Chapter 1
Creative Synthesis: Combining the 4C and Systems Models of Creativity

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Abstract This chapter is a literature-informed conceptual essay that introduces dynamic creativity and bridges it with influential theory and generative possibility. The dynamic creativity construct grows out of the research on dynamics of creativity—both educational and cultural. Discussion moves to select influential creativity theories—Beghetto and Kaufman's 4C Model of Creativity and Csikszentmihalyi's systems model of creativity. A creative synthesis of these theories foregrounds their dynamic possibilities with graphical representation. A fifth C—Hidden-c—extends the theorizing about creativity with reference to Corazza's theory of dynamic creativity, which is demonstrated in a Chinese education classroom. Hidden-c refers to creative self-beliefs and behaviors that trigger the personal power of creativity and capacity for engaging in dynamic creativity. The role of adopter and shaper of creativity models informs the approach of this eclectic, layered work that is supported with original graphics. Implications for continuing the conversation about dynamic creativity conclude it.

1.1 Overview: Questions and Purposes

How might dynamic creativity apply to influential theory and generative possibility? This speculation—at the heart of this literature-informed conceptual essay—is itself a response to creativity researchers' call to advance notions of dynamic creativity. To quote Beghetto (2016), a proponent of this shift in the creativity paradigm, "As our understanding of the phenomenon of creativity continues to grow, it is becoming more and more evident that researchers need new ways of conceptualizing, identifying and studying creativity in the midst of social practices" (p. 270). Tan (2013) also calls for a new level of reflection by forward-thinking creativity researchers regarding "knowledge of creativity and cultivating creativity" (p. 27).

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Adding to this dialogue, I consider dynamic creativity in relationship to influential creativity theories.

In response, wanting to experience dynamic creativity that is educational and cultural in nature, I engage two highly recognized academic creativity theories: Kaufman and Beghetto's (2009) 4C Model of Creativity and Csikszentmihalyi's (1996, 1999) systems model. Into my theory-building I integrate the unique contribution of Corazza's (2016) theory of dynamic creativity for which my new idea of Hidden-c is being introduced (following my initial presentation of it to the teacher education field, Mullen, 2018).

1.2 Literature Review Methods

In this section, I present my creative methods. My methodological aims are to identify, discuss, and conceptualize select scholarship of contemporary influence in the area of creativity.

1.2.1 Identifying Creativity Scholarship as Primary Purpose

Scholars' creativity theories in psychology and education were sought in the published canon. Methodological support for theory-building predominantly came from Kaufman and Beghetto's (2009) and Csikszentmihalyi's (1996) creativity models. Herein I display a synthesis of these frameworks, with discussion of possible overlap and interplay.

Another step involved reviewing the academic literature on creativity in high-impact journals and books spanning 1996–2017. Cambridge University Press and Springer are among the sponsoring publishers. Online databases searched included the full text holdings of publishers and my home university's library. ERIC from WorldCat and Education Research Complete from EBSCOhost yielded relevant articles from academic journals and pertinent books. Also, documents were accessed via Google Scholar.

Discourse about creativity appeared in diverse sources: academic journals devoted to the topic of creativity (e.g., *Creativity Research Journal*), book series (e.g., Creativity Theory and Action in Education, published by Springer), and edited books (e.g., Kaufman & Sternberg, 2010). Influential theoretical and empirical sources were located using the search term *creativity* in association with *culture*, *education*, *educational psychology*, and *theory.*

In an earlier literature review of creativity frameworks (Mullen, 2017a), I found that educational psychology was particularly well represented among the academic disciplines as a prolific contributor to the creativity paradigm. Moreover, educational psychology is multidisciplinary and transdisciplinary (as opposed to insular

in its disciplinarity) in both the conception and treatment of creativity. Tan (2013) confirms academics' "efforts to explore new paradigms of creativity" (p. 27).

Pedagogically oriented research questions from my completed study (Mullen, 2017a, 2018) illustrate creativity in action. To paraphrase, what examples of Mini-c, Little-c, Pro-C, and Big-C might Chinese education students identify when prompted, challenged, and engaged? What might test-weary students in regimented academic programs experience when exposed to open-ended creativity concepts and activities?

As discussed later, I found the select creativity frameworks amenable to the creative development of Chinese preservice teachers. Moving past the disciplinary boundary as such into teacher education is not new for educational psychologists. (My disciplines are educational leadership and curriculum studies, with overlap in educational psychology). Border crossing has created forays into early childhood education (Craft, Cremin, Burnard, Dragovic, & Chappell, 2012; Craft, McConnon, & Matthews, 2012), cultural studies (e.g., Sternberg, 2006), systems thinking/science and sociology (Csikszentmihalyi, 1996, 1999), and more. Thus, I found *educational psychology* useful as a baseline descriptor for searching databases and taking my analysis into other disciplines.

Reviewing the creativity research, I settled on four criteria that arose from Kaufman and Beghetto's (2009) and Csikszentmihalyi's (1996) models.

1. Communities of creativity researchers worldwide cite and describe the recognized theory, using it as point of reference for advancing the conversation about creativity within the field (e.g., Neber & Neuhaus, 2013).
2. The recognized theory advances the author's knowledge-building about creativity, such as by using systems theory (e.g., Tan, 2013).
3. Application to pedagogical and learning contexts extends the well-known theory's influence and value in such areas as the nurturing of creativity within classrooms and schools subjected to high-stakes standardized testing (Collard & Looney, 2014).
4. The recognized theory is central to the ongoing debate around complexities involved in the individual creator's relationship to, and interplay with, impactful cultural and environmental forces (e.g., Glăveanu & Tanggaard, 2014).

To clarify, creativity researchers have described, analyzed, applied, or in some other way highlighted these select theories.

1.3 Definitions of Key Terms and Concepts

Creativity, culture, and systems all constitute complex, changing domains of knowledge in academia. An overwhelming number of definitions and multiple conceptualizations exist. As conceived for this writing, each is anchored to the dynamic creativity construct.

1.3.1 Creativity

Creativity generally refers to generating something new and valuable that is tangible (e.g., an invention or literary work) or intangible (e.g., an idea or theory) (Mumford, 2003). More specifically, it encompasses the collaborative process of seeking creative solutions to complex problems and performances known as "collaborative creativity" (Sawyer, 2012). In such group situations, the "collective social product" is not attributable to individuals (Sawyer, 2012, p. 67). Original work and transformation of ideas or things into something novel is a dynamic creative process, as is the re-creation or reinvention of that which already exists. Knowledge-building can also be creative (Tan, 2013), as can applying knowledge in pedagogic contexts (Beghetto, 2006) and thoughtfully appraising knowledge (Robinson, 2015). Open-ended questions invoke creativity and the unknown. Complex problem identification and problem-solving enhance processes of discovery.

1.3.2 Culture

Culture is the "act of developing the intellectual and moral faculties especially by education," as well as the "knowledge, belief, and behavior that [rely on] the capacity for learning and transmitting knowledge to succeeding generations" ("Culture," 2017). Besides educational value, the arts, creativity, and other self-expressions are regarded collectively as integral to culture.

While culture takes into account "a person's learned, accumulated experience" (Zimmermann, 2015), to have cultural impact, a creative idea must be admitted in a "cultural domain" (Csikszentmihalyi, 1996). Influential creative works can come from radically different cultures and worldviews (Kaufman & Beghetto, 2009) supporting the claim that dynamic creativity can occur anywhere and everywhere.

1.3.3 Systems

Systems thinking is a popular way of framing creativity that recognizes creative processes as emergent, self-organizing, and chaotic. Sawyer (2012) attributes to Csikszentmihalyi (1988), albeit not exclusively, the development of the systems model for which analysts of creativity seek to explain the micro (individual) and macro (social system) interrelationship. To Sawyer, navigating systems is a creative collaborative phenomenon involving social groups. Keller-Mathers and Murdock (1999) similarly reason that creators must navigate a system (e.g., organization) and its levels and domains to succeed. Expertise facilitates progress through these levels, coming to understand how to create novelty and perhaps even contribute to shared knowledge (Csikszentmihalyi, 1999).

Viewing creativity as a system, as Csikszentmihalyi (1996, 1998, 1999) does, draws attention to "interrelated forces operating at multiple levels" (Hennessey, 2013, p. viii). Even "an individual is regarded as a system," with psychological and other "subsystems" that have "to function well to regulate efficiently" (Tan, 2013, pp. 30–31).

1.3.4 Dynamic Creativity

To present a working definition of *dynamic creativity*, I borrow from key sources that resonate with my intended meanings: Corazza's (2016) notion of dynamic creativity as a phenomenon outliving "static creative achievement" (p. 261) and Glăveanu and Tanggaard's (2014) idea of creative identity as always changing, making identity protean and generative. Dynamic creativity is a complicated process and has "inconclusive outcomes" for creators, according to Corazza.

Dynamic connotes both power/ful and able ("Dynamic," 2017). Complex, dynamic interplays among individuals, systems, and cultures stimulate change or progress. Conceived dynamically, creativity involves constant activity, change, or progress and engages "subjectivity and the imagination," which, according to Corazza (2016, p. 262), can incite disagreement among experts where original outcomes question or violate norms.

In contrast, *stasis* blocks action and progress. Narrow definitions and pathways of creativity connote stasis, as in when outcomes of creative achievement shortchange the multitude of dynamics involved in generativity. Instead, dynamic processes of creativity involve the "search for original ideas" and "exploration of multiple alternatives" (Corazza, 2016, p. 261). From this perspective, complexities and unknowns are integral to active engagement and should thus be recognized as having creative value. As such, a richer definition of creativity incorporates the word "potential": "Creativity requires potential originality and effectiveness" (p. 262). Adding this lens arguably invokes another way of seeing, appreciating, and acknowledging—that is, creativity's dynamism depends upon deep exploration, which ignites uncertainty and indetermination in time-consuming, labor-intensive work.

However, it is not uncommon for complexities and unknowns of creativity to be reduced to several factors and components (in addition to outcomes) ("Stasis," 2017). It should not be overlooked that human dynamics can emerge from systems that themselves are stable yet paradoxically perpetuate the status quo ("Stasis," 2017). Of course, "Disequilibrium may spur [creativity]"—addressing weighty problems or coping with challenges to preconceived ideas can actually benefit the creative process (Collard & Looney, 2014, p. 350).

Either way, whether systems evidence equilibrium or disequilibrium, or a blend, dynamic creativity depends on an attitude of possibility. Craft (e.g., Craft, Cremin, et al., 2012) has long described creativity as possibility thinking, driven by "what-if" formulations. She even forwards possibility thinking as an evidence-based

concept driving creativity. With everyone being capable of questioning and imagining, this creative breakthrough may effect change within systems. From the life sciences, systems theorist Wheatley (1992) also asserts that a "what-if" mindset disrupts a "fix-it" mentality. To her, the possibility attitude promotes renewal of organizational systems and living entities. If possibility is conducive to change, as Ferdig and Ludema (2005) also contend, then generative possibility fuels the existence of dynamic creativity and a speculative future.

1.4 Select Creativity Theories in Psychology

My analysis of the literature and Internet results revealed a frequency of citations to Kaufman and Beghetto's (2009) 4C creativity model and Csikszentmihalyi's (1996, 1999) systems creativity model. Moreover, fellow scholars build on these Western theories, solidifying their value and influence. Recently, these models formed the basis of case studies of creative pedagogy in international settings (e.g., Mullen, 2017a, 2018). My empirical research of creative learning involved education and science students in China and the United States who endure the constraints of high-stakes testing. Openings for creative cultural discoveries evident in these exploratory studies could attract research interest in further globalizing the creativity models.

1.4.1 Kaufman and Beghetto's Creativity Theory

Kaufman and Beghetto's (2009) 4C model has four forms/levels/types of creativity: "Mini-c" is novel and personally meaningful experiences, "Little-c" is everyday problem-solving in work and life, "Pro-C" belongs to creative professionals (not famous), and "Big-C" is creativity of great magnitude reserved for famous works.

1.4.1.1 Mini-c

The most modest of the levels, Mini-c, feeds professional creativity and other types that would not otherwise come into being. As Eisner (2004) describes, meaning-making is itself an aesthetic process, neglected because it is elusive and challenging. Creative beings do not just *have* experiences—they make meaning of them. Communicating our (potential) discoveries, we enliven Mini-c's capacities by attributing meaning to our experiences of events, situations, and dynamics (Eisner, 1991). We creatively render these using images, schemas, and more.

1.4.1.2 Little-c

Humans constantly encounter problems to be (re)solved. Many simply react to problems rather than predicting them and tapping into a greater creative capacity. Many of us creatively use physical or digital objects and tools without much thought about our own artistry. In everyday problem-solving, creativity has endless possibilities—because the problems often encountered in life are ill-defined. More than this, we bring our dominant worldviews, mental models, expectations, and biases to a problem situation, making the concept of *problem* complicated and contextually driven, as well as open-ended and multifaceted (Stanton & Welsh, 2012). When we puzzle over something in daily practice, we are trying to solve a problem. And when we make inferences and decisions and arrive at a solution or judgment, we might very well be creatively problem-solving. A creative person might ask, What does *problem* mean in this context? Are there any alternatives to my socialized ways of seeing, knowing, and believing? (Schwab, 2004; Stanton & Welsh). What is the nature of this problem that I am *anticipating*? (Schwab).

1.4.1.3 Pro-C

Pro-C professional creativity recognizes highly accomplished creativity. Kaufman and Beghetto (2009) added it to their 2007 model, reintroducing it in 2009 as the Four Cs (or 4Cs) of Creativity. Such distinguished contributions move a discipline in a new direction or even completely change it. Pro-C contributions range from replication or improvement of pre-existing products to "reiniation," where creators try "to move the field to a new (as-yet-unreached) starting point and then progress from there" (Kaufman & Beghetto, 2009, p. 6).

Likely, the most creative professionals who study unsystematic, difficult problems are ahead of others beholden to problems already identified. As such, complex problems demand "anticipatory consideration" (Schwab, 2004). Pro-C individuals are inspired "by possible fresh solutions to problems, new modes of attack, and [more]"; they do not miss the "novel features of new problems" (pp. 114–115). Attraction to novelty and originality helps explain that Little-c breakthroughs may lead to creative breakthroughs at recognized levels. Pro-C creators challenge the status quo by disrupting and remaking structures of knowledge, what Csikszentmihalyi (1996) describes as a field or domain's rules and procedures (symbolic knowledge).

1.4.1.4 Big-C

Big-C's famous works of human creative achievement transform societies, even the world. To Dewey (1934), when artwork becomes Big-C by "attain[ing] classic status it somehow becomes isolated from the human conditions under which it was brought into being." (p. 3). Everyday conditions and influences (e.g., activities) that imaginatively inform life should count as part of the cultural treasury. Such story lines are intrinsic to the aesthetics of art.

Creativity researchers building on the 4C creativity model acknowledge that while "extraordinary accomplishments" (in science, art, etc.) are eminent, Big-C's breakthroughs come from "myriads of Little-c creativity accomplishments" (Stoeger, 2003, p. 3). As we move from goal-setting to resolving obstacles, "numerous creative learning decisions" are involved (p. 3).

1.4.2 Csikszentmihalyi's Creativity Theory

Csikszentmihalyi (1996) illustrates his creativity framework using science (astrology) to depict conditions and influences for creative discovery as well as breakthrough. Pertinent across disciplines, his theory demystifies falsehoods associated with creators. This take on creativity conveys "interaction among domain, field, and person" (p. 29) as the source of creativity, not just an individual. He exposes the myth that creativity occurs "inside people's heads" as "some sort of mental activity" belonging to "special people" (p. 23).

Creativity advances as a systematic performance under a particular set of conditions. While someone may stake a claim in a creative act, it must be judged with reference to standards and a social process of evaluation belonging to a domain (academic or professional livelihood). A creative idea manifests, then, by "pass[ing] muster with the experts" before being admitted to a domain (Csikszentmihalyi, 1996, p. 27), where it can become known and make an impact. Creativity "observed only in the interrelations of a system" (p. 27) is a systems model situating the creator within a dynamic ethos of field and domain.

1.4.2.1 Systems Model of Creativity

Csikszentmihalyi's (1996) systems model of creativity encompasses three levels:

1. *Domain* (macro) "consists of a set of symbolic rules and procedures" that are "nested in … culture, or the symbolic knowledge shared by a particular society, or by humanity."
2. *Field* (next level of macro) includes "gatekeepers to the domain [whose] job is to decide whether a new idea or product should be included in the domain."

3. *Person* (micro) "has a new idea or sees a new pattern" that "use[s] the symbols of a given domain" (e.g., engineering), and "this novelty is selected … for inclusion." (pp. 27–28)

(For graphical depictions of Csikszentmihalyi's systems model, see Kahl and Hansen [2015]).

1.4.2.2 Systems Model Illustrations

From interviews with 91 exceptional contributors of knowledge to their domain, Csikszentmihalyi (1996) validates his suppositions, although the creativity field is no longer strictly associated with studies of "genius" or its implied values. Creativity research as a domain is "shift[ing] away from elite, culturally dominant activities to activities found in a range of cultural, ethnic, and social class groups" (Sawyer, 2017, p. 354). Increasingly, the "everyday creativity" of "the working classes or the uneducated" is being studied (Sawyer, p. 354). This trend encompasses teachers and learners' creative processes and interaction within a milieu (see Beghetto, 2016; Craft, Cremin, et al., 2012; Craft, McConnon, et al., 2012; Mullen, 2017a, 2017b, 2018).

An extended vignette enlivens Csikszentmihalyi's (1996) creativity interaction model: An astronomer made a Pro-C discovery that a galaxy's stars do not always rotate in the same direction. While this astronomer had shown herself to be creative, domain experts would have to decide whether to corroborate her creative accomplishment. After her creative discovery was validated, the work was funded and published, and her finding was admitted into astronomy's canon. At the macro level, a complicated, long-term interaction would have transpired, allowing the creator's work to become known and possibly have impact.

Of course, within a knowledge domain, external factors can significantly affect an outcome. Hurdles include an organization's cultural dynamics, a nation's politics, a domain's prohibitive structures, and an individual's circumstances. For example, domain experts may not appreciate a creator's discovery or see it as such, yet, despite barriers and (in)visible dynamics, a creation may still become known.

1.4.2.3 Select Theories' Generative Possibilities

Kaufman and Beghetto (2009) confirm Csikszentmihalyi's (1996) idea of creativity as an interaction among person, domain, and field, concurring that creativity's synergies extend well beyond a person's idea or work. Regardless, they assert the importance of "person" as creativity's primary source.

For Csikszentmihalyi (1996), because the creator is de-emphasized, shaping forces (i.e., field and domain) that impact one's creative capacities come to the fore. Hypothetically speaking, all of the synergies that influence success are exposed. Hence, the creative person is but one of multiple energetic forces at play within a

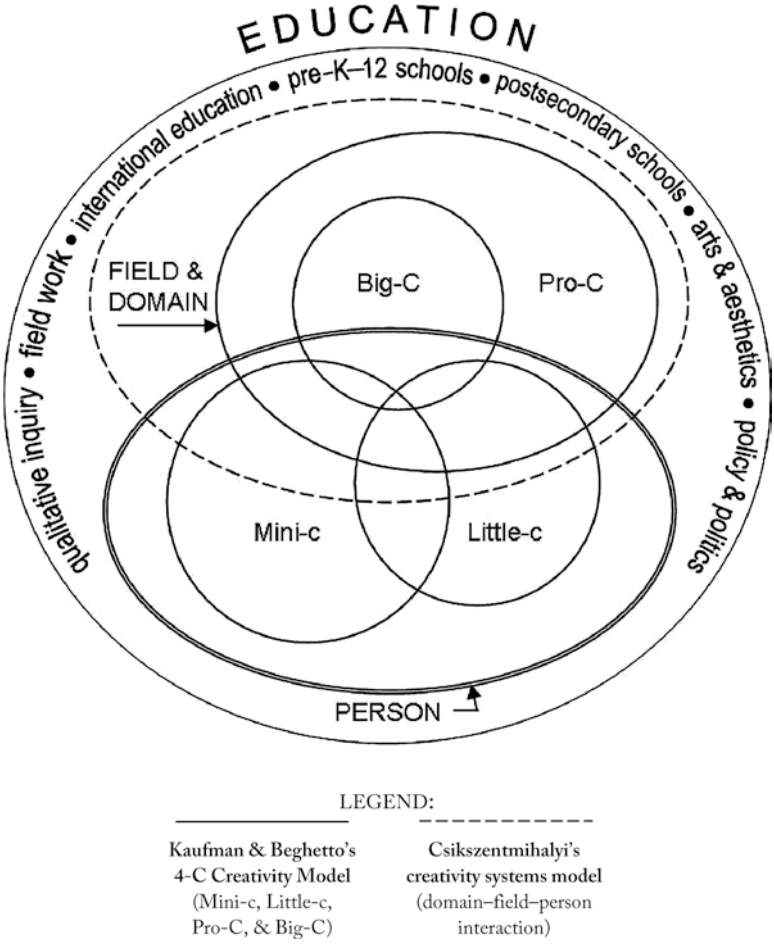

Fig. 1.1 Creative synthesis of 4C and systems models of creativity (Mullen, 2017a)

complex web. For Kaufman and Beghetto, like Csikszentmihalyi, creator and environment interactively influence creative processes and outcomes. What mainly differs in these frameworks is the perspective as to which force predominantly influences the creative sphere—creator (Kaufman and Beghetto) or milieu (Csikszentmihalyi). Context, as in ever-present social influences, is evident within these creativity paradigms, albeit to different degrees.

While these models are not polar opposites, as Fig. 1.1 may suggest, their emphases differ regarding human creativity and influences from the milieu. Evident in Kaufman and Beghetto's (2009) explanation, external forces are still highly influential within this worldview. However, due credit is given to the seeds of generativity (i.e., Mini-c and Little-c) for formulating ideas, making gains, and experiencing breakthroughs that are modest and may not be known to anyone. In my own theory-

building, the two psychology frames intersect not in perfect harmony but more as complementary perspectives on creativity.

However, societies have a bias toward "eminent creativity" (Kaufman & Beghetto, 2009), favoring cultural icons. The greatest inventions of all time have proven transformative for global societies (e.g., cars, compass, Internet, printing press, wheel, vaccination). Revolutionary theories are also numerous, with the most familiar among them including Heliocentrism, evolution by natural selection, quantum theory, relativity, and information theory. The lopsided view of creativity as eminence casts light on such truly groundbreaking creative achievements (inventions and innovations) in their scarce forms. With societal attention long geared as such, the "quality of creative products in schools" fails to attract much attention. Consequently, these lack "clear reference standards" and creativity goes without a common definition in education policy and curricula (Collard & Looney, 2014, pp. 3, 351).

Notably, efforts to raise awareness of creativity that is *not* about Big-C famous works but rather everyday life are also relevant (see Dewey, 1934). Of continuing interest, then, are the near invisible, barely detectable Mini-c and Little-c creative processes (e.g., Beghetto, 2006).

1.5 Systems Theory and Life Systems

An ecological take on creativity is that all societal sectors (e.g., schools) are life systems subject to adaptation, change, disruption, re-organization, and growth. Proactively responding to demographic and global trends is paramount if these sectors are to thrive, innovate, and lead (Wheatley, 2017). Creative thinking, critical thinking, and problem-solving are all capacities for success in innovative, globalized economies (Heyl, 2014). Rigid dispositions, customary patterns, and the status quo do not facilitate innovation and adaptation (Bandura, 1997), yet the struggle to survive is not without politics. In fact, "survival of the fittest" is how Li and Gerstl-Pepin (2014) describe the political rhetoric of economic innovation and revitalization dispossessed of creative vision.

In the creative economy, transforming nations and their subsystems (e.g., institutions) provoke a level of instability. Such creative behavior, intentional or not, disrupts the existing state of affairs, allowing for new and complex learning (Wheatley, 1992). Being innovative and creative as a growing, adapting system necessitates "self-organizing interaction" (Stacey, 1992) and a "transformative interactive" among peers (Ferdig & Ludema, 2005). This kind of work and relationship crosses organizational, disciplinary, and other borders. Team members creatively negotiate boundaries, interacting and combining elements from different contexts that generate the new and unfamiliar (Akkerman & Bakker, 2011; Mullen, 2017a; Sawyer, 2012).

In changing work environments, creativity is a condition of innovation and a crucial component of organizational excellence. In such life systems, transforma-

tion is not subjected readily to one person's vision (Stacey, 1992). No powerful entity is the sole proprietor of creative vision. Perhaps this is why Akkerman and Bakker (2011) identify innovation in teamwork and creativity of organizational collaborators as influencers of expert performance and organizational excellence. Importantly, in disequilibrium, the collective (e.g., activist communities) and influential sectors of society (e.g., tech-savvy youth) enact vision that may conjure exciting (or dangerous) possibilities for creativity.

Living systems—cells, organisms, groups, organizations, and societies—interact with the environment through a flow of ideas, energies, and data. These survive by forming, adapting, sustaining, and even reinventing themselves (Wheatley, 1992). Like other living things, the system (e.g., human being, organization) has a personality, values, and structures (Brown & Moffett, 1999). Micro moves, exchanges, and actions can execute a creative process in the direction of systems renewal.

Beyond human dialogue and action, renewal of a system depends on an attitude of possibility supporting speculation and change (Ferdig & Ludema, 2005; Wheatley, 1992). Human-centric conceptualizations can generate momentum for inquiry and change, no matter how uncertain. Life itself is dynamic, unlike an organizational chart's static representation of life systems (Wheatley & Kellner-Rogers, 1996). To Wheatley (1992), life forces are fluctuations; like those in the universe, these are the "primary source of creativity," producing disturbances and imbalances (p. 20): "Every organization is an identity in motion" (Wheatley & Kellner-Rogers, 1996, p. 58). Viewing the world as a living organism (rather than a machine) is a lesson from Wheatley's (2017) new life science model—systems as organisms are unstable, unpredictable, and uncertain, yet identifiable. Dynamic creativity feeds off such dynamics.

Systems flourish when regenerated and reinvented (Brown & Moffett, 1999). Within such institutions, structures, practices, programs, and policies are attuned culturally and globally (Mullen, Rodriguez, & Allen, 2017). With systems aging, vitality, flexibility, and fluidity diminish, as does the "capacity" for "meet[ing] challenges from unexpected directions" (Gardner, 1963, p. 3). Holding onto obsolete ways of thinking and behaving may be preferred and is an unfortunate habit, but, as Heyl (2014) explains, "a world of distributed learning" confronts "the short shelf life of knowledge" (p. 254).

In a dynamically creative world, power hierarchies give way to new patterns of interaction, collaboration, and interdisciplinary work. Cross-cultural teams and even interorganizational collaboratives draw together expertise from diverse members and fundamentally different organizations to tackle perennial questions of education. One such question is how to revitalize outdated organizations to meet the twenty-first-century demands of rapidly increasing diversity in urban school populations (Mullen et al., 2017). Mature civilizations and their sectors and organizations retool in fundamental ways through such means as an action-oriented vision of diversity, collaborative learning, and strategic alliances. Growth is thriving, functions are team supported, and vibrancy is perceptible.

1.6 Culture Frame

Creativity within high-stakes testing cultures is thought by many educators to produce or perpetuate stymied life systems (e.g., Zhao, 2014). Creative expression and innovation in such schooling contexts, spanning the West and the East, are a struggle to cultivate. As Collard and Looney (2014) explain, a pedagogic problem is the tendency of some teachers to avoid interfering with their students' creative self-expression so as not to dishearten them. In this scenario, learners receive "little guidance" and feedback for improving their work. Consequently, empirical understandings of high-quality creative work need much development.

Consider China's testing milieu. Teachers are expected to help students achieve high test scores and unquestioningly respect authority (Lee & Pang, 2011). Low scores on entrance exams limit future possibilities for Chinese citizens, with severe consequences including poor quality of life and even suicide (Zhao, 2014). China's competitive mindset dominates, undermining such collective strengths as a strong sense of social belonging (Staats, 2011).

Paradoxically, while China's labor markets control education systems and hinder creativity, explains Staats (2011), China is seen as accrediting the collective with being creative (Sternberg, 2006). The collectivist tradition should make it amenable to collaborative expressions of creativity and cooperative groupings, but another constraint is that classes are typically large and teacher centered (Starr, 2010).

In mainstream China, classroom pedagogies must align with rote testing goals even though the World Economic Forum (2013) identifies creativity and entrepreneurship as proficiencies needed for global literacy. However, generative possibilities exist within this test-centric environment where Chinese students—presumed to lack creativity (Li & Gerstl-Pepin, 2014)—have opportunities to experience interventions of creativity. In Mullen's (2017a) study mentioned earlier, 34 Chinese education undergraduates produced dynamic cultural frames of creativity in response to Kaufman and Beghetto's (2009) 4C creativity model. Cooperative work groups and a collectivist orientation supported the creative learning.

Chinese students' reduced creativity likely reflects their culture, learning environment, and teachers' mindset. Niu and Sternberg (2001) had evaluators rate the creativity of Chinese and American college students, finding the American artwork more creative and aesthetic. Negative influences they identify in China are environmental task constraints and the absence of teacher directives to be creative. Similarly, Niu, Zhang, and Yang (2007) attribute the differences in performance of college students in the United States and Hong Kong to cultural influences. (Americans proved stronger in creative thinking on creative writing and problem-solving tasks involving insight).

China's government believes its citizens lack creativity and are incapable of flexible and divergent thinking, critical thinking, and higher order thinking. Students take their directions from teachers who are carriers of the regime. Given its millions of followers, Confucianism has likely reinforced such allegiance to the government.

Chinese students have had to become very good at tested subjects, sacrificing development in open-ended problem-solving. However, despite the generalization that this population is creativity-poor and math-smart, creativity is evident in China's entrepreneurial sector (e.g., Woetzel & Towson, 2013) and has also been witnessed in the educational sector (e.g., Mullen, 2017a, 2017b, 2018).

1.7 Introducing Hidden-c

Interacting with select creativity models from educational psychology, I identify a fifth C—Hidden-c. *Hidden-c* refers to creative self-beliefs and behaviors that trigger the personal power of creativity and capacity for engaging in dynamic creativity (Mullen, 2018). Making a dynamic creative achievement by shifting and changing over time and overcoming challenges encountered quite possibly mobilizes the capacity for influencing environments and being influenced by them. Putting personal creativity center stage as a creator or instructor is strategic—it speaks to our capability to become immersed in the exploratory experience of originality and effectiveness. Altering conditions and situations that affect generative work is a possible outcome.

This creativity construct aligns well with conceptions of dynamic creativity (Corazza, 2016) and complements Kaufman and Beghetto's (2009) 4C creativity model. Using theory-informed application to ground Hidden-c, I envision it as having generative possibilities for which theoretical perspectives and Chinese learning contexts serve as touchstones. To further contextualize Hidden-c in the literature, when creative potential is realized, it manifests as creative achievement (Corazza, 2016) in one of the 4Cs, typically Little-c's sphere of problem-solving or above. (However, a case could also be made for Mini-c's meaning-making domain). Conversely, when the potential for creativity is not fulfilled (for internal or external reasons), then one remains in a state of what Corazza describes as creative *inconclusiveness*, that is, the Hidden-c condition. In this view, educating for creativity becomes an effort aimed at promoting higher and higher levels of potential for originality and effectiveness, as well as the conditions that transform Hidden-c into some form of creative achievement (Ronald Beghetto and Giovanni Corazza, personal communication, February 18, 2018).

1.7.1 Creative Self-Belief

Importantly, for decades, educators have asserted that teacher beliefs (such as all students are naturally creative) are more powerful than teacher knowledge. Xu (2012) sees teachers as "highly influenced by their beliefs" (p. 1397). Based on Xu's review of the literature, we know that teacher belief affects how educators define problems, make decisions, and even act. Because creative self-beliefs form at a

young age, these tend to stay the same, she contends. However, they *can* change when individuals are exposed to enriching opportunities for expressing creative behaviors, a conception that deserves more development and testing.

Quite possibly, before human beings can creatively and dynamically generate meaning, problem-seek, and problem-solve—let alone contribute to professions or the world—they must believe in their potential for creativity. Self-belief, also creative self-belief, is rooted in the long-established concept of *creative self-efficacy* (the "perceived confidence to creatively perform a particular task") (Beghetto & Karwowski, 2017, p. 3). Creative self-belief can be explained as the "self-judgment about one's confidence to creatively perform an impending task at a particular level (e.g., 'I am confident that I can creatively solve three of these five problems')," which is "triggered [in] a performance situation" (Beghetto & Karwowski, 2017, p. 7). These creativity researchers also classify creative self-efficacy as a type of creative self-belief.

Beyond theorizing, there is empirical validation of the hypothesis that self-belief is fundamental to creative processes and probably the very capacity to be creative. For example, Beghetto's (2006) US-based survey study of 1322 middle and secondary students' judgments of their creative abilities advances the fundamental premise that "although creative ability is necessary for creative expression, it is not sufficient. Creative expression … seems to be influenced by self-judgments of one's ability to generate novel and useful outcomes" (p. 447). A possible interpretation of *self-judgment*, as Beghetto puts it—or Hidden-c from my perspective—is that it is both a catalyst for all creative endeavors—a form/level/type of creativity unto itself—and a shaping force that underlies the 4Cs. At all levels of creativity and across types, creators who persist with the doubts, uncertainties, and unknowns typical of long-term, complicated creative work may learn something valuable from failure. A Pro-C or even Big-C creative achievement signals success, but educative insight comes from firsthand knowledge of intricacies and dynamics.

1.7.2 Chinese Preservice Teacher Demonstration

Given this framework and study finding of creative self-belief, one might find it mysterious that the Chinese preservice sophomores I taught did prove to be creative (Mullen, 2017a, 2018). Despite feeling long suppressed (and overly regulated by test-centric curricula) to the point of believing they were uncreative, these education majors rose to the occasion. Within cooperative groups in a Chinese university's ministry-set general curriculum devoid of the liberal arts, students read, interpreted, and performed the basic 4C classification (Kaufman & Beghetto, 2009). In teams and alone, they produced writing and graphics signifying the four categories of creativity, in addition to unifying images of their homeland for which they felt proud (e.g., Confucius, a beloved teacher–philosopher). These undergraduates also creatively and collaboratively performed their achievements on our classroom's stage,

Fig. 1.2 A Chinese team's 3D paper poster rendering of the 4Cs (Mullen, 2017a)

complete with a microphone and homemade 4C props, and later for a live audience of leaders.

To demystify why creativity occurred in these paradoxical and impossible circumstances, I had conceptualized an original study and designed a learning environment that was a direct response to Niu and Sternberg's (2001) and Niu et al.'s (2007) research findings. Translating their two major takeaways at the level of practice, I endeavored to remove as many task constraints as possible within the Chinese classroom in favor of establishing a creative workspace and communicating directives to be creative. My expectations were articulated explicitly in the course titled Creativity and Accountability in Education. These carried through in my training of a bilingual teaching assistant and our English–Mandarin instructions accompanying all exercises and performance feedback.

In this Chinese course, students' creative products suggested dynamic creativity by way of Mini-c and Little-c collective immersion. The original products built upon the personal essays of creativity in the form of joint productions—3D paper posters representing each of the 4Cs, complete with an integrative image of all 4Cs (e.g., points of a compass, members' birthplaces) and an accompanying script (scroll) documenting decisions made (see Fig. 1.2).

Table 1.1 is an elucidation of this exhibit; the 4Cs are aligned with this group's associations with, and signifiers of, each of them. Adding to the 4Cs by integrating them is a request I made of my Chinese students. Building on the 4C model from

Table 1.1 Associations with the 4Cs in the Chinese team's 3D paper poster

4Cs	Signifiers of the 4Cs and integration
Mini-c	A three-wheel cart (with moveable wheels and handlebar) signifies an invention from childhood (upper right-hand corner)
Little-c	"Hot-pot," a culinary invention, solved the historic problem of seafarers feeling chilled (lower right-hand quadrant)
Pro-C	3D IMAX films, only discovered in 2008 in China, are mesmerizing young generations who may make their classrooms more creative (upper-left quadrant)
Big-C	A hydraulic engineering project of the Qin dynasty is a working irrigation infrastructure on China's world heritage list (lower left-hand corner)
Integration	Drawing a map of their birthplaces, students linked the 4Cs by way of their personal and cultural affinity with the cart, Hot-pot, films, and irrigation system

the standpoint of putting together parts or elements (e.g., 4Cs) and combining them into a whole facilitates the creative potential for higher-order thinking. An "ah-ha" moment for those immersed in creative work more readily results (see Table 1.1 under "Integration" and Fig. 1.2 for the mapping of birthplaces). With the support of these graphics, I am presenting integration as a new metacognitive idea relative to the 4C theory. I am also treating it as a pedagogic strategy for encouraging students' dynamic creativity and sense-making about this process.

In this preservice classroom, students' (inter)subjectivities and imaginations were stimulated cognitively and artistically, a process that Corazza (2016) identifies as intrinsically dynamic. Negotiating conceptions and representations, all cooperative groups moved from the intrapersonal (Mini-c and Little-c) to the professional/cultural (Pro-C), to the societal/global (Big-C), articulating examples of Pro-C and Big-C creativity rooted in Chinese culture.

Paradoxically, half of the students' essays on personal creativity expressed *not* being creative, echoing the stereotype (Mullen, 2017a, 2018). Some of these participants could not recall ever having had a creative experience. If they had, an adult or another external force had disrupted it. Brainstorming beyond their personal essays, teams generated novel creations connoting practical value. Self-reported was 4C curiosity, task engagement, and peer enjoyment, all outcomes associated with creativity (Kaufman & Beghetto, 2009). Students strongly preferred the group projects, not acknowledging that the self-reflective groundwork in creativity had originated with their individual essays. The teams had no avenue available for imitating or replicating the 4C model (e.g., consulting the Internet or samples), solidifying my conclusion that the class had evidenced high group creativity.

This course's rapid pace and brevity further suggested some level of self-confidence or perhaps shared confidence in creative risk-taking. Like the marginalized learners (e.g., girls, English language learners) in Beghetto's (2006) study, being at a disadvantage can challenge one's beliefs about the capacity for creativity. Because feedback from peers and teachers about one's ability influences creative self-efficacy, encouraging this can boost the most vulnerable student's learning. Influential authority figures and peers factor into creative learning experiences, as do perceptions. Contextual dynamics (e.g., teacher acceptance) can bring about

feelings of belonging (Beghetto, 2006), which in the Chinese classroom was evidenced as a feeling of communal bonding and friendship arising from a safe space for taking creative risks and expressing oneself individually and as a group.

Focusing on "domain" and "field," Csikszentmihalyi's (1996) model serves as a reminder that influential forces, visible and invisible alike, constantly exert influence. Within classrooms, the teacher is a gatekeeping force upon which seen and unseen forces wield power. On the scale of a field or domain, gatekeeping by expert peers who evaluate the quality of products (e.g., manuscripts) is a deciding factor in what counts as a creative contribution. Such real-life dynamics can affect anyone's creative self-efficacy, motivation, doubt, and even desire to persist.

Situations in which creativity is blocked do not necessarily negate being creative and in fact can strengthen one's resolve and thus capacity to be creative (Beghetto, 2006). Some creators do persist with creative challenges, even changing their circumstances and courageously modeling what is possible. While socialization or circumstances might inhibit the development of positive creative self-beliefs, individuals might find they can perform creative tasks where energized and modeled or imposed and scaffolded (Mullen, 2017a, 2018). A teacher's explicit instruction to be creative or innovative is one such opportunity.

It follows that creative self-belief and new learning indicate both paradox and possibility in restrictive environments. Within this Chinese preservice teacher classroom, Hidden-c surfaced as a creative force in students' learning performances. Undergraduates were placed in a novel situation—their classroom was a small theater organized into a work studio with round tables. The curriculum, developed and taught by myself, an American professor, was organized around project-based learning within cooperative groups and steeped in a collectivist orientation (Mullen, 2018). However, I did not known at the time if the piloted curriculum, experiential conditions, and new activities for fostering creativity would in fact stimulate creative thinking and yield creative products or overall success.

1.8 Takeaways, Implications, and Possibilities

Future directions for theory, research, and practice emerge from this layered treatment of creativity ideas. Dynamic creativity was my focus, with creative self-belief brought into the mix and extended to Hidden-c. A vignette of Chinese creative learning and collaboration was featured to demonstrate the 4Cs. I added the concept and practice of integration to the 4C model.

1.8.1 Dynamic Creativity in Hindsight

Dynamic creativity—the central construct herein—was introduced as a new concept (besides Hidden-c), which I illustrated with examples. This key sense-making device allowed for the exploration of select influential theory and generative possibility. A speculation was that dynamic creativity involves generative possibility on many different levels, from adaptive and flexible learning to the changing self-beliefs of individuals and nations.

Hopefully, something intriguing has been conveyed about complex, dynamic interplays of creativity among individuals, systems, and cultures. Certain understandings underlying this writing are that creativity can be operationalized in experiential terms through "creative activity and creative products" and that creativity relies on "the judgment process" and "who the judges are" (Corazza, 2016, p. 259). Vital to this picture are attitudes of possibility in expressing and manifesting creativity, as the various life systems' examples and cases suggest.

1.8.2 Hidden-c's Creative Potential

Also presented was the emergent idea of Hidden-c, with grounding in the creativity theories of Kaufman and Beghetto (2009), Csikszentmihalyi (1996), and Corazza (2016). While perhaps an extension of the 4Cs theory, the generative possibility of Hidden-c was more a demonstration of dynamic creativity along the lines of Corazza's thinking. The life systems interpretation of Csikszentmihalyi's (1996) creativity framework also served to advance dynamic opportunities for thinking about different kinds of systems in which creative learning is essential for adaptation and growth. Notably, the creative synthesis of Kaufman and Beghetto's and Csikszentmihalyi's models may provide creative openings for readers to rework or even apply the idea.

What does Hidden-c suggest? Based on viewpoints ventured, Hidden-c may facilitate creative thought and action for which the belief in oneself as a creative being is a generative force. Dewey (1934) teaches that the human condition through which creativity manifests must not be lost—everyday creativity borne out of circumstance and conflict should be part of any cultural story. For Eisner (2004) too, creativity is the soul of the human condition. Creative schools catapult creative teaching and learning, potentially adding capital to creative societies. Leaders of school systems with a creative trajectory need frameworks to serve their purposes. Kaufman and Beghetto's, Csikszentmihalyi's, and Corazza's theories can be utilized for systems and cultural change.

1.8.3 Creative Self-Belief Emergence

While not focused on teacher and learner beliefs, this writing has implications for study of this area. As explained, a finding of Niu's breakthrough studies is that Chinese students' reduced creativity likely reflects their culture, environment, or context rather than any natural ability to be creative (Niu & Sternberg, 2001; Niu, Zhang, & Yang, 2007). Significant interferences with the creative process from youth can condition preservice teachers and other adults to believe they have a deficiency in creativity. Consider the scale of this problem for students wanting to teach who will in turn influence the young. Not only is this self-belief a serious hindrance for the preservice teacher but also for societies struggling to adapt and excel in the creativity economy.

Theory-building about dynamic creativity could enrich the self-belief construct with study of how nations understand their capacity to be creative and reflective. Entire nations as living systems possess dynamic creativity, including generative regimes. Imagine such ideas in the worldwide community of creativity scholars capable of addressing creative self-belief on the scale of nations and their influence on personal, professional, and eminent creativity! In effect, new insights into creativity could emerge on an entirely new level that, specific to Hidden-c, affect people's belief in their capacity to contribute creatively something larger than themselves.

1.8.4 Chinese Creativity Case

Another takeaway is that creativity is *not* limited to a particular application. A universal application, creativity, like good teaching, is integral to all learners. Seeds for creative learning, growth, and transformation were contained in the Chinese case, with China's particular ways of relating to the world's high-stakes testing ethos and opportunities for creative innovation. In fact, the rich illustration of China's collective strengths evidenced in classroom creativity sheds light on the larger narrative of dynamic creativity. Dynamic creativity makes possibility palpable—breathing life into education—no matter the circumstances and beliefs.

1.8.5 A Final Word

Readers may choose to adapt any of these ideas to inform their own theories, studies, and pedagogies. My hope is that this discussion about dynamic creativity, with application to influential theory and generative possibility, offers something of value. Hidden-c's creative potential may be worth developing and mining in new contexts that spur dynamic creativity.

1.8.6 Author's Notes

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