative cognition (Guilford 1962; Torrance 1965; Treffinger 2003; Treffinger et al. 1971), these measures and others less well known are inappropriate for surveys and for field studies of entrepreneurs as they

are timed and generally oriented to a school environment. In addition, these measures which focus on divergent thinking have been criticized as not tapping the whole of creative capacity (Torrance 1965). In addition, debate lingers over whether divergent thinking (or creative intelligence for that matter) is a generalized capacity or domain specific.

More recent efforts show a broad range of creative processes (problem construction or problem finding, information encoding, category selection, and category reorganization and combination) can be assessed and significantly contribute to problem solution quality and originality (Mumford et al. 1997). Of these, problem construction is the earliest to operationalize and closest to opportunity identification and thus to entrepreneurship. These scholars (Mumford et al. 1993, 1994) used four complex and ill-defined problems and respondents chose four alternative definitions of the problem from a previously developed list of 16, which varied in use of original goals, approaches, information, and restriction of problem construction. Both of these studies used unidentified expert judges to rate quality and originality of solutions. The four problems include (1) diplomat with State Department sees colleague who has had too much to drink at a social event, (2) athlete representing your country told by a doctor he/she is going to need surgery, (3) principal at an elementary school with a snake that got loose, and (4) student on a team project with a member not showing for meetings. An additional two problems perhaps more relevant to entrepreneurship are not published.

Thus when Baum and Bird (2010) wanted to assess creative intelligence of entrepreneurs using survey methods, they chose Mednick's (1968) Remote Word Association Test (RAT) as extended by Bowden and Jung-Beeman (2003). RAT measures divergent and creative thinking by testing individuals' ability to see associative concepts among 30 sets of three words (e.g., Water:Tobacco:Stove=Pipe). RAT is a commonly used measure of creativity and has been shown to correlate with supervisor ratings of creativity (Fong 2006), which is the most common operationalization of individual creativity in OB. This worked well in their study of successful intelligence, which helped to predict new venture growth.

What of the behaviors that lead to outputs judged creative? Getzels and Csikszentmihalyi (1976) looking at problem finding and construction found that art students faced with the task of drawing still life images who did more manipulation of more of the objects (of a fixed set provided), who chose unusual combinations of objects, and who erased and changed their drawing more often produced drawings that were judged (by lay people, artists, and expert judges) as being more creative. This study found that time spent finding the problem and working out the "devilish details" of solutions is important for esthetic value and originality.

Creative problem finding and problem solving seems to engage the whole person. Gelb (1998) who consults on creativity in organizations thinks that curiosity (perhaps behaviorally assessed by asking good questions), actively engaging all senses, and developing kinesthetic or physical grace, poise, and fitness are important (and behavioral) contributors to creativity. He also proposes "mind mapping" as a way to actively and concretely explore the relationships among facets or ideas

(that may be part of an opportunity or problem). Likewise Twyla Tharp, a noted dancer and choreographer speaks of developing rituals of preparation, organizing in boxes (literally), and “scratching” for a good idea which for a fashion designer maybe visiting vintage stores, for an actor it may be doing theater games or improvisation, for others it is reading, talking with others, etc. (Tharp 2003). These writers suggest that creativity is indeed behavioral and not “merely” a function of predispositions or cognitions.

23.4.6 *Opportunity Discovery*

Like creativity, opportunity recognition and discovery is a largely cognitive process (and thus not behavioral). However, there is an emerging behavioral approach to this important competency of entrepreneurship. This approach begins with identifying the differences in cognition and behavior between novice and repeat entrepreneurs who become “experts” in opportunity recognition. Thus while some scholars claim that entrepreneurs discover opportunities by accident or luck by being alert (Kirzner 1997), other research shows that repeat entrepreneurs actually engage in an active search for opportunities based on their existing knowledge. One scholar in particular, James Fiet, has made substantial contributions to this area (Fiet 2002, 2007). Based on information economics (e.g., Hayek 1945), Fiet argues that repeat entrepreneurs engage in a constrained, systematic search when they discover opportunities. In an experiment, Fiet and Patel (2008) found individuals in the alertness group found 35 ideas of which one was high potential, whereas the group using constricted, systematic search identified 24 ideas of which nine were high in wealth-generating potential.

Fiet (2002, 2007) argues that specific knowledge (knowledge about people, places, technology, timing, and special conditions), which is a subset of prior experience and which is also seen as practical intelligence (Baum et al. 2009), is the basis for active opportunity discovery. In effect, opportunity discovering behaviors of repeat entrepreneurs are focused intentional acquisition and use of specific knowledge. These “behaviors” would include selection, identification, choice, specification, interpretation, revision, and interaction with other people.² These behaviors are evident in the opportunity discovery process as follows: First, based on the entrepreneur’s prior specific knowledge, the entrepreneur selects information channels. An information channel is a relatively low-cost source of new specific information capable of directing the entrepreneur’s attention toward opportunity discovery based on what and whom they know already. The search is thus actively constrained by the entrepreneur’s prior knowledge and choice of information channels. Second, after choosing the information channels, the entrepreneur clusters the information channels into consideration sets to maximize results. A consideration

²Other than interaction with others, these behaviors may or may not be observable. As stated, they are lacking specificity we recommend.

set is a group of information channels that hold promise to be helpful for the entrepreneur to locate opportunity. Third, from the consideration sets the entrepreneur searches for signals (new information that provides view of the future, especially as it relates to new venture creation and wealth generation) that the entrepreneur interprets as the existence of an opportunity.

While constrained, systematic search for opportunity discovery is illustrated above for the individual; it is also applicable to teams. Actually, it may justify why entrepreneurial teams outperform ventures created by an individual (Baum and Silverman 2004; Chandler and Hanks 1998; Schjoedt 2009; Schjoedt and Kraus 2009). The benefits of team search for opportunity are based on team diversity expanding the number of information channels that comprise the consideration sets. This may also explain why shared leadership and intra-team communication (e.g., debate) enhance venture performance (Ensley et al. 2006a).

Clearly more refinement on opportunity search behaviors could help expand the knowledge and usefulness of entrepreneurial behavior. Search behaviors must necessarily include some communication behaviors (e.g., listening and reading). How is search behavior different from communication behavior? What methods and sources of search are used, how frequently, and in what order? While constrained by existing knowledge, do differences exist in systematic search behavior across industries? Are search behaviors different at different times in industry development? These and other research questions warrant our further attention.

23.5 Concluding Remarks

One cannot think one's way to creating a new venture. Actions in the form of concrete behaviors are necessary for new venture creation and organizational birth. Thus for the field of entrepreneurship research to provide valuable contributions to entrepreneurs, educators, and society, advances in the area of entrepreneurial behavior are critical. While 12% of the articles published in two top entrepreneurship journals—*Entrepreneurship Theory and Practice* and *Journal of Business Venturing*—over a 3-year period (2005–2007) addressed entrepreneurial behavior, more can be done to clarify what entrepreneurs do to enact their intentions. Greater specificity of behaviors will benefit our research and teaching.

With this chapter, we offered five behaviorally anchored research areas—leadership, communication, behavioral roles, and two less behavioral but critically important areas—creativity and opportunity discovery. These areas have scholars, research, and methods (organizational behavior, sociology, and behavioral psychology), which may be adapted and joined to our specific domain. In doing this, we emphasize three critical issues. First, entrepreneurial behavior consists of *discrete units of action that can be observed by others*—they are visible, auditory, and/or kinesthetic and if others are present, social or potentially interpersonal in nature—they are “sized” to be meaningful. However, today many of the “behaviors” considered in entrepreneurship research are not discrete but complex and often ill defined as

they are broad and unspecific in nature (e.g., initiating investor relationships, preparing a business plan, articulating a business idea).

Second, we need to develop our own agreed-upon set of core behaviors and from this develop psychometrically sound empirical tools (similar to the work on leadership). Entrepreneurial behavior may be inherently more complex or multidimensional than the leadership in extant organizations that has been well measured and which spawned the situational and contingency approaches. Entrepreneurs face a process and stage of organization phenomena that may require different behaviors. However, if we begin with a manageable context such as start-up and nascent ventures, we stand a chance to accomplish our equivalent Entrepreneurial Behavior Description Questionnaire. A common core of behavioral constructs, if not measures, would allow theories of and empirical research on entrepreneurial behavior to accumulate. From this, we could also advance observational studies of entrepreneurial teams, role taking, communication, and creativity of individuals and teams as well as opening other fertile areas for research.

Third, however we measure behavior we need to do so more rigorously than the current state of the field. Single-item measures and self-reports need to be supplemented with methods drawn from the other disciplines of organizational behavior, sociology, and behavioral psychology. Minimally we need to control for social desirability bias. More innovatively, we could do behavioral sampling (beeper or diary studies), laboratory and field experiments (or quasi experiments) where behavior is a specified variable.

In sum, we call for more studies and better operationalizations of entrepreneurial behavior. We also caution against blindly adopting models, theory, and even measures from organizational behavior, which have evolved in studies of larger, mature organizations. We have no reason a priori to expect entrepreneurs to behave as the leaders studied by the Ohio State researchers (Hemphill and Coons 1957) nor do we have any reason to suppose that there is a path-goal model to entrepreneurship such as that developed by House (1996). Likewise, the received knowledge of organizational behavior, sociology, and behavioral psychology needs to be well understood and critically applied to our domain.

Finally, if the postulates of this book are even in part true or verified, then entrepreneurial behavior broadly defined, would likely be seen in contexts that extend beyond the start-up new venture. With careful theorizing and better (general) measures of the entrepreneurial mind and entrepreneurial behavior, we might find people forming intentions, making choices and behaving entrepreneurially in a myriad of contexts including governmental agencies, non-governmental organizations, communities, families, and temporary settings such as rush hour subways, twitter collectives, singles bars, and natural disaster management.

We have to understand the world can only be grasped by action, not by contemplation. The hand is more important than the eye The hand is the cutting edge of the mind.—Jacob Bronowski

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Chapter 24

Entrepreneurs' Behavior: A Black Box in Entrepreneurship Research

Leon Schjoedt

24.1 Introduction

Entrepreneurs' behavior—the concrete enactment of attitudes, beliefs, cognitions, knowledge, learning, intentions, or skills on tasks and activities—results in outcomes; and performance is commonly understood as the combined outcomes of multiple behaviors (Bird and Schjoedt 2009; Bird et al. 2012, 2014). The entrepreneurship literature abounds with research on antecedences of behavior, such as cognition and intentions, and on outcomes of behavior, i.e., individual and venture performance. Yet, research on entrepreneurs' behavior is scarce (Bird and Schjoedt 2009; Bird et al. 2012, 2014). The scant research on entrepreneurs' behavior, despite its importance in mediating the relationship between the antecedents and outcomes of behavior in the new venture creation process, means that entrepreneurs' behavior is a black box in entrepreneurship research. This is surprising because without entrepreneurs' behavior there is no venture creation.

The limited research attention given to entrepreneurs' behavior in the literature has consequences for the contributions the entrepreneurship literature can make to society as it limits the takeaway points entrepreneurship research provides for entrepreneurs and stakeholders, such as investors, policy makers, and educators. Considering that the major goals of research on entrepreneurs' behavior are to explain, predict, and control (shape and change) behavior at the individual and team level (Bird and Schjoedt 2009; Bird et al. 2012, 2014), research on entrepreneurs' behavior has potential to make contributions beyond the academic literature to assist entrepreneurs and stakeholders in enhancing the potential for entrepreneurs to become successful and, in turn, the benefits of entrepreneurship.

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In 2009, Bird and Schjoedt provided a review of empirical research on entrepreneurs' behavior published in the two entrepreneurship journals listed on *Financial Times* top 45 academic journals, *Entrepreneurship Theory and Practice* and *Journal of Business Venturing*. They found the empirical research on entrepreneurs' behavior to be scarce. Consequently, they called for more research on entrepreneurs' behavior. The purpose of this chapter is to provide an update on the 2009 review by Bird and Schjoedt and to provide specific suggestions for future research on entrepreneurs' behavior that may shed light on the nature of entrepreneurs' behavior in the new venture creation process.

24.2 The 2009 Review on Research on Entrepreneurs' Behavior

Entrepreneurs' behavior holds a central role in the new venture creation process. It mediates the relationships between antecedents (e.g., cognition, human capital, intuitions) and consequences of behavior, such as performance. As such, entrepreneurs' behavior is about what entrepreneurs do, not about what or who they are (Gordon 2012). This elucidation shows that entrepreneurs' behavior constitutes actions that can be recorded on audio or video (Bird and Schjoedt 2009; Bird et al. 2012, 2014; Shaver 2012).

Another clarification is necessary before considering the review from 2009. Not all research is based on an entire venture creation process. Therefore, variables of entrepreneurs' behavior considered in published research may, in addition to mediating variables, be dependent or independent variables. While control variables may also be variables of entrepreneurs' behavior, they are not central to advancing the literature (Schjoedt and Bird 2014). Because studies with entrepreneurs' behavior as control variables were included in the review by Bird and Schjoedt (2009), there is a need to conduct a second-order assessment of the publications considered in the review. Excluding studies in which it is not clear whether the entrepreneurs' behavior variables are dependent or independent variables or are control variables means that a second-order assessment of the published research included in the review results in 6 of the 28 published works in should not be considered. Therefore, the 22 studies including entrepreneurs' behavior as either a dependent or independent variable published in *Entrepreneurship Theory and Practice* (ETP) and *Journal Business Venturing* (JBV) accounted for less than 10% of the published research in 2005–2007.

24.2.1 The 2009 Review

Bird and Schjoedt (2009) observe that the nature of entrepreneurs' behavior by placing it centrally in the new venture creation process when stating that “entrepreneurial behavior is the proximal outcome of cognitions and emotions of entrepreneurial actors; it is the proximal individual-centric cause of venture outcomes” (p. 327).

They further clarify that in a research context entrepreneurs' behavior is the enactment of tasks and activities. For the purpose of clarification, Bird and Schjoedt observe similarity and differences among behavior and other concepts, such as action, responses, performance, ability, skills, knowledge, competence, and processes. They specifically point out that behavior is observable; whereas performance, ability, skills, knowledge, competence, and processes are derived by inference from behavior; for ability, skills, knowledge, and competence to result in behavior, motivation and opportunity must be present; and for processes to have an impact, such as new venture creation, behavior is required.

While the focus of the review by Bird and Schjoedt (2009) is empirical research, they acknowledge the scant conceptual research on entrepreneurs' behavior in the entrepreneurship literature. They acknowledge that conceptual and empirical research on entrepreneurs' behavior is also published outside the two journals, ETP and JBV, considered in the review.

The research published in 2005–2007 in ETP and JBV on entrepreneurs' behavior does not provide a coherent picture of what entrepreneurs do when they create new ventures. Only two pairs of studies have variables of interest in common. Alsos et al. (2006) examine how adding or hiring a new team member as an independent variable affects that entrepreneurial team whereas Forbes et al. (2006) examines adding or hiring a new team members as a dependent variable. Similarly, Singh and Lucas (2005) examine preparation of business plans as dependent variable while Haber and Reicheil (2007) use writing a business plan as an independent variable.

Beyond these two pairs of studies, there does not seem to be commonality among the published research on entrepreneurs' behavior in 2005–2007. The research that had behavior as an independent variable used the following variables: implied delegation, consulting with outsiders, scanning, analysis, and planning (Forbes 2005); training and development of employees, encouragement, and communication of goals (Rauch et al. 2005); receiving support (Hanlon and Saunders 2007); decision-making processes (Talaucar et al. 2005); guided preparation by advisors (Chrisman et al. 2005); transformational and transactional behaviors (Ensley et al. 2006); networking (Watson 2007); market mix planning (Gruber 2007); and activities (Lichtenstein et al. 2007).

Research that used behavior as dependent variables employed the following variables: board involvement (Fiegener 2005), applying for external capital (Orser et al. 2006), behavior sequences (DeTienne and Chandler 2007), internationalization (Cloninger and Oviatt 2007), start-up of self-employment (Kolvereid and Isaksen 2006), and bootstrapping activities (Ebben and Johnson 2006). Two studies used behavior as both independent and dependent variables: several behaviors, e.g., speaking with friends (Lichtenstein et al. 2006) and categories of activities (Tornikoski and Newbert 2007). As this shows the published research does not provide a coherent picture on entrepreneurs' behavior; or, what entrepreneurs do when creating new ventures.

In addition to finding a fragmented body of research on entrepreneurs' behavior, Bird and Schjoedt (2009) note there is a need for researchers to carefully consider molarity issues—the specificity of behaviors, a need to move beyond self-reports and

single items, and a need to include time in research in entrepreneurs' behavior. These needs are illustrated by Bird and Schjoedt observing how behaviorally anchored research has advanced knowledge on leadership, shared leadership, communication, behavioral roles, creativity, and opportunity discovery; all aspects that are relevant in entrepreneurship.

24.3 Developments Since the 2009 Review

24.3.1 *The 2010 Gateway Conference on Entrepreneurs' Behavior*

Because the review of the research on entrepreneurs' behavior published in 2005–2007 was less than uplifting, the 21st Annual Gateway Entrepreneurship Research Conference on “Behave: Specifying, Measuring, and Teaching Entrepreneur Behavior” at St. Louis University, MO, in April 2010, was organized to facilitate research on entrepreneurs' behavior. At the Gateway conference several discussions emerged of which three are noteworthy, which are addressed in more detail by Bird et al. (2014). One of these discussions centered on topics for future research on entrepreneurs' behavior. An important start-up activity, or indicator, is the first sale (Carter et al. 1996; Gartner et al. 2004). Considering the first sale sparked a discussion on selling behaviors in entrepreneurship. Bird et al. (2014) observe that there is a lack of research on entrepreneurs' selling behavior, as well as a lack of university course offerings and textbooks on entrepreneurs selling behavior while sales management courses and texts were not considered. Bird et al. (2014) also observe that the topic of entrepreneurs' selling behaviors is in need of conceptual and empirical research.

A second discussion addressed differences and similarities among the roles of entrepreneurs, managers, and leaders and how these roles overlap or are distinguishable. Bird et al. (2014) observe that entrepreneurs are distinguishable by they discover, create, and innovate (Arrow 1962; Kirzner 1997; Penrose 1959; Schumpeter 1934) while entrepreneurs and leaders, both, motivate, direct, and lead people toward goals (Cogliser and Brigham 2004; Czarniawska-Joerges and Wolff 1991; Vecchio 2003) and entrepreneurs and managers, both, reduce complexity by budgeting, activity control, and executing plans (Mintzberg 1973; Penrose 1959). Recent research also shows entrepreneurs can be distinguished into entrepreneurial leaders and entrepreneurial managers based on how they learn and how they employ their knowledge (Schjoedt and Valencia [Forthcoming](#)).

The last of the three discussions pertained to the differences and similarities between entrepreneurial behavior and entrepreneurs' behavior. The distinction is of conceptual importance. While many people considering becoming entrepreneurs, few take action to become entrepreneurs (Kolvereid 1996a, b). Entrepreneurial behavior encompasses both the mind and observable behaviors of people who creates new ventures or who entertain the idea of becoming entrepreneurs, which may

be interesting in the context of entrepreneurial intentions (Brännback et al. 2007). On the other hand, the focus of entrepreneurs' behavior is on the (observable) behaviors people engage in as they undertake activities and tasks in the process of creating new ventures (Bird and Schjoedt 2009; Bird et al. 2012, 2014). The distinction is also evident in the psychology literature in which schools of thought may be separated into behavioral and behavior. Shaver (2012) observes that a behavioral school of thought includes both latent (the mind) and observable behaviors whereas a behavior school of thought only includes observable behaviors, meaning behaviors that can be recorded on audio or video. Thus, while entrepreneurial behavior, similar to organizational behavior, covers observable and latent behaviors, such as cognition and intentions, entrepreneurs' behavior is focused on actions that can be recorded on audio or video only (Bird and Schjoedt 2009; Bird et al. 2012, 2014; Gordon 2012; Shaver 2012).

24.3.2 *The 2012 Special Issue on Entrepreneurs' Behavior*

Another development that stem from the review by Bird and Schjoedt (2009) is a special issue of *Entrepreneurship Theory and Practice* on entrepreneurs' behavior. In their peer-reviewed introduction to the special issue, Bird et al. (2012) observe that the concept of entrepreneurs' behavior is poorly defined and the cumulative research is fragmented with often ad hoc measures that lack validation. These observations are based on consideration of 91 research publications on entrepreneurs' behavior in 2004–2010 in several leading academic journals—*Academy of Management Journal*, *Administrative Science Quarterly*, *Entrepreneurship and Regional Development*, *Entrepreneurship Theory & Practice*, *Human Resource Management Review*, *Human Relations*, *Industrial and Labor Relations Review*, *Industrial Relations*, *Journal of Applied Behavioral Science*, *Journal of Applied Psychology*, *Journal of Business Venturing*, *Journal of Developmental Entrepreneurship*, *Journal of International Business Studies*, *Journal of Management*, *Journal of Management Studies*, *Journal of Occupational and Organizational Psychology*, *Journal of Organizational Behavior*, *Journal of Small Business Management*, *Journal of Vocational Behavior*, *Leadership Quarterly*, *Management Science*, *Organization Science*, *Organization Studies*, *Organizational Behavior and Human Decision Processes*, *Organizational Dynamics*, *Personnel Psychology*, *Psychological Bulletin*, *Small Business Economics*, *Strategic Entrepreneurship Journal*, and *Strategic Management Journal*. Even though the review of the 91 research studies on entrepreneurs' behavior indicates there is a lot of room for advancement of the literature on entrepreneurs' behavior, Bird et al. (2012) list several exemplars of entrepreneurs' behavior identified from the published research.

It was not surprising that the two entrepreneurship journals, ETP and JBV, considered in the 2009 review and on the *Finical Times* list of top 45 journals included more research on entrepreneurs' behavior than any other journal. Research on entrepreneurs' behavior accounted for about 10% of publications in ETP and JBV in 2004–2010.

In addition to the topics covered in the review by Bird and Schjoedt (2009), the studies on entrepreneurs' behavior published in ETP or JBV in 2004–2010 addressed the following topics: writing business plan (Brush et al. 2008; Delmar and Shane 2004; Karlsson and Honig 2009; Shane and Delmar 2004); information gathering from external sources, e.g., investors, customer, printed sources (De Clercq and Rangarajan 2008; Delmar and Shane 2004; Shane and Delmar 2004; Stewart et al. 2008; Zhang et al. 2008); location choice (Wright et al. 2008); improvisational behavior (Hmieleski and Corbett 2008); scheduling (Bluedorn and Martin 2008); and making judgment (Brundin et al. 2008; Patzelt et al. 2008). There seems to be more cohesion among entrepreneurs' behaviors considered by scholars for the studies published in 2004–2010 than in 2005–2007 only.

Bird et al. (2012) also considered how behavior was measured, and the samples and methods employed in research on entrepreneurs' behavior published in 2004–2010. They found among the research published in ETP and JBV that most research on entrepreneurs' behavior is cross-sectional in which behavior was assessed by single-item or summed binary measures. For example, several studies employed panel data from the Panel Study of Entrepreneurship Dynamics (Brush et al. 2008; Singh and Lucas 2005; Tornikoski and Newbert 2007) or the Swedish version of PSED (Delmar and Shane 2004; Shane and Delmar 2004). They found only two studies were based on an experimental design, which was conjoint analysis (Brundin et al. 2008; Patzelt et al. 2008). Most of the data were from self-reports on current or past behavior opening up for the data to be influenced by common method and social desirability bias.

In calling for additional research on entrepreneurs' behavior, Bird et al. (2012) also offer two approaches to consider in research on entrepreneurs' behavior. They address a taxonomic approach in which the focus is on types of behavior and a partonomy approach based on parts of behavior. The taxonomic approach assist by classifying behaviors based on similarity. This approach has been successfully used in studies on leader behavior (Stogdill and Coons 1957), work tasks (Fleishman 1982), and supervisory behavior (Komaki et al. 1986). The partonomy approach assists in consideration of what parts make up behavior and how smaller parts of behavior are combined into a larger behavior. For example, how combinations of micro behavior, like bending fingers, make up the behavior of holding a tool, like a glass. In other words, how a smaller or larger behavior fits into a hierarchy of behavior (Vallacher and Wegner 1987; Zacks 2004; Zacks and Tversky 2001).

24.3.3 Research on Entrepreneurs' Behavior: 2011–2014

On the surface it seems that little has changed in the research on entrepreneurs' behavior published in ETP and JBV in 2011–2014. However, more careful considerations reveal positive developments in research on entrepreneurs' behavior even though the amount of research on entrepreneurs' behavior has declined. As observed earlier, during 2004–2010 about 10% of published research in ETP and JBV addressed entrepreneurs' behavior. However, in 2011–2014 published research on

entrepreneurs' behavior declined to less than 3% resulting in about 6% of research published research in ETP and JBV in 2004–2014 addressed entrepreneurs' behavior. If the five articles from the special issue on entrepreneurs' behavior published in 2012 are excluded from consideration, it means that less than 2% of the research published in 2011–2014 address entrepreneurs' behavior.

At first sight it appears that research on entrepreneurs' behavior remains fragmented in terms of providing a coherent picture of what entrepreneurs do when creating new ventures. After more detailed consideration, there seems to be four themes among the research published in 2011–2014: effectuation, launch activities, impression management, and legitimacy. Three studies address effectuation: Chandler et al. (2011) develop and validate scale on effectuation and causation; Fisher (2012) provides a behavioral comparison of effectuation, causation, and bricolage; and Fischer and Reuber (2011) examine use of Tweeter and effectuation. Another theme addressing activities related to launching a new venture consist of research published by Farmer et al. (2011), Katre and Salipante (2012), Kreiser et al. (2013), and Mueller et al. (2012). Another three studies address impression management, directly or indirectly: Ebbers (2014) address networking behaviors among participants in business incubators; Maxwell and Levesque (2014) examine trust building with investors; and Nagy et al. (2012) examine the effect of impression management behaviors on new venture legitimacy. Legitimacy, the fourth theme, was examined in research publications by Nagy et al. (2012), Pollack et al. (2012), and Sutter et al. (2013). Although the four themes do not seem to provide a more holistic picture of what entrepreneurs do when they create new ventures, the four themes in the published research indicate that there is more coherence among the published research in 2011–2014 than previously. This is a positive development as it holds potential to provide a basis for the development of a taxonomy and a partonomy of entrepreneurs' behavior and, as such, holds potential to collectively advance the literature on entrepreneurs' behavior (Bird et al. 2012).

Also on the positive side, there seem to be a trend among the 12 published studies on entrepreneurs' behavior in 2011–2014. There seems to be a departure away from reliance on self-reports, such as used by Ebbers (2014) and Farmer et al. (2011), and on panel data, such as the PSED data that were used by Kreiser et al. (2013); in favor of experiential research designs (Nagy et al. 2012) and qualitative research (Fisher 2012; Katre and Salipante 2012; Sutter et al. 2013) including observations (Maxwell and Levesque 2014; Mueller et al. 2012; Pollack et al. 2012). Another positive aspect is the development and validation of scales to assess entrepreneurs' behavior as provided by Chandler et al. (2011).

Considering that ETP and JBV are leading entrepreneurship journals—they are the two entrepreneurship journals listed on *Financial Times* list of top 45 journals used to rank business school research and that ETP and JBV published more research on entrepreneurs' behavior than other journals included in the review by Bird et al. (2012), the dismal statistics regarding the amount of published research on entrepreneurs' behavior in the two journals indicates that research on entrepreneurs' behavior is scant and as a body of research it is fragmented; or, in other words, that entrepreneurs' behavior is the black box of entrepreneurship research.

Recall that research on entrepreneurs' behavior holds great potential to explain, predict, and control (shape and change) entrepreneurs' behavior (Bird and Schjoedt 2009; Bird et al. 2012, 2014). As such, research on entrepreneurs' behavior holds potential to provide clear takeaway points that can assist entrepreneurs improve their odds of becoming successful and, in turn, improve other entrepreneurship stakeholders' outcomes. The importance of entrepreneurs' behavior in the new venture creation process and dismal state of the research literature on entrepreneurs' behavior indicates there is a need for more research on entrepreneurs' behavior. There is a need for (more) exploratory research to understand the phenomenon of entrepreneurs' behavior. This may mean a departure from the more traditional methods in studying entrepreneurs' behavior; maybe it is time to further the trend that seems to have begun by pursuing inductive research to develop an appreciation of entrepreneurs' behavior; what entrepreneurs do when they create new ventures.

24.4 Suggestions for Future Research

One challenge faced when searching for research on entrepreneurs' behavior is that the terms action and behavior are used for research on antecedents of behavior, such as cognition or intuitions, which means the researchers address entrepreneurial behavior (the mind), not the observable behavior of entrepreneurs creating new ventures. Further, in many studies that on entrepreneurial behavior, the dependent variable is not observable behavior (or action); dependent variable is an antecedent of observable behavior, e.g., cognition and intentions. Thus, there is a need for researchers to carefully define and conceptualize behavior studied.

In studies that address observable behavior there is also a need for clarity regarding the observable behavior. Several studies used the PSED data on the start-up activities observed by Carter et al. (1996) and Gartner et al. (2004). Some of these behaviors have limited specificity; for example, it is not clear what it means when entrepreneurs "defined market opportunities." This indicates that the behavior considered lack specificity to such a degree that the behavior considered is, in effect, a group of behaviors, not a specific observable behavior. Another reason for identification of specific behavior is evident from a study on entrepreneurs' goal striving by Schjoedt et al. (2015). These scholars found that smaller and more specific goals resulted in action and, in turn, goal accomplishment. The results also showed that a high number of small and actionable goals resulted in a venture launch relative to entrepreneurs who pursued less specific, higher level goals, like write a business plan. This is consistent with the observations that a need exists for the development of a taxonomy of entrepreneurs' behavior and a partonomy of entrepreneurs' behavior (Bird et al. 2012). Such taxonomy and partonomy will provide opportunity for researchers to examine entrepreneurs' behavior that is meaningful in terms of type and molarity.

For research on entrepreneurs' behavior to advance the literature and provide takeaway points for stakeholders, the behavior also needs to be generalizable and rooted in entrepreneurs' actual behavior, not behavior that is a priori selected or based on the data at hand. Two approaches seem appropriate for identification of entrepreneurs' behavior that is meaningful and generalizable and that holds potential for a taxonomy and partonomy of entrepreneurs' behavior. The first of these two approaches is to use theories from other domains to enhance research on entrepreneurs' behavior. For example, a taxonomy from the personality literature, the Big Five Personality Factors (e.g., Digman 1990), has proven successful in entrepreneurship research to categorize personality traits used in entrepreneurship research into the Big Five Personality Factors that provided a basis for distinguishing between entrepreneurs and managers (Zhao and Seibert 2006). Research on communication styles in selling (Snader 1984; Withey and Panitz 1995), negotiation (Pruitt 1981; Raiffa 1982; Thomas 1992), and impression management (Cialdini 2001) could benefit research on entrepreneurs' behavior by providing basis for taxonomy, partonomy, molarity, generalizable, and meaningful behavior of entrepreneurs.

The second of the two approaches to identify entrepreneurs' behavior that is inductive research. Grounded theory (Glaser and Strauss 1967) holds potential for analyzing qualitative data to identify and to develop taxonomy, partonomy, and molarity of entrepreneurs' behavior. Such data analysis could be combined with theories of other domains to structure the entrepreneurs' behavior identified. The rich data needed for inductive research could be obtained in several ways, e.g., dialog, diaries, observations. Dialog was employed by Steyaert (1995) to understand entrepreneurs and entrepreneurship. Learning journals were used by Schjoedt et al. (2015) to examine entrepreneurs' goal striving. Observation was used by Mintzberg (1973) to determine what managers do and by Baker (1993) to understand how team members' behavior influenced team performance.

As noted in the review of recent research published in ETP and JBV (in 2011–2014) on entrepreneurs' behavior, there seems to be a budding trend of inductive research to enhance understanding of entrepreneurs' behavior. One example is provided by Maxwell and Levesque (2014). These scholars used real-time data gathering with behaviors as the key data unit in their study of how entrepreneurs build, damage, or violate trust with business angels. It seems there is an acknowledgment among scholars of the importance of entrepreneurs' behavior in entrepreneurship research and of a need for a different approach to studying entrepreneurs' behavior than has traditionally been used in entrepreneurship research. Since entrepreneurs' behavior is presently a black box in entrepreneurship research, there is a need for more research on entrepreneurs' behavior to develop an understanding of what entrepreneurs do when they create new ventures and to provide clear takeaway points for entrepreneurs, educators, and other stakeholders of entrepreneurship. The two approaches outlined provide opportunity for researchers to continue and build on the promising research trend to enlighten stakeholders, e.g., entrepreneurs, educators, policy makers, advisors, and researchers, on entrepreneurs' behavior.

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ERRATUM TO

Revisiting the Entrepreneurial Mind

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An error in the production process unfortunately led to publication of this book in which Chapter 7 and Chapter 14 were transposed. Revisiting a Contextual Model of Entrepreneurial Intentions should be Chapter 7 and Motivations Matter in Entrepreneurial Behavior: Depends on the Context should be Chapter 14.

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