



The Arts, Creativity, Cognition, and Learning: A National Endowment for the Arts Research Lab

**Working Paper:
Literature Review in Preparation for a Nationally
Representative Survey about Creativity and the Arts**

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TABLE OF CONTENTS

INTRODUCTION	3
DEFINING DIMENSIONS OF CREATIVITY	4
Novelty & Usefulness	5
Problem-finding	6
Caliber	7
Domains	8
SELF-PERCEPTIONS & IDENTITY.....	12
Personality	14
Environment	16
Process	19
MEASURING CREATIVITY	20
External Perspectives	21
Internal Perspectives	22
Response Scales	24
NEA RESEARCH LAB: Project #1 Research Questions	25
Works Cited.....	28

INTRODUCTION

Understanding how to foster, measure, and encourage creativity is a topic that cuts across many social arenas, including education, workforce, the economy, and urban and community development. Consequently, unpacking how creativity works and how it is expressed on the individual level is a prevalent, multidisciplinary research priority. “Creativity” can be conceived of in various ways and examined from a variety of different perspectives, all centered on individuals. A 2014 National Endowment for the Arts (NEA) convening and subsequent report, entitled *How Creativity Works in the Brain* (Gute and Gute 2015), examined creativity from the perspective of neurobiology, the analytical focus being on the actual inner biological and psychological workings of individuals who exhibit creative behaviors. A second research perspective examines differences in how individuals express their personality, motivations, and talents. A third perspective focuses on the social, encompassing a range of approaches to examine how individuals behave creatively and understand their creativity in relation to their own social location. In the present literature review, we consider perspectives focused on understanding individuals’ expression of creativity, as well as social levels of analysis.

This literature review provides an overview of conceptions for defining creativity, elements of how self-perceptions of creativity are understood and currently debated, and approaches to the measurement of social levels of analysis of creativity. The purpose of the literature review is to contextualize this NEA Research Lab’s research questions and inform its research instruments. We begin our review by looking at definitions of creativity before

discussing different domains in which creativity may manifest. Next, we review literature around the presentation of creativity as an element of identity, looking specifically at perceptions of the self as a creative individual, as well as potential environmental factors influencing creative expression. We conclude the literature review with a brief presentation of the various ways creativity has been measured.

DEFINING DIMENSIONS OF CREATIVITY

Definitions of creativity are numerous and multi-dimensional. Though different scholars prefer semantically different definitions of creativity, broad consensus around requisite elements for these definitions already exists. Thus, new or revised definitions of creativity should be devised and implemented primarily with research frame and design in mind. At minimum, it could be stated that creativity is understood as a trait which refers to the “production of novel and useful ideas” (Scott and Bruce 1994: 581). For our purposes, a nuanced definition of creativity which also considers the role of environment on determination of creative value is:

‘Creativity is the interaction among aptitude, process, and environment by which an individual or group produces a perceptible product that is both novel and useful as defined within a social context’ [Plucker et al. 2004: 90]. In other words, creativity is the how (ability and process) and the where and when (environment) made by the who (individual or group) making the what (a specific product both new and useful). (Agars et al. 2008: 7)

Novelty & Usefulness¹

A review of definitions across multiple bodies of literature provides contextual evidence for how the above definition came to be formed. Novelty and uniqueness are two key dimensions of creativity, and often co-occur. Novelty means that the creative product or idea is original in its form, function, or approach to a task. Usefulness is the notion that the creative product or idea is appropriate to the task at hand, and may be implemented or exchanged in a way that makes a positive contribution towards goal-attainment. The selection of definitions that follows exemplifies the multi-dimensionality of these key characteristics in creativity:

- “...the sense of doing everyday things in new ways: **solving the problems of daily living and the world of work**, engaging in scientific or other research, writing, painting, developing music etc.” (Kumar and Holman 1997)
- “**Self-perceived creativity** refers to the extent to which employees perceive that **they produce new and useful ideas**...creative activities are goal directed and intentional (Shalley 1991)” (*in* Zhou et al. 2008: 400–401).
- “It must be original, it must be useful, or appropriate for the situation in which it occurs, and **it must be actually put to some use** [Martindale 1989, p. 211] (Sass 2001: 55).” (Plucker et al. 2004)
- “Creative ideas may be concerned with new products and technology or ideas about process improvement....**By definition, creativity...emphasizes the implementation of new ideas or practices.**” (Zhou et al. 2008: 400–401).
- “... **defined by making reference to the idea of novelty** and uniqueness” (Rubenstein, 2000, p. 2).” (Plucker et al. 2004)
- “... the ability to create is defined as **the bringing into existence of something new** (Hasse, 2001, p. 200).” (Plucker et al. 2004)
- “**Singaporean adults ... also associated uniqueness**, imagination, and art with creativity (Tan, 2000, p. 266).” (Plucker et al. 2004)
- “Wallach and Kogan's (1965)....**conceptualize creativity as the production of ideas that are abundant (i.e., ideational fluency) and unique (i.e., originality)**....” (Hocevar 1980: 25)

¹ In regards to research design, the decision to include “use” or “usefulness” as an element denoting the presence or absence of creativity may be influenced not by the fact that utility must exist in order for a solution to be creative, but rather because a significant portion of creativity research has taken place in the realm of work and organizational studies, where use, practicality, and efficiency are highly valued.

Problem-finding

Usefulness and novelty are often presented together in the literature as tools employed by individuals to contribute towards problem-finding, a third theme of interest for the Lab's research. Csikszentmihalyi (1988) defines creative thinking as "the ability to discover new problems never before formulated" (162). Creative versus standard problem identification can be differentiated primarily by "the core processes of combination and reorganization of category information as well as problem construction" (Lubart 2001: 302). When implemented, the resultant creative product or idea contributes to the cessation of the discovered problem, aiding in progress. Key descriptions of this theme include:

- **"...a comprehensive definition of creativity should incorporate the identification and definition of a problem or worthwhile task, and the generation, evaluation, application, and modification of solutions and ideas."** (Runco and Okuda 1988)
- **"...creativity must represent something different, new, or innovative (Baer, 1997; Sternberg et al., 2002). Second, for something to be creative, it must be appropriate to the task at hand. In other words, a creative response is useful and relevant."** (in Agars et al. 2008: 12)
- **"Managerial creativity is defined as the production by manager of new concepts ideas, methods, directions, and modes of operation, that are useful to the organization (Scratchley & Hakstian, 2001, p. 367)." (in Plucker et al. 2004)**
- **"Creativity was operationally defined as creativity ratings applied to students' proposed solutions to an engineering problem ... novelty combined with appropriateness, value or usefulness' (Fodor & Carver, 2000, p. 383)." (in Plucker et al. 2004)**
- **"Creativity may be viewed as the ability to form remote ideational associations to generate original and useful solutions to a given problem' (Atchley, Keeney, & Burgess, 1999, p. 485)." (in Plucker et al. 2004)**
- **"'... divergent thinking, the generation of new and possibly useful ideas' (Schuldberg, 2001, p. 7)." (in Plucker et al. 2004)**

The idea of appropriateness, particularly in terms of context, is important. A creative product or idea is useful, novel, and contributes to problem-definition/-solving most successfully when it is

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conceived of and implemented at the appropriate time and place; "...creative work is the outcome of a more or less pure form of discovered problem-solving process" (Csikszentmihalyi and Getzels 1971: 47).

Caliber

Another approach to defining creativity is based on the ways that the caliber of creativity is manifested and in which domain or domains of life it may occur, which is often categorized into four types: *Big-C*, *little-c*, *mini-c*, and *pro-c* (Kaufman and Beghetto 2009).

- Big-C creativity refers to creative genius or eminence
- Pro-c encompasses states of professional-expertise and progressions towards expertise
- Little-c creativity focuses on everyday works, such as problem-solving, committed by ordinary people
- Mini-c is more procedural, conceptualized as a means of capturing creativity as an inherent element of the learning process

A fifth "C" type, known as *middle-c* creativity, is discussed less commonly in the literature. The middle-c type encompasses impactful works created by individuals with some level of domain expertise. Similar in scope to Pro-c creativity, middle-c creativity "includes creative acts that have substantial social impact beyond the creative agents' immediate circle of acquaintances, but which do not transform entire fields or subfields," as do displays of Big-C creativity (Harrington 2004: 180).

The "C" types of creativity categorize creative expression in various developmental stages. Popular thought around how creativity is manifested has expanded from a sole focus on "big C" creativity – the notion of apparent creative genius and accomplishments in the artistic domain – to encompass "little c" creativity – the creative endeavors of any person that can be

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recognized in some manner by another person, and even “mini c” creativity – individual, private insights (Andreasen and Ramchandran 2012; Beghetto and Kaufman 2007; Kaufman and Beghetto 2009; Silvia et al. 2012; Silvia et al. 2014). Indeed, much of contemporary research in creativity studies assumes that creative thinking is “involved in all developmental transitions, whether of a mundane and common sort...or the more exalted sort” (Feldman and Gardner 2003: 143).

Domains

Different domains of knowledge imply the existence of different domains of creativity. How domains are understood has evolved over time (Kaufman et al. 2017). Domain has been previously defined in the literature as, “a unified structure that is rooted in culture,” a body of “disciplined knowledge that [has] been structured culturally and that can be acquired, practiced, and advanced through the act of creating” (Li and Gardner 1993: 95). Three parameters of limitation and constraints across domains are pursuit of domain, methodology of the domain, and symbol system of the domain (Li and Gardner 1993). The first parameter, pursuit of domain, encompasses the institutional logics under which new knowledge and products are developed. The second, methodology of the domain, “places a set of constraints on creativity in domains,” effectively setting the boundaries of accepted practice (Li and Gardner 1993: 98). The third parameter, symbol systems, refers to the cultural tools and objects individuals may use to pull references or inspiration from during the creative process. All three parameters relate to the recognition of common objectives and goal attainment. The exact nature of each parameter varies by domain, though Li and Gardner (1993) assert that every domain exists under similar constraints. From these parameters we can define domains

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The Arts, Creativity, Cognition, and Learning: A National Endowment for the Arts Research Lab

as arenas of specialized knowledge, each having their own cultural and institutional rules and practices, where familiarity with said rules and practices is required in order to claim proficiency or mastery within the domain.

An example of a domain is mathematics. In order to demonstrate proficiency in the domain of mathematics, an individual must be familiar with the various symbols used to denote directions within an equation, have knowledge of the rules and practices used to derive a solution, and understand the cultural conventions around showing and proving one's work. Should any of those elements- familiarity, knowledge, and understanding- not be present, the individual will not be able to engage productively with the domain of mathematics.

As James and Asmus (2001) note, "...creativity is multifaceted...different creative domains make different demands on individuals" (150). Psychological and sociological research has begun to advocate for and explore domains beyond the arts in which an individual can be creative. Baer and Kaufman (2005) have posited the Amusement Park Theoretical (APT) model of creativity, which includes domains of artistic, scientific, entrepreneurial, and problem-solving creativity. In an earlier 2004 study, Kaufman and Baer identified several other domains in which creativity may occur, including: interpersonal relationships, communication, solving personal problems, writing, art, crafts, bodily/physical, math, and science (Kaufman 2012). A later study found that perceptions of creativity could be described by three common factors: creativity in empathy/communication, "hands on" creativity, and math/science creativity (Kaufman 2012). Still, research suggests that the specialized knowledge inherent of a domain is a "primary driver" of creative assessment, as implied by the preparation stage of the creative opportunity

Domain knowledge assists individuals in the identification of creative ideas and opportunity. The need of specialized knowledge for generating domain specific creativity may limit the number of domains in which a single individual can exercise creative expression. Minimal domain exposure does not afford the individual enough opportunity to internalize, integrate, and transform pre-existing knowledge into creative product (Csikszentmihalyi 1996; Sawyer 2003). Mueller and colleagues (2014) refer to domain knowledge as “level of construal,” a person-level factor related to one’s ability to identify creative products in conjunction with environmental indicators. In focus groups, examples of environmental factors include being in open and accepting spaces which promote creative ability (de Souza Fleith 2000). High-level construal is associated with greater likelihood of being able to understand a problem solution as being novel, a primary element of creativity. Novelty in problem solving is identified primarily by the comparison of multiple possible solutions against each other, where individuals employ their domain knowledge in the judgement of each proposal (Mueller et al. 2014).

Pachucki et al. (2010) caution against relying too heavily on *a priori* defined domains of creativity, having found that individuals self-report creativity in routine social situations wherein they can, for example, nurture others or provide humor. Such a finding suggests that creativity is, in some capacities, as much about “community” and “connection” as it is knowledge, innovation, and expression (Pachucki et al. 2010: 140). People may be creative in areas not typically associated with the specialized knowledge base traditionally required of domains. Still, the social situations participants in Pachucki et al.’s (2010) study self-reported as

being creative opportunities do require knowledge of cultural norms, an element of domain proficiency.

Further debate around the concept of domain focuses on the benefits and applications of domain specific versus domain general creativity. Domain specificity argues that, in individuals, creativity manifests itself in an exacting fashion as opposed to generally. For example, in the broad domain of the arts, a specific manifestation of creativity would be creativity in performance art, specifically, as a single dimension of the domain, as opposed to the “arts” as the comprehensive, umbrella conception of the domain. The domain specific perspective parcels out the various dimensions found to occur within domains as broad, general arenas. In their study, Ivcevic and Mayer (2006) found that in three out of five creative types, people peaked on a single, specific dimension of creativity, as opposed to displaying creativity across multiple dimensions. Because creativity in specific dimensions of a domain is more common in the general population than broad creativity across dimensions of a domain, it has been suggested that scholars studying creative process must be more attentive to domain specificity in their research (Lubart 2001). A domain specific approach is better situated to our own research purpose, which is to test unifying features and relationships between domains and creativity within the dimensions of domains, particularly in the artistic, entrepreneurial, and social arenas, as observed within the general population. We believe that doing so will help us to inform translational research on matters related to equity.

SELF-PERCEPTIONS & IDENTITY

Depending on their specialization, psychologists may define creativity in terms of process, product, or as something characterized by a series of traits (Prabhu, Sutton, and Sauser 2008; Rhodes 1961). In the literature reviewed here, creativity is often represented as an action or process which inspires or leads to some sort of physical or metaphysical outcome, be it a thing or idea. Eysenck (1994) discusses the distinction between “creativity as achievement” and “creativity as a trait.” Eysenck (1994) describes creativity as achievement as demonstrable productivity, whereas creativity as a trait comes from individual disposition and internal motivation toward discovering and finding new things for themselves that – influenced by environmental and contextual factors, such as one’s education and socioeconomic status - may or may not translate into demonstrable achievements of novelty to others (208-209). To consider creativity as something characterized by a series of traits is to consider an alternative definition of creativity, this time originated by Hocevar (1981); “...creativity can be identified in terms of interests and attitudes. This approach is based on the assumption that a creative person will express attitudes and interests favoring creative activities” (451).

One approach to the study of creativity as an outcome is to determine if the individuals responsible for the outcomes are, themselves, creative. Role-identity theory posits that peoples’ actions are influenced by how they see themselves, and how they would like to be seen by others. In regards to creative role identity, creativity is a state defined internally by individuals, based on what they perceive as being creative (Petkus 1996). Creative identity is also influenced by how people understand the nature of creativity, as something that is either

innate or something that can be developed. As Karwowski (2014) found, “people who believe that creativity is conditioned by effort rather than an inborn quality tend to perceive themselves as more creative” (66). The taking on of a role-identity implies that the individual has attached a positive affect to the identity, which is enforced by the degree of role support and verification the actor receives from others (Petkus 1996). A person who plays and maintains a creative role-identity is more likely to receive reinforcement and support from others in regard to that identity than individuals who do not claim a creativity identity. People who operate within domains that value creativity may be more likely to adopt a creative role-identity than people not operating within creatively oriented domains, due to the positive reinforcement creative behavior may garner (Wang and Cheng 2010). The receipt of adequate support in the development or enhancement of creative identity aids in the development of creative self-efficacy, thus leading to increased perceptions of competence and ability (Beghetto et al. 2011).

Theoretical considerations around creativity rest primarily between two types of theory: those that emphasize personality and cognitive abilities, and those that encompass cultural stimulation and motivational considerations (Reed 2005). Role-identity is thought to help “reconcile the self-views of the individual with the perceived views that others hold of him or her” (Wang and Cheng 2010: 109). The ability of creative individuals to “give feedback to themselves, without having to wait to hear from experts,” is a key element of Csikszentmihalyi’s concept of “flow” (Csikszentmihalyi 1997: 10). In gaining creative self-efficacy, individuals develop a sense of agency within themselves by, “internalizing the field’s criteria of judgment,”

wherein one may recognize and perceive themselves as practicing creativity specifically, as opposed to generally, within domains (Beghetto et al. 2011; Csikszentmihalyi 1997: 10; Tierney and Farmer 2011). Though not discussed in detail here, to achieve flow indicates that the individual understands that they are operating creatively. A person operating in an “unresponsive society,” who receives insufficient feedback or little validation of their creative efforts, will have difficulty maintaining flow (Csikszentmihalyi 1997). As such, it can be said that one’s orientation within a group or arena of knowledge is a formative element in terms of role-identity and perceptions of the self, particularly in regards to the development of creative self-efficacy.

Personality

General consensus indicates that certain sets of personality traits are thought to be more indicative of creativity than others. Csikszentmihalyi (1996) attributes ten “apparently antithetical” umbrella traits to creative individuals, which demonstrate the complexity of the creative personality (57). In Csikszentmihalyi’s (1996) observations, creative individuals:

1. “...have a great deal of physical energy, but they are also often quiet and at rest.” (58)
2. “...tend to be smart, yet also naïve at the same time.” (59)
3. display “a combination of playfulness and discipline, or responsibility and irresponsibility.” (61)
4. “... alternate between imagination and fantasy at one end, and a rooted sense of reality at the other.” (63)
5. display tendencies both towards extroversion and introversion, expressing both traits at the same time.
6. “...are also remarkably humble and proud at the same time.” (68)
7. “...to a certain extent escape...rigid gender role stereotyping.” (70)
8. “...are thought to be rebellious and independent.” (71)
9. “...are very passionate about their work, yet [can be] extremely objective about it as well.” (72)

10. are open and sensitive, exposing them to “suffering and pain yet also a great deal of enjoyment.” (73)

A more recent, five-factor model identifies a series of traits associated with the ability to engage in creative process, those being: conscientiousness, openness to experience, agreeableness, extraversion, and emotional stability (Taggar 2002). As a model of personality traits, Taggar’s five-factor model is associated with “antecedents to creativity at the broadest level,” and is thought to influence relationships with base requirements for initiating creative process, such as task motivation (Taggar 2002:317). The Intrinsic Motivation Hypothesis of Creativity states that, “the intrinsically motivated state is conducive to creativity, whereas the extrinsically motivated state is detrimental” (Amabile 1996: 107). In the social psychology literature, intrinsic motivation refers to an activity that the individuals engage in because of their own interest. Amabile (1996) presents intrinsic motivation as a stimulus to problem-finding, arguing that creative reactions to problem identification require that the individual first find the problem worthy of their engagement. McClelland’s theory of motivation similarly captures this perspective (1961). Concerning creativity in entrepreneurship, for example, need achievement leads to gratification from undertaking tasks which involve moderate risk-taking and taking personal responsibility for the outcome.

In regards to specific characteristics, Prabhu et al. (2008) found that personality traits related to self-efficacy, intrinsic motivation, and, again, openness to experience were all significantly and positively associated with creativity. Ivcevic and Mayer (2009) are in consensus with Prabhu et al. (2008) and Taggar (2002), having found that openness to experience, in particular, is related across a variety of different dimensions of creativity, specifically life-style,

intellectual achievement, and the arts. In terms of consensus, openness to experience has been frequently cited for its association with creative achievement (Kaufman 2013).

James and Asmus (2001) argue that, “particular personality clusters and particular cognitive skills are thought to be differentially effective” across domains, citing a study by Osche (1990) which found that, “social independence and even social maladjustment may be predictive of creativity that is more object or abstract based, but less so of creativity that involves a substantial collaborative or persuasive element” (*in* James and Asmus 2001:150). For scholars, intrinsic motivation, risk-taking, and divergent thinking were traits strongly predictive of creativity, differentiating them from other creative types for whom the predictive power of those traits was not as strong, thus further supporting arguments for domain-specific creativity (Ivcevic and Mayer 2006). Though James and Asmus (2001) indicate that not all creative pursuits across domains require collaboration, it is critical to note that, “certain group memberships and personality traits influence the development of specific kinds of creativity” (Ivcevic and Mayer 2009: 164). As such, environment, as well as personality, influences creative behavior (Sawyer 2003).

Environment

Recent literature has considered the role of environment in influencing creativity both in terms of the individual as a creator, and the product as a creative solution. In reference to our own research, environment is indicative of space and time- referred to by Agars et al. (2008) as a matter of “where and when”- as well as social location (7). Individuals located within groups that acknowledge or contribute to the development of their creativity are more likely to develop creative self-efficacy, making them more likely to practice a creative role identity than

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individuals not operating within a similarly supportive social environment (de Souza Fleith 2000; Wang and Cheng 2010). Supportive social environments for creativity may vary drastically in scale, ranging from the family and home environment to urban-based creative and cultural development policies. In the larger urban context, Florida's (2002) creative city concept has been instrumental in the development of "creative friendly" policies, including street and music festivals, funding for public arts, and amenities growth, though the exact impact of such policies on individual-level creativity is unknown (Grodach 2012).

Not all individuals have access to environments capable of supporting creativity. Barriers to creativity and creative expression are often considered in domain-specific terms. Generally, barriers to access include wealth, capital, education, proximity to and availability of designated creative spaces, and job constraints. However, such is not always the case. In the general domain of work, bureaucracy may preclude creativity. If that is the case, barriers to creativity come down to the degree of autonomy afforded workers in their attempts to self-manage or derive creative opportunity for themselves, particularly when it has not been afforded to them (Pagis and Ailon 2017). Even jobs within the creative sector present with barriers to creativity, most notably in regards to the precarious and project-based nature of creative sector work (Umney and Kretsos 2015).

Though barriers to creativity are important to consider, relatively few studies have taken environmental and other socio-cultural factors into consideration when studying proclivity and approaches to creativity. Amabile et al. (1996) notes the importance of "resources" in the pursuit of creativity, stating that having access to relevant resources impacts

both high and low creative processes, particularly in the context of work. Originally identified in the context of the workplace, additional stimulants to creativity found by Amabile (1996)

include:

1. Freedom – having agency or control over one’s work and ideas.
2. Good project management – includes skill matching, having a sense of project direction, and relief from outside distractions.
3. Encouragement – having ideas be met with enthusiastic response.
4. Cooperative organizational climate – similar to encouragement, being located in an environment which praises innovation and allows for failure.
5. Recognition – to believe that the produce will receive relevant feedback.
6. Time – sufficient time to explore different perspectives, to think.
7. Challenge – the problem and action of creativity is intriguing to the creator.
8. Pressure – a sense of urgency which may be generated internally or from an external agent.

Several positive environmental indicators, including encouragement, cooperative climate, and recognition, are related to the idea that creative individuals despite their own self-efficacy and freedom in performing creativity, are at least partially affected by their social location.

Morais et al. (2014) reference barriers in terms of individual personality traits, including inhibition/shyness and lack of motivation, environmental factors such as lack of time or opportunity, and social repression, including lack of support in developing creative potential. Glăveanu’s (2013) framework situates the creative actor within a “field of social relations,” where the actor is a socialized being and therefore “necessarily defined by a system of social relations and cultural traditions regulating these relations” (72). Here, again, creative self-efficacy and the ability to exercise agency within the creative process are influenced by the degree of freedom allotted the individual within their environment. Our research acknowledges

that in influencing the creator, the sociocultural environment also impacts the creative product, something that is itself “a product of cultural participation” (Glăveanu 2013: 74).

Process

De Souza Fleith (2000) defines creative process as one which involves “an original way to produce unusual ideas, to make different combinations, or to add new ideas to existing knowledge” (148). If, as the literature indicates, the primary roles of creativity are to introduce novelty and engage with problem solving, then the ability of individuals to recognize creative opportunity is a critical first step. Creative engagement is often conceptualized as a series of actions occurring in four or five stages. The four-stage model, originally conceived by Wallace in 1926, identifies the following points involved in the recognition of creative opportunity (Lubart 2001):

1. Preparation – draws on knowledge, analytical skills, and education, including training.
2. Incubation – unconscious work on a problem, often during moments of relaxation, or “breaks.”
3. Illumination – enlightenment, when the “promising idea breaks through to conscious awareness.” (296).
4. Verification – idea development, refinement, and evaluation

Botella and colleagues present a contemporary six-stage model of creative insight and discovery, which captures the relationship “‘in between’ space of creator and environment, creator and society” by acknowledging how each affects and is affected by the other (2013: 162). The six-stage process of creative insight and discover includes:

1. The initial idea or vision - ideas may be general in nature and develop into specificity in subsequent stage.
2. Documentation and reflection – similar to the incubation stage as noted by Wallace (1926), a time to gather information regarding the tools, techniques, and materials the creative project may require.

3. First sketches and attempts – formulating models of the project using a range of mediums.
4. Testing of preliminary works – testing the products of the previous stages, perhaps for an extended period of time, developing knowledge of how the materials react in a “real” environment.
5. The production of draft and “almost-finished” products – detailed work conducted with the intention of bring the product closer to perfection.
6. Production of variations, objects in series, and product finalization – an end point of the creative process, marked by emotional response from the creator and others.

As indicated, the model derived by Botella et al. (2013) emphasis the iterative element of creative process, whereas the model originally conceived by Wallace (1926) presents creativity as having linearity. Though presented as stages, research consensus indicates that the creative process is not necessarily a step-wise, ordered procedure in practice. No step may be defined by boundaries. Phasing is thought to occur between actions in the creative process model, as well as between stages in the creative insight and discoveries model. Verification, including idea development, requires the same knowledge and analytical skills as the preparation stage. Suggested enhancements to the four-stage model focus on distinguishing between stages, specifically between preparation and preliminary idea generation and problem finding and identification (Lubart 2001).

MEASURING CREATIVITY

Just as there are multiple dimensions to creativity there are multiple approaches on how to operationalize its measurement from a social science perspective. In her review of the social psychology of creativity, Amabile (1996) notes that creativity is well-studied with a holistic approach, citing a study by Simonton which employed a wide range of individual, social,

cultural, and even political indicators. Broadly speaking, creativity can be measured from an ‘external’ perspective and from an ‘internal’ perspective, meaning self-reports of creativity.

External Perspectives

External perspectives include objective binary measurement of behaviors, whether someone did or did not do something, such as measures commonly applied to the caliber of creativity for Big-C and Pro-C creativity (Gough and Heilbrun 1965; Runco et al. 2010). The Creative Achievement Questionnaire (CAQ), developed by Carson et al. (2005) and designed to capture Big and Pro-“C” creativity, measures creativity across ten domains: visual arts, music, dance, architectural design, creative writing, humor, inventions, scientific discovery, theater and film, and culinary arts (Silvia et al. 2012). To capture domain-specific creativity, the CAQ allotted 8 survey items per individual domain, thus allowing researchers to tally and sum the number of domain-specific response items endorsed by respondents. Another popular approach to measuring external perspectives of creativity is to ask respondents to subjectively evaluate the creativity of others, particularly in the workplace and learning environments, such as the classroom (George and Zhou 2001). Amabile’s (1996) consensual assessment technique (CAT) is one such measure, where qualified judges who possess relevant domain knowledge assess the products and ideas of others, including novices, in order to evaluate their level of creativity. Manager and supervisor evaluations of employees’ creativity have been used to identify organizational creativity, encompassing acts of innovation that improve workers’ productivity in the workplace. Other examples of creativity research designed around authority figures’ perceptions of others’ creative activity include teachers’ evaluations of their students and parents’ evaluations of their children (Runco et al. 1990).

Internal Perspectives

Similar to other research using self-reported data, self-reported measures of creativity are based on two assumptions, the first being respondents' willingness to report their self-perception of their own creativity with both accuracy and objectivity (Reiter-Palmon et al. 2012). The researcher must trust the respondent to avoid the pitfalls of social desirability, and answer in a manner that best reflects their real, lived experience with creativity. The second assumption is that participants understand what is being asked (Reiter-Palmon et al. 2012). If creativity is not clearly defined, participant misconceptions around the scope of the question, such as, what counts as creativity versus what does not, or misunderstanding around what elements of creativity- as personality, as a value system, or as an action- are of interest, will have a negative impact on accuracy.

One approach is to investigate whether and how people perceive of their own identity and see themselves in general – do they generally self-select traits that are thought to be indicative of creativity (Petkus 1996)? Self-reported personality checklists are a means of allowing respondents to identify traits and behaviors most descriptive of themselves, enabling researchers to evaluate traits most directly related to creative behaviors based off of the respondents' choices. Creativity researchers have implemented personality trait and behavioral checklists to measure creativity as both something inherent and actively produced. Personality trait and behavioral checklists are often, but not always, presented in the literature as items that are “true/untrue,” where respondents are asked to simply affirm or deny that certain characteristics define either them, or their relationship with creative acts. More recent

instruments allow respondents to rate their relationship to a characteristic on a multi-point scale.

Another approach is to inquire about one's own self-perception of domain-specific creativity. This approach needs to consider the variety and typologies of domains in which creativity occurs in balance with a feasible data collection instrument. Respondents may understand themselves to be creative only in certain, isolated capacities, be it at home, at work, in social environments, or, in a traditionally artistic sense. Kaufman's Domains of Creativity Scale (K-DOCS) was developed to "create a self-report, report, behavior-based creativity rating scale that reflects a domain-specific perspective of everyday creativity" (Kaufman 2012: 299). The stated goal of K-DOCS was achieved by having participants rate their creativity in 94 different creative behaviors, including: "creating a tasty meal out of scattered leftovers," "analyzing an argument," "composing an original song," "thinking of a new invention," and "decorating a room" (Kaufman 2012: 301–2). Five factors of self-rated creative behavior were identified from the 94 items: self/everyday, scholarly, performance, mechanical/scientific, and artistic. In regards to personality characteristics, only one factor, mechanical/scientific, was found not to correlate with openness to experience (Kaufman 2012).

Hocevar's Creative Behavior Inventory (CBI) was designed to identify "activities and achievements which are considered creative by the laymen, and then to develop a creative behavior inventory around these activities and achievements" (1979:2). Six sub-scales were generated from a participant-guided behavioral inventory, with items being divided into creativity in the fine arts, crafts, literature, music, performing arts, and math-science. In

Working Paper: Literature Review in Preparation for a Nationally Representative Survey about Creativity and the Arts (as of 2/6/18)

The Arts, Creativity, Cognition, and Learning: A National Endowment for the Arts Research Lab

developing the CBI, Hocevar concluded, "...the activities and achievements measured by the creative behavior inventory demand expertise and are recognized by society as being creative"

(1979: 5). Thus an important note regarding the CBI is that creative behaviors may be

population specific, depending on respondents' cultural or social situations. Act-frequency

scales of creativity reflect this sort of environmental dependence. Similar to the CBI, the act-

frequency approach uses items generated by lay people as a means of defining behaviors. In

this approach, participants are asked to list a number of activities which they believe reflect

instances of creativity or creative expression. A creative person will engage in more acts than an

individual who is not creative. In her study of everyday versus artistic creativity, Ivcevic (2007)

employed the use of act-frequency to help determine that everyday creativity, as opposed to

artistic creativity, occurs rather commonly in the general population.

Ultimately, survey design should reflect the variety of domains in which a respondent's creativity may manifest so as not to alienate respondents whose self-concept of their creativity is limited (Reiter-Palmon et al. 2012).

Response Scales

Items used to measure creativity are typically constructed for the purpose of being scaled during analysis. Over ten composite measures of creativity have been identified and

used in the creative research community thus far. Composite measures rely on concept

definition to ensure that all items in the scale are cohesive, coherent, and capturing the same

underlying concept. Cronbach's alpha is a popular estimate of reliability used to judge the

appropriateness of bringing together a combination of individual items to measure the same

construct. In creativity research, the Cronbach's alpha of composite measures created for use in

Working Paper: Literature Review in Preparation for a Nationally Representative Survey about Creativity and the Arts (as of 2/6/18)

The Arts, Creativity, Cognition, and Learning: A National Endowment for the Arts Research Lab

publication has ranged from .70 (Kumar and Holman 1997) to .96 (George and Zhou 2001).

Observationally, composite measures of creativity are primarily domain based, though some instruments, like the CAQ, use domain scores as a means of computing a total creativity score.

Researchers have attempted to differentiate between different domains and applications of creativity first by identifying these domains factually as separate constructs, and then by pulling and compiling the factors thought to be uniquely associated with each. In addition to factor analysis, researchers may employ latent class analysis, a methodology which groups study participants by identifying commonalities in their patterns of creative accomplishment (Silvia et al. 2012). Though factor analysis is thought to be more practical, latent class analysis is useful when seeking to provide evidence of domain-specificity.

NEA RESEARCH LAB: Project #1 Research Questions

Creativity has long been associated with the arts – particularly the notion of the rare, extraordinary artistic genius (Pachucki et al. 2010; Reiter-Palmon et al. 2012). Research on individuals' creativity has broadened in two important ways: nuancing the manifestations of creativity, and broadening the “domains,” or arenas of knowledge, in which creativity can be exercised and applied. Domains are nuanced into domain-specificity, with psychological research expanding from measuring ability and behavior to also measuring self-perception (Kaufman 2012; Reiter-Palmon et al. 2012; Silvia et al. 2012). Perception of self plays an important role in cognitive processes, affecting both personal decisions and community as people exercise their beliefs about their abilities and personality traits when making a range of choices, such as choosing leisure activities, careers, and relationships (Silvia et al. 2012).

As our understandings of creativity have expanded, so too have conceptualizations of artists. Artists are more readily being recognized as entrepreneurs and agents for social change, as well as for their contributions to community change and development (Lingo and Tepper 2013; Markusen 2014; Rosario-Jackson et al. 2003; Bell and Oakley 2015; Cornfield 2015). There has also been a collective broadening in the understanding of what it means to be engaged with artistic participation and forms of expression, and advances in how to measure these activities (Brown et al. 2008; Novak-Leonard et al. 2011; Novak-Leonard et al. 2014; Tepper and Gao 2008; Ivey 2008; Novak-Leonard et al. 2015). While forms of arts participation have traditionally been studied and measured as subsets of indicators used to understand the broader notion of creativity (Kirkpatrick and Romens 2015), research has often been aimed at understanding what *separates* arts participation from other domains, rather than focusing on the relationships and possible unifying features between them.

There are a multitude of approaches to studying creative behaviors, with some focusing on a small set of extraordinary individuals and their remarkable achievements (Pachucki et al. 2010), while others explore daily patterns of creativity in college student populations. Yet, when considering individuals' creativity and its connections and potential contributions to broader, more public and social arenas, such as strengthening communities, all individuals have a role to play.

The research aims of the Lab's first project - a nationally representative survey of adults - are threefold: 1.) to examine the relationship between creative domains, primarily the arts, and determine the degree to which and how this intersects with other domains of creativity; 2.)

Working Paper: Literature Review in Preparation for a Nationally Representative Survey about Creativity and the Arts (as of 2/6/18)

The Arts, Creativity, Cognition, and Learning: A National Endowment for the Arts Research Lab

to further examine the relationship between domains of creativity across a variety of demographic indicators; and 3.) to investigate the extent to which self-perceptions of creativity align with creative engagement and behaviors.

Our questions encompass individual and social levels of analysis of creativity by investigating individuals' self-perceptions of creativity as well as individuals' reports on how they socially, creatively, engage within their environments. The majority of creativity research has been conducted using samples of college students, eminently creative individuals, or people engaged with creative practices in the context of the workplace. Thus, information on how one's relationship with creativity and creative domains may vary across demographic and socioeconomic groups is limited. A primary goal of our research is to better understand potential differences by demographic and sociodemographic characteristics.

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