Chapter 8
DECISION-MAKING MODELS AND CAREER GUIDANCE

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Career-related choices are among the most important decisions people make during their lifetime. These choices have significant long-term implications for individuals' lifestyles, emotional welfare, economic and social status, as well as their sense of personal productivity and contribution to society. Therefore, it is only natural that individuals at different stages of their lives are preoccupied with career choices (e.g., Campbell & Cellini, 1981; Gati, Saka, & Krausz, 2001; Super, 1980). Moreover, although almost all people make career choices, many people face difficulties in this area (e.g., Amir, Gati, & Kleiman, 2008; Osipow, 1999; Rounds & Tinsley, 1984; Tinsley, 1992).

Although it seems natural to refer to career choices as acts of decision-making, and therefore to examine and analyse them in terms of decision theories, this approach has not been adopted as the dominant framework for career guidance and counselling, for reasons discussed below. Rather, other theoretical approaches dominate the field: (a) career development theories (e.g., Ginzberg, Ginsburg, Axelrad, & Herma, 1951; Gottfredson, 1981; Mitchell & Krumboltz, 1990; Roe, 1956; Savickas, 2005; Super, 1972, 1990), which tend to focus on the developmental circumstances in which decisions are made, including changes that occur in the individual's preferences, career maturity and adaptability, and the effects of these changes on the career decision, and (b) the Person-Environment Fit (P-E Fit) approach (e.g., Dawis & Lofquist, 1984; Holland, 1997), which typically focuses on the congruence between individuals and their environment, that is, on the *outcomes* of the decision-making process.

This chapter explores some of the shortcomings of these two approaches, namely, the lack of reference to the essence of the career decision-making *process*, and suggests ways of addressing these shortcomings by conceptualising career decision making from a decision-theory perspective. It is suggested to adopt the view that the goal of career guidance and counselling is helping clients make better career decisions. To achieve this goal, a theory that focuses on understanding the

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processes involved is essential. This chapter shows the practical importance of designing procedures for making career decisions in *specific* situations requiring choices among alternatives along the developmental continuum described by career-development theories, and demonstrates how the goal of making adequate career choices (that is expected to lead to high person-environment congruence) can be better achieved by using a systematic decision-making model.

Furthermore, the complexities of the twenty-first century's world of work, and the constant changes that characterise it, turn careers into multi-decisional, unpredictable, and unstable paths (Blustein, 2006; Bright & Pryor, 2005; Gelatt, 1989; Krieshok, Black, & McKay, 2006; Mitchell, Levin, & Krumboltz, 1999; Savickas, 2000, 2005; Van Esbroeck, Tibos, & Zaman, 2005). Hence, the empowerment of individuals as autonomous decision-makers is necessary for their career development, and requires that career counsellors help them acquire decision-making skills. By adopting decision theory, after adapting it to the unique features of career decisions, researchers can transform theoretical knowledge into practical interventions, providing career counsellors with tools for assisting deliberating individuals in carrying out the career-decision-making process actively and efficiently.

Indeed, decision theory has been reviewed and recognised as a potential frame of reference for career-decision-making for almost half a century (e.g., Brown, 1990; Gelatt, 1962; Jepsen & Dilley, 1974; Kaldor & Zytowski, 1969; Katz, 1966; Mitchell & Krumboltz, 1984; Pitz & Harren, 1980; Sauermann, 2005). Nevertheless, these theoretical discussions and conceptualisations have rarely been translated into specific practices aimed at guiding counselees towards making effective decisions. Hence, one of the goals of this chapter is to contribute to the continuous dialogue between decision theories and the actual needs of counselees as they emerge from career counsellors' experience.

The first section of this chapter focuses on the unique features of career decisions, highlighting the characteristics of the twenty-first-century world of work and its effect on the complexity of the process and the challenges involved in it. The second section briefly reviews traditional decision-making theories, with their advantages and disadvantages. It is suggested that one of the reasons that decision theory has not been embraced as a framework for career-decision-making research and guidance is that normative decision-making models, which were dominant in decision theories for many decades, are overly rational, as well as too abstract to be applicable to actual, real-life career-decision-making. In the third section it is therefore suggested to adopt prescriptive decision-making models, which minimise the disadvantages and maximise the advantages of decision theory, as a framework for facilitating the career-decision-making process. Then the PIC model (Prescreening, In-depth exploration, and Choice; Gati & Asher, 2001a) is presented to demonstrate the applicability and potential benefit of prescriptive models. The last section addresses the often-heard criticism of decision theories as "too cognitive" by discussing the role of non-cognitive factors in career-decision-making and career guidance. The chapter is concluded by exploring the implications of decision theories for career guidance and counselling.

The Unique Features of Career Decision Making

Decision theories are applicable to situations that are characterised by: (a) an individual who has to make the decision, (b) a set of objectives the individual seeks to achieve, (c) a set of alternatives to choose from, (d) a set of attributes and factors that the individual takes into account when comparing the alternatives, and (e) the necessity of collecting and processing information (often under conditions of uncertainty). Not surprisingly, these features also characterise most career-decision situations (Gati, 1986; Gati & Asher, 2001a; Katz, 1966; Pitz & Harren, 1980). Harren (1979, p. 119) defined a decision-making model as "a description of a psychological process in which one organises information, deliberates among alternatives, and makes a commitment to a course of action." This definition reflects the cognitive, analytical nature of decision models that stands at the focus of this chapter. Nevertheless, the importance of intuition, as well as emotional and personality-related facets of career-decision-making, for arriving at a satisfying and confident choice, has been acknowledged, and much research is now devoted to understanding the importance of these factors for the decision process (e.g., Saka, Gati, & Kelly, 2008), as is explored and elaborated in the last section of this chapter.

From the cognitive viewpoint, decision situations differ in many ways, including: (a) the importance of the decision, (b) the information needed for the decision, and (c) the type of information processing required. This section discusses these characteristics as they bear on career decisions. Characterising the unique features of career choices is of major interest because they contribute to the complexity of this type of decisions and the difficulties involved in making it. These features are also likely to affect the ways these decisions can be facilitated.

The Importance of the Decision

When people make important decisions (e.g., to purchase either a suburban house or a downtown apartment), the consequences associated with the various alternatives may vary significantly, in contrast to relatively small variance of the consequences of the considered alternatives of less-important decisions (e.g., dressing to work in either a blue or a brown shirt). On this continuum, career decisions may be found at one pole, as most career choices affect several aspects of life, including aspects that are not directly related to one's work environment, such as the individuals' relations with significant others, their social surroundings, and so forth.

Post-modern Western culture's emphasis on values such as self-fulfilment and personal satisfaction increases individuals' awareness of the impact of their choices on their general well-being. Similarly, Savickas (2000) referred to the post-modern world of work as a framework for personal meaning-making and self-management.

Finally, the consequences of making an inappropriate career decision may be significant, both financially (e.g., one's investment in the training) and psychologically (e.g., the difficulty of making a change in a significant aspect of one's life and the frustration deriving from an unsatisfying job). Hence, it is not surprising that career-decision-making can become a stressful process for many people, and is often associated with increased levels of anxiety.

The Information Needed for Career Decisions

Information on Career Alternatives

The most prominent characteristic of career choices in today's world of work is the variety of career alternatives from which one can choose. In the twenty-first century, career choice is a lifelong process with many steps and numerous transitions, which are not necessarily focused on a specific goal, but rather on coping with unpredictable changes and opportunities (Blustein, 2006; Bright & Pryor, 2005; Krieshok et al., 2006; Savickas, 2000; Van Esbroeck et al., 2005). While the P-E Fit approach focuses on the fairly static congruence between individuals and their jobs (the outcome of the match), the modern career world requires recognition of the dynamic nature of career decisions (Bright & Pryor, 2005). Therefore, instead of the traditional linear, progressive image of a career path, the post-modern career path can be described as a path with many forks, each offering multiple directions to be considered.

On the one hand, the variety of occupations and jobs gives individuals the freedom to look for the alternative most suitable to their preferences, interests, and abilities, but, on the other, the large number of alternatives and the unpredictability of the changes in the work environment increase the complexity of the decision. Schwartz (2004) described the above paradox as "sometimes more is less". He reviewed studies demonstrating that people are cognitively unable to narrow down a multitude of options by ignoring the surplus alternatives on the list. Thus, instead of benefiting from the abundance of options, they face an overload of choice, requiring high cognitive abilities and a vast investment of effort (Schwartz, 2004).

The large number of potential career alternatives, the nuances distinguishing them, and the frequent changes they undergo require the deliberating individual to collect a vast amount of information on many alternatives. The challenge of dealing with this overload of information is compounded by the within-occupation variance – namely, the significant variations in the attributes of particular jobs in the same occupation. For example, a marketing expert can work at an office analysing consumer markets, or travel and meet customers face to face. Organisational characteristics (e.g., organisational culture) can also significantly affect the characteristics of a specific job (Sauermann, 2005). In addition, most occupational information is "soft" – subjective, vague, and difficult to define or quantify (e.g., the level of prestige of a given occupation or job). The ongoing changes in the world of work, as

well as modifications in the individual's preferences, increase the uncertainty involved in the subjective meaning attributed to the information by the individual (Gelatt, 1989). Finally, the various sources of information (e.g., television, Internet) differ significantly in quality and credibility, which further increases the complexity of using the information.

Information About the Individual's Preferences and Abilities

The aim of career-decision-making is to locate the alternative that best matches the individual's goals and characteristics. Therefore, in addition to collecting occupational information, the process also requires people to clarify and explicate their preferences and capabilities. Defining one's preferences is a challenging task which poses a significant difficulty to many deliberating individuals (Gati, Krausz, & Osipow, 1996b). From a career-counselling perspective, it requires the counsellor to first choose among competing theoretical models describing different ways of conceptualising preferences. Among the terms used for this purpose are vocational interests (e.g., Savickas, 1999), personality types (e.g., Holland, 1997), work values (Katz, 1966; Zytowski, 1970), needs (Dawis & Lofquist, 1984), and career-related or work-aspect preferences (Gati, 1986; Pryor, 1981).

Lack of information about the self, or the difficulty in clarifying one's preferences, is not merely a theoretical issue but one of the major causes of career indecision (Gati et al., 1996b). Unlike occupational information, which can be obtained by exploring the environment, clarifying the individual's career-related preferences requires intensive introspection, and it is rare that individuals begin their career-decision process with a set of well-defined and crystallised career preferences. Indeed, one of the major challenges of career counselling is to help clients define their preferences (Mitchell et al., 1999; Osipow, 1999) by transforming past experiences (successes and failures, satisfying and frustrating experiences) into specific preferences (or dislikes) for work-relevant activities and a self-understanding of one's skills, capacities, interests, and values (Van Esbroeck et al., 2005). Self-exploration is a life-long activity that requires individuals to engage in active experiences through which they develop vocational and self-schemas (Krieshok et al., 2006), thus becoming better informed decision-makers.

Finally, relying on the individual's preferences in the decision-making process is based on the assumption that these preferences are stable and coherent. However, people typically do not have a stable set of dispositions and personality styles, but rather a dynamic, variable system of preferences, interests, values, and beliefs, leading to changes in one's occupational aspirations at different stages of life. Furthermore, people's preferences are constructed at least to some extent, and are highly influenced by situational components (Payne, Bettman, & Johnson, 1993), including the means used for eliciting interests (Crites, 1969) and preferences (Payne, Bettman, & Schkade, 1999).

Sauermann (2005) suggested that individuals' articulated preferences consist of three components (based on Payne et al., 1999): (a) the relatively stable preferences

of the individual, named *core preferences*, (b) the *situational components*, which are the systematic effects of specific contexts on expressed preferences, and (c) *random error*, which can also affect expressed preferences. Although much research on career choices is focused on the first category – core preferences – there is evidence that the situational construction of preferences may also have significant effects on career decisions (see Sauermann, 2005, for an extended discussion).

Acknowledging possible changes in individuals' preferences over time, career-decision theories regard career choices as a series of decisions rather than a one-time classification of the individual into one or more personality types, as is typically done in most P-E Fit models. Thus, while P-E Fit models typically focus on a rather static interest-based match, career decision-making models provide the deliberating individuals with tools for finding the best matches for them at different decision situations in life.

Contextual Factors

Contextual variables can influence individuals' career decisions by shaping their vocational preferences or by impacting on occupational information available for them. Social-learning approaches to career-decision-making emphasise the importance of social variables in shaping one's occupational preferences, as well as limiting one's career opportunities (Krumboltz, 1979). According to Krumboltz's instrumental learning model, individuals learn by noticing the positive or negative consequences generated from their actions, and hence their self-perception and preferences are dependent on the experiences, information, and feedback provided by their societal surroundings (Mitchell & Krumboltz, 1984). Indeed, social constructionism and psychological constructivism have been widely recognised and emphasised in recent career theories (see Chapter 6).

Bright, Pryor, Wilkenfeld, and Earl (2005) demonstrated that four distinct categories capture the factors perceived by individuals as highly influential in their career decisions: media, teachers, family and friends, and unplanned chance events. Their findings support the claim that both proximal and distal contextual factors influence individuals' career decisions. Among the influences of the broader societal setting to which one belongs are social stigmas and biases, which can be a source of perceived and actual social constraints on the individual's career choice. For example, research shows that stereotypic gender roles are still reflected in the differences between the career choices of women and men (e.g., Anker, 1998, 2001; Badgett & Folbre, 2001; Gottfredson, 1981).

On the immediate environment level, significant others (e.g., nuclear family, friends) also have an important impact on the individuals' career choices (Phillips, Christopher-Sisk, & Grauino, 2001). Significant others are the main providers of information for adolescents and young adults regarding occupations in general and specific jobs in particular. The information they contribute may further the decision-making process, but it may also be selective, based on a limited variety of occupations and jobs. This may affect the shaping of the individual's occupational preferences,

and increase the tendency for remaining in one's original socio-economic status (Sauermann, 2005). In some cases, significant others pressure the individual into choosing a certain occupation they think is best (Phillips et al., 2001). In other cases, however, the deliberating individuals themselves might have an excessive need for others' approval, and actively look for their input and guidance in the decision-making process (Sauermann, 2005). This factor highlights the importance of personality variables (e.g., self-efficacy) in career decision-making (Walsh, 2004).

The Nature of the Information Processing Required

Obtaining relevant information is the first step towards making a career-related decision. The next step, processing the information (termed "true reasoning" by Parsons, 1909), is a complex task as well, and a source of difficulty for many deliberating individuals (Amir et al., 2008; Kleiman & Gati, 2004). Increasing evidence indicates that individuals' cognitive abilities for decision-making are constrained in various ways. This phenomenon, termed *bounded rationality* (Simon, 1981, 1990), refers to human beings' limited ability to solve problems, which is manifested in their ability to solve only one problem at a time and process only a limited amount of information, thus leading to perceiving and processing information selectively and in a biased manner (e.g., Kahneman & Tversky, 1984; Tversky & Kahneman, 1974, 1981). These cognitive limitations have a significant effect on the individual's functioning as a decision-maker, especially in complex decision situations (Bendor, 2004), as most career decisions.

One source of complexity involves the process of comparing alternatives, and stems from people's difficulty in characterising occupations. Since occupational alternatives can be characterised along numerous attributes (e.g., level of income, level of physical activity, mathematical ability required, level of independence), and so can the individual's preferences, comparing the alternatives and judging their compatibility with the individual's characteristics is a cognitively demanding task. Decision theories facilitate the task by dividing it into well-defined, concrete steps.

Models of Decision Making

Career choice has often been referred to as a continuous developmental process (e.g., Osipow & Fitzgerald, 1996). Career development theories have tended to focus on the developmental changes in the individual's preferences, self-efficacy perceptions, and decision-skills that occur between decision tasks, and less on the actual processes involved in making a career decision. Career-decision-making models focus on specific decision points along the developmental continuum, providing a well-defined framework for decision-making that can fit any relevant situation. From this perspective, the outcomes of previous decisions and the developmental changes are among the inputs to future decisions.

General decision-theory-based models have been adapted to the unique features of career choices on the basis of the assumption that disassembling the complex decision problem into its basic components enables the individual to focus on each component separately and thus to respond more adequately, leading to a better choice (Pitz & Harren, 1980). Three types of decision-making models have been proposed for this purpose: normative, descriptive, and prescriptive models (Bell, Raiffa, & Tversky, 1988). In this section, the advantages and disadvantages of each type will be discussed in details, suggesting that the inapplicability of the normative models and the perceived lack of relevance of the descriptive ones have been the major reasons for the lack of interest in embracing them as guidelines for career guidance and counselling. However, the third type of decision-making models – the prescriptive models (which have emerged only recently) – circumvent and minimise many of these weaknesses, and hence can serve as a useful framework for decision counselling, leading to better career decision making.

Normative Models

Normative models of decision-making are aimed at developing procedures for making optimal choices. Normative models are based on evaluating each possible alternative according to two variables. The first one is the *subjective utility* (i.e., the value) of the outcomes associated with each alternative in terms of the expected benefits and costs attributed to it in line with the individual's goals and preferences. The second variable taken into account is the estimated *probability* that choosing a specific course of action will lead to a certain outcome (Brown, 1990; Mitchell & Krumboltz, 1984; Pitz & Harren, 1980). Different procedures are used for estimating these two variables and aggregating these estimates to locate the alternative with the highest expected utility. The different procedures share the assumption that the advantages of an alternative can compensate for its disadvantages, a trade-off that led to labelling these models "compensatory models" (e.g., Katz, 1966; Pitz & Harren, 1980; Zakay & Barak, 1984).

There are two widespread compensatory models (Mitchell & Krumboltz, 1984; Pitz & Harren, 1980; Sauermann, 2005). In the Weighted Additive Model, or Multi-Attribute Utility Theory (MAUT), an importance weight is assigned to each of the attributes characterising the different alternatives. The sum of the products of the weights multiplied by the utilities of the attributes represents the overall value of the alternative. In the Subjective Expected Utility (SEU) model, the utilities associated with the alternatives are weighted by the probabilities of achieving these utilities, so as to locate the most rewarding alternative.

Normative models entail not only mathematical assumptions but also significant philosophical and psychological assumptions regarding human nature. Specifically, normative models are based on the assumption that human beings are perfectly rational decision-makers: striving for the most beneficial alternative, they possess all information relevant to the decision, and are capable of considering all possible outcomes of

the choice, estimating the value of each alternative, and aggregating these values into a composite variable. However, empirical evidence of bounded rationality demonstrates that these assumptions typically do not hold. When the number of potential alternatives is large (as is the case in many career decision-making situations), normative models require collecting extensive information and making many computations, and thus are not intuitively appealing and in fact are inapplicable without a computerised system and database (Janis & Mann, 1977; Pitz & Harren, 1980).

Furthermore, when it comes to important decisions, not everything can be compensated for. For example, individuals who believe that they have no artistic talent will be unlikely to want to become an artist even if all the other characteristics of the occupation perfectly match their preferences (e.g., independence, flexible hours, prestige, etc.). Indeed, there is evidence that people find making explicit tradeoffs emotionally uncomfortable (Hogarth, 1987). Finally, assumptions that are critical for the validity of the computation outcomes (e.g., independence among the attributes used for comparing the alternatives) are often violated (Gati & Asher, 2001a). Therefore, normative models can serve as a reference point for the perfect theoretical decision process, but are irrelevant for everyday decisions as well as for effective decision counselling. Indeed, one of the major reasons counsellors often avoid using decision models is the difficulty of applying these models, demanding time and effort to master the mathematical calculations involved in them (Mitchell & Krumboltz, 1984).

Descriptive Models

A second type of decision theory-based models, *descriptive models*, investigates the ways people actually make decisions, and the gaps between the ideal, normative decision-making procedure and actual decision-making processes in real-life situations. Considering the various types of decisions people make, and the great individual differences in the ways people make decisions, it is not surprising that there is no single, generally-agreed-upon theory for describing the ways people actually make decisions. Instead, various findings have emerged from different studies, shedding light on the principles that guide everyday human decision-making.

Herbert Simon (1955) was granted the Nobel Prize for his *satisficing* theory, which refuted the basic criterion for rational decision-making: the assumption that people strive for maximisation (i.e., selecting the best option). According to Simon, maximisation requires complex information processing, which individuals' mental resources cannot cope with. Therefore, people often settle for an alternative that is "good enough", in a sense that it meets or exceeds their threshold requirements in the factors most important to them. Simon suggested that people consider their alternatives one at a time, and choose the first that is regarded as satisficing. One implication of this strategy is that the chosen alternative, although adequate, is often not the best one. Another implication is that the chosen alternative is, to a great extent, a function of the order in which the alternatives are considered – clearly not a rational procedure for making decisions.

Interestingly, empirical evidence shows that individuals guided by maximising strategies (according to the normative models) are often less satisfied with the outcomes of their decision than satisficing-strategy users (Iyengar, Wells, & Schwartz, 2006). One explanation offered for this finding is that since individuals are cognitively unable to compare a large number of alternatives by themselves, the pursuit of the "best" alternative induces them to rely on external rather than internal standards for evaluating the alternatives. Thus, a maximiser will eventually choose an alternative with the highest objective utility (e.g., income), rather than subjective utility. An alternative explanation is that maximisation creates unrealistically high expectations, leading to a greater likelihood of disappointment and regret (Iyengar et al., 2006).

Another widely researched aspect of human decision behaviour is the consistent heuristics and biases inherent to many decision behaviours, which deviate from the normative-rationale model (e.g., Tversky & Kahneman, 1974, 1981). Montgomery (1983, 1989) proposed that one of the consistent methods people use to simplify the decision-making process is framing it as a *search for dominance*, in which one alternative can be seen as dominant over the others (i.e., it is as good as the other alternatives in some aspects and better than the others in at least one aspect). The search for a dominance structure is in fact a process of hypothesis testing, in which the dominance of a "promising alternative" is tested. If the promising alternative is found to be dominant, it is chosen and the decision process is completed. However, if the decision-maker finds that the dominance structure is violated, she will restructure the given information by neutralising, de-emphasising, or counterbalancing the disadvantage(s) found for the promising alternative so as to create a dominance structure (Montgomery, 1983, 1989).

Despite the fact that no comprehensive descriptive model has been developed to represent the different aspects of human decision behaviour, the combination of knowledge stemming from different studies is important. It reveals that people do not employ purely rational decision procedures; rather, they are subject to consistent cognitive biases that simplify complex decisions, but at the same time may lead to less than optimal choices. This knowledge is valuable because it points out the problems and biases that should be addressed in career guidance. However, because descriptive models are unable to serve as a reference point for justifiable decisions, natural decision behaviours cannot be used as a basis for adequate decision-making. This explains why descriptive decision models, like normative models, have not been embraced by either career theoreticians or career counsellors.

Prescriptive Decision Models

Although normative decision-making models outline procedures for optimal decision making, as reviewed above, they have been shown to be inapplicable due to the partial information and limited cognitive resources of people coping with decision situations. On the other hand, descriptive models, which focus on understanding the

ways people actually make decisions, reveal biases, inconsistencies and limited rationality, leading to less than optimal decisions.

Prescriptive decision models incorporate the advantages of the normative and descriptive models, while minimising or circumventing their disadvantages. They are aimed at outlining a framework for making better decisions, while acknowledging human limitations and corresponding with the intuitive ways individuals make decisions. Whereas descriptive models are evaluated by their empirical validity and normative models by their theoretical adequacy, prescriptive models are evaluated by their pragmatic value – their ability to facilitate individuals' decision-making (Bell et al., 1988). Prescriptive models give up the unattainable goal of making an optimal rational decision (maximising the expected utility; e.g., Pitz & Harren, 1980; Zakay & Barak, 1984), and aim at the realistic goal of making satisficing choices (Phillips, 1994). In the context of career decision making, the goal of prescriptive models can be summarised as providing a framework for *a systematic process* for *making better career decisions*, instead of striving for completely rational ones.

Prescriptive Models for Facilitating Career Decision Making

In order to become a useful and widespread strategy for deliberating individuals as well as career guidance counsellors, a prescriptive model should have the following desirable features. First, it should be attractive and intuitively appealing – straightforward and comprehensible. Second, it should be feasible – compatible with the counsellor's and counselee's bounded cognitive ability as well as limited resources in terms of time, financial resources, and effort. Third, it should avoid complicated calculations on the one hand, and fuzzy abstraction on the other. Fourth, the model should strive for maximal simplification and minimal effort, but at the same time minimise the potential loss resulting from a non-comprehensive search process, in terms of the gap between the expected utility of the chosen alternative and that of the optimal one. Finally, in order to satisfy the needs of different decision-makers, the prescriptive model should offer multi-level complexity, allowing each individual to modify the process so as to arrive at the level of complexity most suitable for her (e.g., focusing only on a few relevant factors to compare the alternatives, skipping steps).

Simplified versions of normative-compensatory models have been designed and adapted for comparing and evaluating career alternatives (e.g., Janis & Mann, 1977; Katz, 1966). These models can be regarded as prescriptive models, since they adjust the theoretical models for "perfect" decision-making to the practical limitations of deliberating individuals, and revise them into prescriptions that are applicable to career-decision-making, acknowledging, at least implicitly, that the decisions may not necessarily be the best ones in terms of expected utility. However, these models focus on career decisions in which the number of alternatives is small, and are therefore useful for only a limited range of decision situations or only in the advanced stages of the process, after the number of relevant alternatives has been reduced.

To demonstrate the potential usefulness of prescriptive models for facilitating career decision-making, the next section will briefly review the PIC model

(Prescreening, In-depth exploration, Choice; Gati & Asher, 2001a, 2001b). This prescriptive model encompasses the entire career-decision-making process, starting from a large number of potential career alternatives. The PIC model was designed to possess the desirable features for an applicable prescriptive model, as outlined above, by offering a systematic framework for career-decision-making that is adapted to the unique features of such decisions.

The PIC (Prescreening, In-depth Exploration, and Choice) Model

One of the major sources of the complexity involved in career decision-making is the large amount of potentially relevant information. Accordingly, one of the goals of a prescriptive model is reducing the amount of information to be collected and processed, thus helping the individual focus on the most relevant information. One way to reduce this complexity is to separate the process into distinct stages. Indeed, research indicates that when dealing with decisions that involve a large number of potential alternatives, people often intuitively separate the process into two stages: (a) screening, in which the unacceptable alternatives are screened out, and (b) choice, in which the best alternative among the remaining ones is chosen (Beach, 1993; Beach & Potter, 1992; Paquette & Kida, 1988; Potter & Beach, 1994). A similar pattern has been observed in the way deliberating individuals actually collect information required for making career decisions (Gati & Tikotzki, 1989).

Based on these findings, Gati and Asher (2001a) proposed elaborating the division into stages by separating the process of career-decision-making into three stages, each featuring different goals and strategies: (a) *Prescreening* the potential set of career alternatives based on the individual's preferences, to locate a small and thus manageable set of "promising" options; (b) *In-depth exploration* of the promising alternatives, resulting in a list of a few suitable alternatives; (c) *Choice* of the most suitable alternative, based on a detailed comparison among the suitable alternatives (Gati & Asher, 2001a). Obviously, the individual can begin the process from any of the stages of the model, according to her progress in the decision-making process. In addition, the model encourages the deliberating individual to move back and forth between the stages in order to rethink and reinforce her previous inputs, thus creating a dynamic and flexible decision process. In the following sections the rationale underlying these stages and the processes involved in each are described.

Prescreening the Alternatives

The goal of the first stage, prescreening, is to reduce the number of potential alternatives and locate a manageable set of promising alternatives (i.e., seven or less; see Miller, 1956; Gati, Kleiman, Saka, & Zakai, 2003) that deserve further, in-depth

exploration. The prescreening process suggested here is based on the elimination-by-aspects strategy (Tversky, 1972), which was shown to be compatible with the ways people actually make decisions. This model was adopted as a prescriptive framework for career decisions and, after being adapted to the unique features of career decisions, was labelled *sequential elimination* by Gati (1986).

In the sequential-elimination model, the search for promising career alternatives is based on individuals' preferences in the career-related aspects that are most important to them. The term *career-related aspects* (Gati, 1986, 1998; Pryor, 1981, 1982) refers to all variables that can be used to characterise either individuals' preferences and abilities or career alternatives (e.g., income, length of training, physical work, mathematical skills). The use of a large set of career-related aspects for prescreening provides more accurate refinement of both the individual's occupational preferences and the distinctions among occupations; it is therefore expected to lead to a better person-environment fit than one based on vocational interests alone (Gati, 1998; Gati, Fassa, & Mayer, 1998).

However, because of cognitive and material limitations, it is impractical to consider all possible aspects; hence the individual must choose a subset of aspects on which to focus. The list of important aspects that should guide the prescreening process includes objective constraints (e.g., disability), personal competencies (e.g., creativity, technical skills), and core personal preferences (see also Brown, 1990; Mitchell, 1975).

The sequential elimination process is carried out according to the rank order of the aspects' importance. The search begins with the most important aspect, continues with the aspect second in importance, and so on, until the list of remaining alternatives is short enough. Since the rank order of the chosen aspects affects the list of occupations resulting from the search, an informed, careful selection and ranking of the aspects is crucial (Gati, 1986, 1994; Katz, 1993).

Note that an aspect might be considered important because the individual prefers either a high or a low level of this aspect in her occupation. For example, the aspect "work environment" might be chosen as important either because of the individual's preference for working "only outdoors" or because the individual wants to avoid being outdoors and so prefers "only indoors". For this reason it is important to distinguish between an aspect's importance and within-aspect preferences. Each career-related aspect refers to a feature that characterises occupational alternatives to different degrees (e.g., length of training). Descriptive labels can be used to represent within-aspect qualitative variations (e.g., for "amount of travel", a great deal, a lot, somewhat, a little, hardly ever), allowing the individual to express her preferences in the particular aspect at a higher resolution.

Specifically, the proposed aspect-based approach distinguishes among three facets of the individual's preferences: (a) the importance of the aspect, (b) the level regarded as *optimal*, and (c) additional, less desirable but still *acceptable* level(s), with all other levels considered *unacceptable*. For example, an individual might think that it would be ideal to work in an artistic job, but might be willing to compromise on a job that is only "somewhat" artistic. The use of the additional acceptable levels is unique and important. First, it explicitly guides the individual to consider

his willingness to compromise in that aspect, thus directing his attention to a more realistic perspective regarding the world of work and career choice (Gati, 1993; Gati & Asher, 2001a, 2001b; Gati, Houminer, & Aviram, 1998). Considering the importance of career choices in life, many people find it difficult to consider occupational alternatives different from their image of the ideal occupation (Gati, 1993; Gati & Winer, 1987; Gottfredson, 1981). Hence, increasing people's willingness to consider compromise is an integral component of career counselling. Second, using a range of levels to elicit the individual's preferences creates a more flexible characterisation of one's aspirations, incorporating possible fluctuations over time.

Once the levels of the individual's preferences have been elicited, they can be compared to the characteristics of occupations if the same qualitative levels are used for characterising occupations. Occupations should also be characterised by a range of levels (instead of a single most representative level) to represent the within-occupation variations (e.g., variations in working in unconventional hours for a private-practice family physician vs. an emergency-room physician).

The process of sequential elimination is a within-aspect, across-alternatives search; it is conducted aspect by aspect, starting from the most important one. For each aspect, the characteristics of all potential alternatives are compared with the individual's preferences, and the incompatible alternatives are eliminated. The process is repeated for the remaining aspects (in descending order of importance) until the number of remaining "promising" alternatives is manageable. Sequential elimination is a non-compensatory decision strategy because even a small gap between the individual's preferred levels and the characteristics of the occupation in the parallel aspect is enough to eliminate an alternative; an advantage in one attribute (i.e., a match between the individual's optimal level and the most characteristic levels of the occupation) cannot compensate for a disadvantage in another (lack of overlap between the range of the individual's acceptable levels and the range of levels characterising the occupation).

Theoretically, compensatory normative models can also be used for narrowing the list of promising occupations at the prescreening stage. However, using compensatory models at this stage has several major shortcomings. First, these models are based on comparing all alternatives across all aspects; therefore, if they are applied in the prescreening stage, they will require the collection and processing of an enormous amount of information, an impossible task when dealing with a large number of career alternatives without a computerised database. Second, as discussed earlier, in important decisions such as career decisions, not all disadvantages can be compensated for. This claim was supported by a recent longitudinal study which found that the reported occupational choice satisfaction of individuals who chose an occupation recommended to them by a system based on a sequential-elimination-based search six years earlier was significantly higher than that of those whose present occupation was not included in the recommended list. Choosing an occupation from a recommended list based on a compensatory-model-based search, however, was not correlated with increased occupational choice satisfaction (Gati, Gadassi, & Shemesh, 2006).

Although sequential elimination seems adequate for the prescreening stage of career-decision-making both descriptively, empirically, and theoretically (Gati,

1986, 1996; Gati et al., 2006; Gati & Tikotzki, 1989), it is not free of shortcomings. Its major disadvantage is the risk that during the process a potentially suitable alternative might be eliminated because of a slight mismatch in a single aspect. This risk can be reduced by adding a "safety check" mechanism to the process, namely, *sensitivity analysis*. This means re-examining the implications of changes in the individual's inputs to the prescreening process (i.e., preferences) on the outcome – the list of "promising" career options. Such re-examination involves (a) rethinking and confirming the range of acceptable levels reported for each aspect ("what if…"), (b) understanding why certain alternatives considered intuitively appealing by the individual before the systematic search were eliminated during the sequential elimination process ("why not..?"), and (c) locating alternatives that were discarded due to only a small discrepancy in a single aspect and considering the possibility of compromising in the aspect that caused the elimination ("almost compatible options"). The important opportunity to re-examine and adjust the inputs to the decision process is possible only because the process has been divided into distinct stages. Normative decision-making models, as well as P-E Fit approaches, which rely on a one-step computational or matching procedure, do not allow for such an interactive, dynamic decision process, thus increasing the risk of inappropriate outcomes.

In-depth Exploration of the Promising Alternatives

The goal of this stage is to locate a few alternatives that are not only promising but indeed suitable for the individual, in two senses: first, that the alternative indeed suits the individual's preferences, and second, that the individual meets its requirements and can actualise it (Gati & Asher, 2001a). In this stage the individual changes the direction of the assessment to within-occupational exploration and across-aspects evaluation. The decision-maker "zooms in" on one promising alternative at a time, collecting additional, comprehensive information about it. In-depth exploration is mostly based on "soft", unstructured information, including verbal, pictorial, and video descriptions of the occupations (which can be found in occupational libraries, in computerised career information systems, on the Internet, or from people who actually work in the occupation).

In this stage it is important that the individual focus on the *core aspects* of the occupation, which are the crucial factors for characterising its essence (Gati, 1998; Gati, Garty, & Fassa, 1996a). For example, "physical treatment of people" and "working in shifts, at unconventional hours" are among the significant characteristics of working as a paramedic and are therefore considered the core aspects of this occupation, whereas "using verbal ability" is not an essential part of the job and therefore is not considered a core aspect.

Once the attributes of the alternative have been found suitable to the individual's preferences, the second goal of the in-depth exploration stage is to investigate the probability of actualising the occupational choice, by considering the individual's previous studies, grades, and achievements, as well as time and financial constraints,

to see if they fit the prerequisites of the occupation and its requirements for success. If an occupation does not meet one or more of the above conditions, it should be removed from the list of suitable alternatives. Consequently, the in-depth exploration stage should result in a shorter list of suitable alternatives.

Choice – Locating the Most Suitable Alternative

The in-depth exploration stage usually leaves more than one alternative, and therefore a third stage is required for choosing the most suitable alternative for the individual. However, at this stage one must be aware of the possible uncertainty involved in actualising the most preferred option. Thus, it is highly recommended that the individual not conclude the decision-process by choosing a single most suitable alternative, but rather by rank-ordering several highly suitable alternatives, so as to have a "fallback plan" if obstacles emerge in the implementation of the most suitable one.

The choice stage involves a detailed, refined comparison among the alternatives under consideration, focusing on both the differences among them and the trade-offs between the advantages and disadvantages of each one. The small number of relevant alternatives at the choice stage makes it possible and desirable to use models that aim at locating the optimal – most suitable – alternative, using compensatory-model-based estimates. Indeed, it is not surprising that the number of alternatives affects people's choice strategy; when faced with a small number of alternatives, people tend to use compensatory decision strategies, unlike the situation of facing multi-alternative decision tasks, when they prefer non-compensatory strategies (for a review, see Payne et al., 1993).

Since the alternatives under consideration at this stage are all acceptable, the compromises involved in a trade-off between the desirable and the undesirable features of the alternatives (the essence of compensation) are more subtle. In addition, since the number of alternatives under consideration is small, the decision-maker can now carry out an evaluation of each alternative across all aspects without facing an overload of information.

A number of compensatory-based models have been developed for individuals deliberating about career-related decisions, but none of them is free of shortcomings. A brief review of three of these models is presented to demonstrate their potential contributions to the choice stage, and the drawbacks of each are discussed to highlight the need to design a better procedure for this stage. Katz's (1966) adaptation of the Subjective Expected-Utility model to career decisions is an example of a more quantitative compensatory model, based on work values as representing the individual's career preferences. Despite the comprehensible systematic framework it offers, the numerical estimates required from the decision-maker and the complex sequence of calculations the model involves, some of which may appear arbitrary, decrease its appeal (Gati & Asher 2001a). In addition, the outcome indicating the "best" occupation for

the individual might be misleading, since even a small change in one aspect or the consideration of an additional aspect might change the rank order (Gati, 1986).

Janis and Mann's (1977) decisional balance sheet is an example of a qualitative compensatory model (Brown, 1990; Mitchell & Krumboltz, 1984) that may be used for comparing career alternatives. It involves listing the factors one wants to consider when evaluating an alternative, assigning qualitative labels (+ for advantage and – for disadvantage) to the characteristics of each alternative, and choosing the alternative with the highest overall evaluation. Janis and Mann's balance sheet procedure can be particularly efficient when the comparison involves more than two alternatives. On the other hand, its simplicity necessitates the omission of some significant aspects of the comparison, such as the differential importance of the various factors and differences in the size of the gaps between the desirable characteristics and the characteristic level of the alternative under consideration. Therefore, when possible, a more sophisticated procedure is recommended.

One procedure of this type is based on Montgomery's (1983, 1989) description of the *cancellation* operation, included in his *search for dominance* descriptive model described earlier in this chapter. Montgomery assumed that when a small number of alternatives characterised along multiple aspects are compared, the chance for the emergence of absolute dominance by one of the alternatives is small. To arrive at dominance, individuals use different operations, taking into account the dependency among the attributes. Specifically, attributes that the individual perceives as advantageous and as related to one another (e.g., "teaching and instructing" and "using verbal ability") are grouped and used to counterbalance an advantage of the other alternative on a different combination of attributes, which are equivalent in desirability.

Montgomery's (1989) approach can be adapted to create a systematic comparison process based on three components: (a) the resemblance among aspects within an alternative, which will be used to create a within-alternative grouping of the aspects; (b) the relative importance of each aspect to the individual (using three categories – high, medium and low); and (c) the size of the gap between the two alternatives for a specific attribute (again, divided into three categories – small, medium, and large). For example, the advantage of alternative X over Y in terms of income and economic security can be counterbalanced by the advantage of Y over X in terms of job prospects and promotion opportunities. After the decision maker cancels out combinations of aspects, the net advantages of one alternative will show that it is more suitable (Gati & Asher, 2001a).

Taking into account the dependency among the aspects, the relative importance of the aspects, and the sizes of gaps, Montgomery's (1989) search for dominance is more accurate than the balance sheet, but at the same time requires greater cognitive ability and effort, and might not be appealing or applicable to all individuals. To sum up, the limitations inherent in all three simplified compensatory models indicate that further research should investigate the utility of each and develop a more adequate systematic procedure for the choice stage.

Using the PIC Model in Career Guidance and Counselling

Despite the systematic, structured prescription for career decision-making provided by the PIC model, implementing this model is still a non-trivial task without the support of a counsellor or a computerised system. Therefore, the rationale for the model was adopted for developing an Internet-based career guidance system named Making Better Career Decisions (MBCD, Gati, 1996; *http://mbcd.intocareers.org*, retrieved July 23, 2007). MBCD supports the user during the prescreening stage and includes various options for sensitivity analysis. In addition, it includes a database with occupational descriptions (and videos) for assisting the individual at the in-depth exploration stage. The system provides continuous guidance and personal feedback based on monitoring the user's input, allowing the reported preferences to be reconsidered and revised, thus creating an interactive dialogue with the user. Because of the lack of a coherent theoretical framework for the choice stage, as described above, *MBCD* does not yet include a specific component for help at this stage.

MBCD is available today both as a self-help tool and as a tool to be used between counselling sessions at career counselling centres. In the latter case, the counsellor evaluates the client's readiness to use the system, prepares the client for it, and analyses the entire dialogue and its outcomes (all of which are included in the printed summary provided by the system) with the client. Empirical evidence has shown the effectiveness of MBCD for decreasing individuals' decision-making difficulties, promoting the career-decision-making process, and increasing the probability of greater occupational satisfaction in the future (Gati et al., 2001, 2003, 2006). The Internet is flooded with career-related self-help sites differing in quality (e.g., Grupe, 2002), so that empirical validations such as those carried out for MBCD are crucial for providing the deliberating individuals surfing those sites with the high-quality help they need. A detailed account of the ways PIC maybe applied in career counselling to facilitate individual's career-decision-making process may be found in Gati and Asher (2001b).

To sum up, the PIC model integrates descriptive models with compensatory normative models by assigning them to different stages of the decision process after appropriate adaptations, turning the complex process of career choice into a sequence of well-defined tasks resulting in a rank-order of alternatives that best fit the individual.

The basic assumption of P-E Fit approaches is that greater congruence between a person and her occupational environment will lead to greater occupational satisfaction, and therefore also to greater occupational achievements and success (e.g., Dawis & Lofquist, 1984; Holland, 1997). The decision-making framework adopts the goal of P-E Fit approach, but proposes focusing on improving the decisions made throughout life, using a systematic procedure adopted from decision theory. Since the decision process suggested in the PIC model is based on a wide set of career-related aspects rather than only vocational interests, uses a range of levels to represent both the individual's preferences and the characteristics of the occupations,

and makes it possible to re-examine one's input, the P-E fit resulting from it should lead to greater career-associated well-being than that based on a single-step-based person-occupation match.

Evaluating the Prescriptive Decision Models

When theoretical models are used for guiding career decisions, it is very important to evaluate their adequacy beyond mere empirical validation. Two approaches are particularly useful in evaluating the quality of the decisions. The first approach argues that a decision model should be evaluated according to the degree of satisfaction with the outcomes of the decision based on the model, namely, the individual's occupational choice satisfaction. The second approach claims that since an individual's eventual occupational satisfaction is affected by many unpredictable and uncontrollable factors, decision models should not be evaluated by their outcomes but rather by the quality of the process that led to these outcomes (Katz, 1979; Mitchell & Krumboltz, 1984; Phillips & Jome, 2005). Thus, the goal should not be making the right decision, but rather making the decision right.

Since prescriptive models are process-centred, a process-oriented evaluation seems to be the more adequate approach. However, assuming that the right process increases the probability of making the right choice, a comprehensive evaluation of the validity and utility of a model can involve three complementary issues: (a) Does the model facilitate and improve individuals' decision-making processes? (b) Does it lead to greater occupational satisfaction in the future? (c) Do individuals generalise the model and apply it to future career decisions? A review of the research supporting the PIC model from these three perspectives can be found in Gati and Asher (2001a).

Going Beyond the Models

The Role of Non-cognitive Factors

One of the major criticisms of decision-making models is that they over-emphasise the cognitive components of career choices, while neglecting emotional factors that play a major role in decisions of this kind. Indeed, decision theories, which emerged within the field of cognitive psychology, focus on the deliberate, conscious processes involved in making decisions. Nevertheless, non-cognitive, non-conscious, emotional aspects of career-decision-making are also considered integral to the decision process, both theoretically and in counselling practice. These factors may be manifested particularly in: (a) the role of intuition in the decision-making process; (b) the interaction between decision models and the individual's decision-making

style; and (c) the process of integrating the cognitive and the non-cognitive components in counselling interventions, regarding them as complementary rather than as competing factors. These issues are discussed in the following sections.

The Role of Intuition

One of the most controversial issues associated with career-decision-making is whether decision-making is an intuitive process or a conscious, mostly rational one. Krieshok's anti-introspective view (1998, 2001) represents the claim that most human decision-making occurs at a non-conscious level and cannot be reconstructed or reflected upon by introspection. Krieshok claimed that decision models that require individuals to articulate their preferences and values often lead to errors, confusion, and even a false description of one's preferences, thus resulting in the exploration of inappropriate alternatives during the decision process. A more efficient method for improving career decisions, according to this approach, would be collecting information through active experience, thus enriching the content on which the individuals' judgments rely and helping them become more informed decision-makers.

Gelatt (1989) stressed the unpredictability and ambiguity of the post-modern information society, claiming that they can be dealt with only if decision makers refer positively to uncertainty and demonstrate flexibility in response to change. Under circumstances of this kind, rational decision-making strategies are insufficient, and intuitive thinking is required for acting adaptively.

However, intuition and systematic exploration can be viewed as complementary rather than contradictory. Appropriate career decisions should be made actively, systematically, and consciously, yet intuition does have an important role to play in several phases of the process. Intuition affects the individuals' sensitivity to the importance of each aspect, their preferred levels in the aspect, and their willingness to compromise. Intuition can also serve as a yardstick for the overall evaluation of the final decision (i.e., the individual's confidence in it).

In fact, intuition is particularly important at the choice stage. Congruence between the outcomes of the systematic decision process and the intuitively appealing occupational alternatives can strengthen the individual's confidence in her choice, while incongruity should call for a re-examination of the decision process and the intuitive choice to locate the reason(s) for the incompatibilities, reconcile reason and intuition, and arrive at a confident decision.

According to this approach, criticism of the decision-making framework (e.g., Krieshok, 1998, 2001) can be regarded as reflecting the challenges and intricacies involved in adopting decision models as a framework for career decisions. While purely rational decision processes are insufficient for the purpose, it is suggested that career guidance should encourage a *systematic* process of career decision-making. The challenge is to explore and refine the prescriptive models and tailor career guidance interventions to the unique features and decision-making style of each individual.

Career Decision-Making Styles

A common factor in the use of different decision models in career counselling is framing the decision problem analytically and breaking down the decision task into stages, thus enabling the client to focus on one task at a time (Pitz & Harren, 1980). Clearly, the deliberative analytic procedure involved in this approach may be more appealing to individuals with a more rational-analytical decision making style than to those with a more intuitive or impulsive style. Several classifications have been suggested for describing the different types of decision-makers along a continuum ranging from spontaneous, intuitive decision-making to a rational, systematic style. For example, Harren (1979) distinguished among three career-decision-making styles: rational, intuitive, and dependent. Scott and Bruce (1995) distinguished among five decision-making styles: rational, avoidant, intuitive, dependent, and spontaneous, whereas Sagiv (1999) distinguished between those seeking tools and those seeking answers. In addition, Bettman, Luce, and Payne (1998) and Sauermann (2005) proposed that individuals can also be characterised by their choice goals (maximising decision accuracy, minimising cognitive effort, minimising negative emotions, and maximising the justifiability of the decision). This diversity in decision styles has implications for the guidance practices and decision strategies different people will benefit from most. Career counsellors need to use flexible and varied decision models and counselling interventions to best satisfy each client's unique needs and tailor the intervention to the client's personal career-decision-making style. Indeed, by understanding how the client usually makes decisions the counsellor can better predict the benefit the client may derive from being instructed in various models or procedures. However, if the client agrees to explore a style new to her, a coaching role on the part of the counsellor may be appropriate (Chung, Allen, & Coleman, 2003).

Applying Career-Decision-Making Models

Decision-making models can be used for facilitating better career decisions in three complementary ways: (a) by the counsellor in face-to-face situations; (b) as a blueprint for computer-based career guidance systems; and (c) as a learned systematic framework for independent implementation. These options are briefly explored in the following sections.

Face-to-Face Individual Counselling

In their role as decision advisors, career counsellors have the goals of facilitating their clients' decision-making process and helping them arrive at an optimal and

feasible choice. To tailor the counselling sessions to the counselee's unique needs, counsellors should begin the process by assessing the client's current stage in the decision process and the sources of his or her difficulties in making the decision. A variety of theory-based instruments are available for this assessment. The Career Decision Scale (Osipow, Carney, & Barak, 1976) can be used for an overall assessment of the individual's career indecision. The Career Decision-making Difficulties Questionnaire (CDDQ, Gati et al., 1996b), which is based on a well-defined and empirically validated taxonomy stemming from decision theory, can be used for locating the specific focuses of an individual's difficulties in making career decisions. The Indecisiveness Scale developed by Germeijs and De Boeck (2002) can be used for measuring the clients' general indecisiveness. Finally, the Emotional and Personality-related Career Difficulties (EPCD) scale has been developed by Saka et al. (2008) to asses the emotional and personality-related sources of difficulties in making career decisions, which are assumed to underlie more prolonged career indecisiveness.

Indeed, the difficulties arising during the decision-making process can be divided into those stemming from emotional sources related to general indecisiveness (e.g., great choice anxiety, internal and external conflicts; Gati et al., 1996b; Saka et al., 2008) and from cognitive sources related to the more normative developmental indecision (e.g., lack of information about how to make the decision or how to obtain occupational information). Accordingly, different types of counselling intervention can also be tailored to focus on treating the various emotional and personality-related difficulties involved in career decisions (Saka et al., 2008) or addressing cognitive, information-processing-related difficulties. Systematic decision-making models belong to the latter type. The counsellor's role is to guide clients through the stages of the decision-making process, encouraging them to play an active and dominant role at each stage. A decision model can be used by the counsellor in two ways: as a framework for a dynamic counsellor-client dialogue and as a way of monitoring the client's advancement in the process (Gati & Asher, 2001a).

Nevertheless, the two types of counselling techniques are mutually dependent and complementary; the decision-making process cannot be completed without dealing with the emotional difficulties hindering it, or referring to emotional considerations involved in it, and at the same time it also requires the completion of a cognitive process of information processing and choice.

Decision Aids: Computer-Assisted Career-Guidance Systems (CACGS)

Despite the advantages and extensive knowledge of expert counsellors, career decisions require the synthesis of vast amounts of information that no person can retain. Now, in the twenty-first century, this information can be stored and processed by Internet-based career information and guidance systems. The rapid development and spread of computer and information technologies in recent decades has turned

the computer into a widely accessible, highly sophisticated instrument, offering interactive systems that can support the decision-making process. First, by incorporating relevant, evidence-based tools, computers can help assess the needs of individuals and, in particular, the difficulties they face in making career decisions (Gati, 1996). Second, they can provide clients with recommendations and guidance on how to best proceed in the career decision-making process (which may include a referral for face-to-face career counselling; Amir et al., 2008). Finally, computers can compensate for the limitations of human cognition by offering unlimited computational abilities as well as immense databases and efficient search engines. This permits the presentation of information in a friendly, comprehensible format, using graphics, audio, and video technologies. Most presently available CACGS (e.g., CIS, DISCOVER, CHOICES, MBCD) can be used for both the prescreening stage of locating promising options and the in-depth exploration stage of collecting comprehensive information on these options (Payne et al., 1993). The status of the use of computers for career guidance and counselling was reviewed by Harris-Bowlsbey and Sampson (2005).

Although CACGS have many advantages, they have significant disadvantages as well. Self-help CACGS of highly variable quality can be found on the Internet. Under the presumption of guiding the individual through an important and meaningful career decision, unreliable and biased systems may mislead the user and even cause harm. Moreover, it is important to be aware of clients' tendency to regard computer output as objective and "absolutely true". Therefore, the utility and empirical validity of the system are extremely important, especially when it is used without the monitoring of an expert counsellor. The increased use of self-help systems highlights the need for defining standards for quality career-guidance systems, and reducing the disadvantages of CACGS (Gati, 1994, 1996; Offer & Sampson, 1999; Sampson, Lumsden, & Carr, 2001).

One of the important challenges for the future development of CACGS is to upgrade system interactivity by developing systems that will be able to monitor not only the user's inputs (e.g., the degree of crystallisation of preferences; Shimoni, Gati, & Tal, 2007), but also the system's recommendations (Gati & Ram, 2000; Shimoni et al., 2007). An ideal CACGS should be able to provide a personal diagnosis that resembles a counsellor's initial diagnosis: the system should identify the user's maturity and readiness to use it, assess the client's decision-making style, cognitive level and specific needs, and accordingly provide the individual with a personally tailored dialogue.

Finally, it is important to note that most CACGS do not aim at supplanting the professional career counsellor, but rather at supporting and facilitating the counselling process. Such systems are typically used between face-to-face counselling sessions. A printed output that summarises the outcome of the interaction between the client and the system, and the recommendations received, can be very useful in facilitating the integration of this instrument into the counselling process. Moreover, empirical evidence indicates that CACGS are most effective when used with the guidance of a counsellor, rather than as a stand-alone self-help tool (Harris-Bowlsbey, Riley-Dikel, & Sampson, 2002; Harris-Bowlsbey & Sampson,

2001). Furthermore, since CACGSs focus on the cognitive aspects of the decision rather than the affective ones, face-to-face counselling is not redundant.

Decision-Models as a Learned Systematic Framework for Independent Implementation by Individuals

This chapter had emphasised the notion of career development as a continuous process including multiple decisions. The necessity of dealing with a variety of decisions during one's career path, as well as other multi-alternative decision situations, calls for acquiring and internalising decision skills.

Promoting informed career-decision-making is a generally-agreed-upon goal (Phillips, 1992). This challenge has two components – increasing access to relevant information and increasing the individual's capability to process the information needed to make the decision. Formal educational systems, counselling programs at universities, and training programs for unemployed individuals, can and should contribute to this purpose by including strategies for dealing with complex decision situations among the basic skills they teach. Indeed, people have increasingly become aware of the need to teach decision-making strategies (e.g., Baron & Brown, 1991; http://www.vcu.edu/rrtcweb/techlink/GEB/hughes/tc8f2.html, both retrieved January 30, 2008). Thus, CACGS, face-to-face counselling, and instruction in systematic decision-making complement rather than compete with one another; their combination seems to be the most effective and beneficial way to promote career decision making.

Conclusions

This chapter discussed the potential of the decision-theory perspective as a framework for better understanding the career-decision-making process and facilitating better career decisions. Recent reviews and discussions (e.g., Krieshok et al., 2006; Sauermann, 2005; Van Esbroeck et al., 2005; Phillips & Jome, 2005) have highlighted the increasing awareness and acknowledgment of the need to focus on specific aspects in the career decision-making process, in addition to the developmental circumstances in which they are made (which is the focus of the career-development theories; Osipow & Fitzgerald, 1996), and their resulting person-environment congruence (elaborated by P-E Fit theories). Thus, the three perspectives – decision theory, development theories, and P-E fit – appear to complement each other from both the theoretical and the practical points of view. The unique contribution of the decision-making perspective is in presenting a systematic tool for a flexible process that can increase the individual's ability to make the decision right.

Career counsellors and deliberating individuals have access to a profusion of instruments that can provide important information relevant for both. However,

there is still a need for further developments of the theoretical foundations of career decision-making, and for strengthening the mutual enrichment between theoretical knowledge and the hands-on experience of career counsellors, to better reveal the actual processes involved in making career decisions and to suggest designs for decision aids. The objective, as was discussed in the chapter, should not be the unattainable goal of helping clients make purely rational decisions, but rather helping them make better career decisions through a systematic process. The combination of theoretical knowledge, the experience of professional counsellors, and the newly available information and communication technologies, provides a promising future for the development of innovative models, procedures, and instruments for assisting individuals in becoming adaptive decision-makers while getting ahead along the multi-forked, twisting career paths of the twenty-first century.

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References

Amir, T., Gati, I., & Kleiman, T. (2008, in press). Understanding and interpreting career decision-making difficulties. *Journal of Career Assessment*.

Anker, R. (1998). *Gender and jobs: Sex segregation of occupations in the world*. Geneva, Switzerland: International Labour Organization.

Anker, R. (2001). Theories of occupational segregation by sex: An overview. In M. F. Loutfi (Ed.), *Women, gender and work: What is equality and how do we get there*? (pp. 129–155). Geneva, Switzerland: International Labour Organization.

Badgett, M. V. L., & Folbre, N. (2001). Assigning care: Gender norms and economic outcomes. In M. F. Loutfi (Ed.), *Women, gender and work: What is equality and how do we get there*? (pp. 327–345). Geneva, Switzerland: International Labour Organization.

Baron, J., & Brown, R. V. (Eds.). (1991). *Teaching decision making to adolescents*. Mahwah, NJ: Erlbaum.

Beach, L. R. (1993). Broadening the definition of decision making: The role of prechoice screening of options. *Psychological Science, 4*, 215–220.

Beach, L. R., & Potter, R. E. (1992). The pre-choice screening of options. *Acta Psychologica, 81*, 115–126.

Bell, D. E., Raiffa, H., & Tversky, A. (1988). Descriptive, normative, and prescriptive interactions in decision making. In D. E. Bell, H. Raiffa, & A. Tversky (Eds.), *Decision making* (pp. 9–30). New York: Cambridge University Press.

Bendor, J. (2004). Bounded rationality. In N. J. Smelser & P. B. Baltes (Eds.), *International encyclopedia of the social and behavioral sciences* (Vol. 2, pp. 1303–1307). Amsterdam, The Netherlands: Elsevier.

Bettman, J. R., Luce, M. F., & Payne, J. W. (1998). Constructive consumer choice process. *Journal of Consumer Research, 25*, 187–217.

Blustein D. L. (2006). *The psychology of working*. Mahwah, NJ: Erlbaum.

Bright J. E. H., & Pryor, R. G. L. (2005). The chaos theory of careers: A user's guide. *Career Development Quarterly, 53*, 291–305.

Bright, J., Pryor, R. G. L., Wilkenfeld, S., & Earl, J. (2005). The role of social context and serendipitous events in career decision making. *International Journal for Educational and Vocational Guidance, 5*, 19–36.

Brown, D. (1990). Models of career decision making. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development* (2nd ed., pp. 395–421). San Francisco, CA: Jossey-Bass.

Campbell, R. E., & Cellini, J. V. (1981). A diagnostic taxonomy of adult career problems. *Journal of Vocational Behavior, 19*, 175–190.

Chung, Y. B., Allen, G., & Coleman, M. (2003). Career coaching: Practice, training, professional, and ethical issues. *Career Development Quarterly, 52*, 141–152.

Crites, J. O. (1969). *Vocational psychology*. New York: McGraw-Hill.

Dawis, R., & Lofquist, L. (1984). *A psychological theory of work adjustment*. Minneapolis, MN: University of Minnesota Press.

Gati, I. (1986). Making career decisions: A sequential elimination approach. *Journal of Counseling Psychology, 33*, 408–417.

Gati, I. (1993). Career compromises. *Journal of Counseling Psychology, 40*, 416–424.

Gati, I. (1994). Computer-assisted career counseling: Dilemmas, problems, and possible solutions. *Journal of Counseling and Development, 73*, 51–56.

Gati, I. (1996). Computer-assisted career counseling: Challenges and prospects. In M. L. Savickas & B. W. Walsh (Eds.), *Handbook of career counseling theory and practice* (pp. 169–190). Palo Alto, CA: Davies-Black.

Gati, I. (1998). Using career-related aspects to elicit preferences and characterize occupations for a better person-environment fit. *Journal of Vocational Behavior, 52*, 343–356.

Gati, I., & Asher, I. (2001a). The PIC model for career decision making: Prescreening, in-depth exploration, and choice. In: F. T. L. Leong & A. Barak (Eds.), *Contemporary models in vocational psychology* (pp. 7–54). Mahwah, NJ: Erlbaum.

Gati, I., & Asher, I. (2001b). Prescreening, in-depth exploration, and choice: From decision theory to career counseling practice. *Career Development Quarterly, 50*, 140–157.

Gati, I., & Ram, G. (2000). Counselors' judgments of the quality of the prescreening stage of the career decision-making process. *Journal of Counseling Psychology, 47*, 414–428.

Gati, I., & Tikotzki, Y. (1989). Strategies for the collection and processing of occupational information in making career decisions. *Journal of Counseling Psychology, 36*, 430–439.

Gati, I., & Winer, D. (1987). The relationship between vocational interests and the location of an ideal occupation in the individual's perceived occupational structure. *Journal of Vocational Behavior, 30*, 295–308.

Gati, I., Fassa, N., & Mayer, Y. (1998). An aspect-based approach to person-environment fit: A comparison between the aspect structure derived from characteristics of occupations and that derived from counselees' preferences. *Journal of Vocational Behavior, 53*, 38–43.

Gati, I., Garty, Y., & Fassa, N. (1996a). Using career-related aspects to assess person-environment fit. *Journal of Counseling Psychology, 43*, 196–206.

Gati, I., Krausz, M., & Osipow, S. H. (1996b). A taxonomy of difficulties in career decision making. *Journal of Counseling Psychology, 43*, 510–526.

Gati, I., Houminer, D., & Aviram, T. (1998). Career compromises: Framings and their implications. *Journal of Counseling Psychology, 45*, 505–514.

Gati, I., Saka, N., & Krausz, M. (2001). "Should I use a computer-assisted career guidance system?": It depends on where your career decision-making difficulties lie. *British Journal of Guidance and Counselling, 29*, 301–321.

Gati, I., Kleiman, T., Saka, N., & Zakai, A. (2003). Perceived benefits of using an internet-based interactive career planning system. *Journal of Vocational Behavior, 62*, 272–286.

Gati, I., Gadassi, R., & Shemesh, N. (2006). The predictive validity of a computer-assisted career decision-making system: A six-year follow-up. *Journal of Vocational Behavior, 68*, 205–219.

Gelatt, H. B. (1962). Decision-making: A conceptual frame of reference for counseling. *Journal of Counseling Psychology, 9*, 240–245.

Gelatt, H. B. (1989). Positive uncertainty: A new decision-making framework for counseling. *Journal of Counseling Psychology, 36*, 252–256.

Germeijs, V., & De Boeck, P. (2002). A measurement scale for indecisiveness and its relationship to career indecision and other types of indecision. *European Journal of Psychological Assessment, 18*, 113–122.

Ginzberg, E., Ginsburg, S. W., Axelrad, S., & Herma, J. L. (1951). *Occupational choice: An approach to general theory*. New York: Columbia University Press.

Gottfredson, L. S. (1981). Circumscription and compromise: A developmental theory of occupational aspirations. *Journal of Counseling Psychology, 28*, 549–579.

Grupe, F. H. (2002). An Internet-based expert system for selecting an academic major: www.MyMajors.com. *Internet and Higher Education, 5*, 333–344.

Harren, V. A. (1979). A model of career decision making for college students. *Journal of Vocational Behavior, 14*, 119–133.

Harris-Bowlsbey, J., & Sampson, J. P. (2001). Computer-based career planning systems: Dreams and realities. *The Career Development Quarterly, 49*, 250–260.

Harris-Bowlsbey, J., & Sampson, J. (2005). Use of technology in delivering career services worldwide. *Career Development Quarterly, 54*, 48–56.

Harris-Bowlsbey, J., Riley-Dikel, M., & Sampson, J. P. (Eds.). (2002). *The Internet: A tool for career planning* (2nd ed.). Tulsa, OK: National Career Development Association.

Hogarth, R. M. (1987). *Judgment and choice* (2nd ed.). New York: Wiley.

Holland, J. L. (1997). *Making vocational choices* (3rd ed.). Odessa, FL: Psychological Assessment Resources.

Iyengar, S., Wells, R., & Schwartz, B. (2006). Doing better but feeling worse: Looking for the "best" job undermines satisfaction. *Psychological Science, 17*, 143–150.

Janis, I. L., & Mann, L. (1977). *Decision making*. New York: Free Press.

Jepsen, D. A., & Dilley, J. S. (1974). Vocational decision-making models: A review and comparative analysis. *Review of Educational Research, 44*, 331–349.

Kahneman, D., & Tversky, A. (1984). Choices, values, frames. *American Psychologist, 39*, 341–350.

Kaldor, D. B., & Zytowski, D. G. (1969). A minimizing model of occupational decision-making. *Personnel and Guidance Journal, 47*, 781–788.

Katz, M. R. (1966). A model for guidance for career decision making. *Vocational Guidance Quarterly, 15*, 2–10.

Katz, M. R. (1979). Assessment of career decision making: Process and outcome. In A. M. Mitchell, G. B. Jones, & J. D. Krumboltz (Eds.), *Social learning and career decision-making* (pp. 81–101). Cranston, RI: Carroll Press.

Katz, M. R. (1993). *Computer-assisted career decision making*. Hillsdale, NJ: Erlbaum.

Kleiman, T., & Gati, I. (2004). Challenges of Internet-based assessment: Measuring career decision-making difficulties. *Measurement and Evaluation in Counseling and Development, 37*, 41–55.

Krieshok, T. S. (1998). An anti-introspectivist view of career decision making. *Career Development Quarterly, 46*, 210–229.

Krieshok, T. S., (2001). How the decision-making literature might inform career center practice. *Journal of Career Development, 27*, 207–216.

Krieshok T. S., Black M. D., & McKay R. A., (2006). *Reason, intuition, and engagement: A trilateral model of adaptive career decision-making*. Unpublished manuscript, School of Education, University of Kansas.

Krumboltz, J. D. (1979). A social learning theory of career decision making. In A. M. Mitchell, G. B. Jones, & J. D. Krumboltz (Eds.), *Social learning and career decision-making* (pp. 19–49). Cranston, RI: Carroll Press.

Miller, G. A. (1956). The magical number seven, plus or minus two: Some limits on our capacity for processing information. *Psychological Review, 63*, 81–97.

Mitchell, L. K., & Krumboltz, J. D. (1984). Research on human decision making: Implications for career decision making and counseling. In S. D. Brown & R. W. Lent (Eds.), *Handbook of counseling psychology* (pp. 238–282). New York: Wiley.

Mitchell, L. K., & Krumboltz, J. D. (1990). Social learning approach to career decision making: Krumboltz's theory. In D. Brown, L., Brooks, & Associates (Eds.), *Career choice and development* (2nd ed., pp. 145–196). San Francisco, CA: Jossey-Bass.

Mitchell, L. K., Levin, A., S., & Krumboltz, J. D. (1999). Planned happenstance: Constructing unexpected career opportunities. *Journal of Counseling and Development, 77*, 115–124.

Mitchell, W. D. (1975). Restle's choice model: A reconceptualization for a special case. *Journal of Vocational Behavior, 6*, 315–330.

Montgomery, H. (1983). Decision rules and the search for a dominance structure: Towards a process model of decision making. In: P. Humphreys, O. Svenson, & A. Vari (Eds.), *Analyzing and aiding decision processes* (pp. 343–369). Amsterdam/Budapest: North-Holland and Hungarian Academic Press.

Montgomery, H. (1989). From cognition to action: The search for dominance in decision making. In H. Montgomery & O. Svenson (Eds.), *Process and structure in human decision making* (pp. 23–49). New York: Wiley.

Offer, M., & Sampson, J. P. (1999). Quality in the content and use of information and communications technology in guidance. *British Journal of Guidance and Counselling, 27*, 501–516.

Osipow, S. H. (1999). Assessing career indecision. *Journal of Vocational Behavior, 55*, 147–154.

Osipow, S. H., & Fitzgerald, L. F. (1996). *Theories of career development* (4th ed.). Boston, MA: Allyn & Bacon.

Osipow, S. H., Carney, C. G., & Barak, A. (1976). A scale of educational-vocational undecidedness: A typological approach. *Journal of Vocational Behavior, 9*, 233–243.

Paquette, L., & Kida, T. (1988). The effect of decision strategy and task complexity on decision performance. *Organizational Behavior and Human Decision Processes, 41*, 128–142.

Parsons, F. (1909). *Choosing a vocation*. Boston, MA: Houghton Mifflin.

Payne, J. W., Bettman, J. R., & Johnson, E. J. (1993). *The adaptive decision maker*. Cambridge, NY: Cambridge University Press.

Payne, J. W., Bettman, J. R., & Schkade, D. A. (1999). Measuring constructed preferences: Towards a building code. *Journal of Risk and Uncertainty, 19*, 243–270.

Phillips, S. D. (1992). Career counseling: Choice and implementation. In S. D. Brown & R.W. Lent (Eds.), *Handbook of counseling psychology* (2nd ed., pp. 513–547). Oxford, England: Wiley.

Phillips, S. D. (1994). Choice and change: Convergence from the decision-making perspective. In M. L. Savickas & R. W. Lent (Eds.), *Convergence in career development theories: Implications for science and practice* (pp. 155–163). Palo Alto, CA: Consulting Psychologist Press.

Phillips, S. D., & Jome, L. M. (2005). Vocational choices: What do we know? What do we need to know? In W. B. Walsh & M. L. Savickas (Eds.), *Handbook of vocational psychology* (3rd ed., pp. 127–153). Mahwah, NJ: Erlbaum.

Phillips, S. D., Christopher-Sisk, E. K., & Grauino, K. L. (2001). Making career decisions in a relational context. *Counseling Psychologist, 29*(2), 193–213.

Pitz, G. F., & Harren, V. A. (1980). An analysis of career decision making from the point of view of information processing and decision theory. *Journal of Vocational Behavior, 16*, 320–346.

Potter, R. E., & Beach, L. R. (1994). Imperfect information in pre-choice screening of options. *Organizational Behavior and Human Decision Processes, 59*, 313–329.

Pryor, R. G. L. (1981). Tracing the development of the work aspect preference scale. *Australian Psychologist, 16*, 241–257.

Pryor, R. G. L. (1982). Values, preferences, needs, work ethics, and orientation to work: Towards a conceptual and empirical integration. *Journal of Vocational Behavior, 20*, 40–52.

Roe, A. (1956). *The psychology of occupations*. New York: Wiley.

Rounds, B. J., & Tinsley, H. E. A. (1984). Diagnosis and treatment of vocational problems. In S. D. Brown & R. W. Lent (Eds.), *Handbook of counseling psychology* (pp. 137–177). New York: Wiley.

Saka, N., Gati, I., & Kelly, K. R. (2008, in press). Emotional and personality-related aspects of career decision-making difficulties. *Journal of Career Assessment*.

Sagiv, L. (1999). Searching for tools versus asking for answers: A taxonomy of counselee behavioral styles during career counseling. *Journal of Career Assessment, 7*, 19–34.

Sampson, J. P., Lumsden, J. A., & Carr, D. L. (2001). Computer-assisted career assessment. In J. T. Kapes & E. A. Whitfield (Eds.), *A counselor's guide to career instruments* (4th ed.). Columbus, OH: National Career Development Association.

Sauermann, H. (2005). Vocational choice: A decision making perspective. *Journal of Vocational Behavior, 66*, 273–303.

Savickas, M. L. (1999). The psychology of interests. In M. L. Savickas & A. R. Spokane (Eds.), *Meaning, measurement, and counseling use of vocational interests* (pp. 19–56). Palo Alto, CA: Consulting Psychologist Press.

Savickas, M. L. (2000). Renovating the psychology of career of the twenty-first century. In A. Collin & R. A. Young, (Eds.), *The future of career* (pp. 53–68). New York: Cambridge University Press.

Savickas, M. L. (2005). The theory and practice of career construction. In S. D. Brown & R. W. Lent (Eds.), *Career development and counselling: Putting theory and research to work* (pp. 42–70). Hoboken, NJ: Wiley.

Scott, S. G., & Bruce, R. A. (1995). Decision-making style: The development and assessment of a new measure. *Educational and Psychological Measurement, 55*, 818–831.

Shimoni, A., Gati, I., & Tal, S. (2007). Assessing the quality of the inputs and outputs of the pre-screening stage of the career decision-making process. Unpublished manuscript. Department of Psychology, Hebrew University of Jerusalem.

Schwartz, B. (2004). *The paradox of choice: Why more is less*. New York: Ecco.

Simon, H. A. (1955). A behavioral model of rational choice. *Quarterly Journal of Economics, 69*, 171–191.

Simon, H. A. (1981). *The sciences of the artificial* (2nd ed.). Cambridge, MA: MIT.

Simon, H. A. (1990). Invariants of human behavior. *Annual Review of Psychology, 41*, 1–19.

Super, D. E. (1972). Vocational development theory: Persons, positions, and processes. In J. M. Whiteley & A. Resnikoff (Eds.), *Perspectives on vocational development*. Washington, DC: American Personnel and Guidance Association.

Super, D. E. (1980). A life-span, life-space approach to career development. *Journal of Vocational Behavior, 16*, 282–298.

Super, D. E. (1990). A life-span, life-space approach to career development. In D. Brown, L. Brooks, & Associates (Eds.), *Career choice and development* (2nd ed., pp. 197–261). San Francisco, CA: Jossey-Bass.

Tinsley, H. E. A. (1992). Career decision making and career indecision. *Journal of Vocational Behavior, 41*, 209–211.

Tversky, A. (1972). Elimination by aspects: A theory of choice. *Psychological Review, 79*, 281–299.

Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*, 1124–1131.

Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science, 211*, 453–458.

Van Esbroeck, R., Tibos, K., & Zaman, M. (2005). A dynamic model of career choice development. *International Journal for Educational and Vocational Guidance, 5*, 5–18.

Walsh, W. B. (2004). Vocational psychology and personality. In B. Schneider & D. B. Smith (Eds.), *Personality and organizations* (pp. 141–161). Mahwah, NJ: Erlbaum.

Zakay, D., & Barak, A. (1984). Meaning and career decision making. *Journal of Vocational Behavior, 24*, 1–14.

Zytowski, D. G. (1970). The concept of work values. *Vocational Guidance Quarterly, 18*, 176–186.