

CREATIVE METAPHOR PRODUCTION IN A FIRST AND SECOND  
LANGUAGE AND THE ROLE OF CREATIVITY

BY

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## **ABSTRACT**

The study of metaphor is an interdisciplinary endeavor crossing such fields as cognitive linguistics, psychology, and creativity studies. Two important conclusions on the nature of metaphor have been drawn to date: (1) the ability to use metaphor is a normal human cognitive ability and widespread in language; (2) metaphor is not a unitary construct and varies greatly from the highly familiar and conventional to the creative. Viewing metaphor as lying along a continuum, this thesis narrows the concept of metaphoric competence to creative metaphoric competence, which looks at this ability from a creativity perspective. In this thesis, it is hypothesized that creative metaphoric competence is an underlying competency, which is related to a more general creative competence, and therefore is projected onto both the L1 (Japanese) and L2 (English). In order to test this hypothesis, data from creative metaphor production tasks were collected in both languages. In addition, a number of creativity measurements were also developed with the aim of measuring the multifaceted nature of creativity. Relationships between these variables were investigated. Findings suggest that creative metaphoric competence is an individual difference variable, which could be described as a disposition towards novelty and is related to other measurements of creativity.

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## ABBREVIATIONS

CAT	<b>Consensual Assessment Technique</b>
CMT	<b>Conceptual Metaphor Theory</b>
CofM	<b>Career of Metaphor Theory</b>
CSC	<b>Coarse-semantic Coding Theory</b>
DT	<b>Divergent Thinking</b>
GSH	<b>Graded Salience Hypothesis</b>
FFM	<b>Five-Factor Model of Personality (Openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism)</b>
LH	<b>Left Hemisphere (brain)</b>
L1	<b>One's first language</b>
L2	<b>One's second language</b>
RH	<b>Right Hemisphere (brain)</b>
TTCT	<b>Torrance's Test of Creative Thinking</b>

## **Chapter 1 Introduction**

This study explores two intersecting and diverging bodies of research, metaphor and creativity studies. Both areas of research have matured and flourished over the past 30 years, yet this has often occurred in isolation from one another. Although metaphor has been frequently mentioned as being a mental process critical for creativity, especially as a means of conceptual combination (Finke, Ward, & Smith, 1992; Mumford & Gustafson, 1988; Ward, Smith, & Vaid, 1997), creativity research has not closely followed the more recent theoretical developments regarding metaphor and thought. This thesis therefore aims to fill this gap and to combine research from these interdisciplinary fields in order to better understand the process of creative metaphor production. In order to accomplish this, I examine whether or not this competence is an individual difference that is projected onto both a first language (L1) and a second language (L2). In addition, I also explore the relationship between *creative metaphoric competence* and other instruments that typically are utilized to measure the many different facets of creativity.

Metaphoric competence is a broad term that refers to an individual's knowledge of, and ability to use metaphor and plays a key role in one's overall communicative competence with the language (Littlemore & Low, 2006b). It has been hypothesized that metaphoric competence is an individual difference variable, which learners are able to transfer from a first language (L1) to a second language (L2), though research into this topic is still rather scarce (Littlemore, 2010). In this thesis, I narrow the term of metaphoric competence from the broad ability to use and comprehend metaphors to the ability to produce and interpret creative metaphors. It is important to make this distinction

for conventional and creative metaphors are processed differently, the former relies on semantic retrieval from the mental lexicon, while the latter requires conceptually exploring relations between distantly related concepts and then real-time mapping between these two concepts (see Chapter 3). However, since metaphor in natural language uses words to express meaning, there is needless to say, an overlap between metaphor and vocabulary knowledge. Past research has often used corpora to investigate the usage of metaphors in natural, everyday occurring language (Deignan, 2005) and more recently in a second language (see Nacey, 2013; Pitzl, 2011). Since many metaphors used in everyday language are not necessarily creative, but in fact are highly conventional and likely unconscious, in consequence, this thesis did not aim to measure such ability.

In contrast, being highly competent in producing creative metaphors relies on combinatorial abilities or the ability to bring two seemingly disparate concepts together in new and insightful ways. So in fact, conventional metaphors fall on a contradictory pole from creative ones for “when metaphors become routine or over-familiar they dull rather than sharpen experience, and they tend to inhibit rather than enable creativity” (Pope, 2005, p. 139). A number of methodological issues need to be addressed in order to compare *creative metaphoric competences* between a first and second language. This mainly has to do with designing a measurement instrument that does not reduce this competency to a vocabulary assessment and therefore it needs to be sufficiently open-ended whereby the participants can generate a wide range of possible responses.

In short, the aim of this study is to investigate how individuals produce creative metaphors through various prompts in an experimental setting. The goal is to look at creative metaphoric production and to examine this from an individual differences perspective. Therefore throughout this thesis, I clearly and carefully distinguish metaphor types in order to show that metaphor is not a unitary construct.

Moreover, I acknowledge that producing creative metaphors is an exceptional trait shared by all people (Carter, 2004), but at the same time differences in this competency between individuals is subject to variation. This everyday ability to generate creative metaphors is a highly creative act and as Miall (1987) suggests “the value of research on metaphor lies in the fact that metaphor shows on a small scale all the principal features of the thought processes that are most significant in creativity” (p.82).

Creativity and novel metaphors both harness the idea of surprise through seeing something in a new light, through creating connections between seemingly disparate concepts and “upsetting expectations” (Anderson, 1964). So this thesis has two main aims. The first one is to compare individual differences in producing creative metaphors in both an L1 and an L2; in this research these languages are Japanese and English, respectively. It is hypothesized that this is not simply a linguistic ability, but a cognitive ability that can be projected from one language to another. That is to say, if one has a disposition towards producing creative metaphors in the L1 this likely will also be projected onto the L2. In addition, it is hypothesized that this cognitive ability to produce creative metaphors in both an L1 and an L2 may be directly related to the more general individual difference of creativity. Creativity is best studied via a multifaceted approach

(Furnham & Bachtiar, 2008; Mumford & Gustafson, 1988; Ward, 2007) that looks at a creative product, but also considers the creative person, as well as, the creative process. The relationship between creativity and foreign language learning has been inconclusive (Albert & Kormos, 2004; Ottó, 1998), but as far I know, no research has examined the relationship between creativity and *creative metaphoric competence* in an L1 and L2.

In summary, this thesis contributes to the growing interest in novel figurative language production (see Beaty, Silvia, & Benedek, 2017; Chiappe & Chiappe, 2007; Vartanian, 2012;) and especially how this competency shows up in both a first and a second language.

## 1.1 OUTLINE OF THIS THESIS

This thesis describes an empirical study where participants completed different sets of tasks that aimed to capture *creative metaphoric competence* in an L1 and L2 and the multifaceted nature of creativity. The *creative metaphoric competence* tasks prompted the participants to perform certain metaphor production activities that were identical in format, but differed in content and language. One was in Japanese (L1 of the participants) and the other was in English (L2 of the participants). As for the first set of creativity tasks, these aimed to measure the creative person and past creative achievements through administering four questionnaires: a Big Five creative personality questionnaire, a broad creative personality profile questionnaire, a past creative achievement questionnaire, and a creative self-beliefs questionnaire. All of these were designed and developed by the author in Japanese for the purpose of this research. The second set of creativity tasks

included both verbal and non-verbal creative product tasks. The layout of the thesis is as follows:

In Chapter 2, I address how metaphor emerges in language through embodied experiences interacting with the world and how children develop the ability to comprehend metaphors in a first language. It is pointed out that this is a general cognitive ability that all children acquire at a young age, except those who have certain language impairments like autistic spectrum disorder (Rundblad & Annaz, 2010). I then shift the focus and discuss metaphors in a foreign language and the difficulties foreign language learners have with this type of language. In addition, I briefly review some approaches to teaching metaphors to foreign language learners. I conclude that most methods involve teaching conventional metaphoric language often found in multiword expressions like idioms and phrasal verbs.

In the third chapter, I argue that not all metaphors are the same and that it is crucial to distinguish between conventional and non-conventional metaphors for the two are processed differently. I explore three major approaches that distinguish creative metaphors from the more conventional and salient ones that are commonly used in everyday language: Conceptual Metaphor Theory (Lakoff & Johnson, 1980), the Career of Metaphor Theory (Bowdle & Gentner, 2005), and Graded Salience Hypothesis (Giora, 2003). I then provide a review of the literature within the field of neuroscience that has recently flourished that aims to discover the neuroanatomical mappings of figurative language processing. The purpose of this is to review research that shows how novel metaphors utilize different parts of the brain from conventional ones. This chapter

concludes by laying out a framework that narrows and distinguishes the broad construct of metaphors by way of their conventionality and novelty. The goal here is to show that metaphors exist on a cline from the conventional to the unconventional and making this distinction is crucial for this thesis since the goal of this thesis is to focus on only one type of metaphors, those that are novel, unfamiliar, and original.

In Chapter 4, I discuss creativity, as an individual difference, and develop a multifaceted approach to creativity that considers the creative person, past creative achievements, creative potential and the creative product. It is hypothesized that *creative metaphoric competence* is a creative act for both involve the momentary fusing of what is habitually considered two independent and incompatible concepts (Koestler, 1964). This chapter provides the background literature in how I developed the measurement instruments used in this thesis to measure the different facets of creativity.

In Chapter 5, I first describe a short pilot study that provided insight into the complications and limitations of conducting this research. From this study, I had to adapt and make some changes to the method and materials used in this thesis. In the second part of this chapter, I first provide background to how the various questionnaires that were used in this thesis were developed and made. In addition, I provide a description of the development of the specific instruments used to measure the creative products, such as the figural and verbal creative product tasks. In the final part of this chapter, I describe the development of the various tasks used to measure *creative metaphoric competence*, which include such activities as asking the participants to produce nominal metaphors, as

well as, numerous sentences that provide a certain amount of contextual support and prime the participants to complete them with a metaphor.

In Chapter 6, I describe the method used to conduct this research. This includes details about the participants, the setting where the research took place and the procedure in how I conducted this study. Moreover, I describe in detail how I scored the questionnaires and how I assessed the creative products, as well as, the creative metaphor production tasks through the use of the consensual assessment technique, as put forth by Amabile (1982, 1996).

Then in the first part of Chapter 7, I describe the results from the main study. First, I address the relationships found among the creativity instruments. I do a correlation analysis between the variables and then perform a multiple regression analyses to examine which variables show predictability for real-life creativity, as measured by a questionnaire that assesses past creative achievements. Then I investigate the relationships between the metaphor scores in the two languages. I look at both the differences between the scores between the two languages, as well as, correlations between all of the metaphor tasks. Finally I analyze the relationships between the creativity instruments and these metaphor tasks. In the second part of this chapter, I discuss these results. Here I mainly focus on the individual difference, a “need for novelty”, which entails inhibiting the conventional responses, risk taking, and conceptual reorganization when presented with a linguistic stimulus.

The final chapter (eight) provides an overall summary of the research. Implications of this study on creativity research and creativity in the language-learning

classroom are also considered. In addition, this chapter briefly discusses limitations of this study and possible avenues for future research.

## **Chapter 2 The Development of Metaphors in Language and the Individual**

Metaphor is a powerful tool that is widely used in many facets of everyday life.

Metaphors can be found in advertisements, lines of poetry, everyday talk of children in the schoolyard, and newspaper articles. The traditional view of metaphor, which viewed it as something isolated and exceptional, has greatly changed over the past few decades and now it is widely assumed to be a common and ordinary feature of language and thought.

In this chapter, I first provide some background to the study of metaphor. Then I examine one approach, called embodied cognition, which provides some explanatory insight into how metaphors emerge in language. This approach views metaphors arising from our sensory-motor experiences interacting with the world. Finally, I address how individuals develop the ability to use metaphors. In this section, I look at the ontogeny of metaphor from a developmental perspective in both an L1 and then an L2. Looking at it from a developmental perspective shows the messy trajectory of how one acquires this cognitive ability of producing and interpreting metaphors initially in a first language and then subsequently how it develops in a foreign or second language. It should be noted here that this does not take into account how bilinguals acquire this ability for this is beyond the scope of this thesis, since all the participants in this study were foreign language learners of English.

## 2.1 BACKGROUND TO THE STUDY OF METAPHOR

In order to delve into the workings of metaphor, it is crucial to first look at some terminology. Historically, I. A. Richards (1936) provided names to the two elements within a metaphor; the first is called the *topic* and the latter the *vehicle*. The *topic* is that which one is trying to talk about and the *vehicle* provides information on how to talk about this topic. So in the following metaphor, “our friendship is a fortress”, our friendship is the *topic* and a fortress is the *vehicle*.

In one early view of metaphor, called the substitution view of metaphor, it was believed that the metaphor could in fact be replaced by a literal expression, so that “understanding a metaphor is like deciphering a code or unraveling a riddle” (Black, 1954-55, p. 280). In the above example, one could replace this metaphor with the following literal statement, “our friendship is strong and protective”. According to the substitution view, metaphors exist on the periphery of language and should take more time to comprehend, since one has to “unravel the riddle” of the metaphor. Another view, which is often incorporated into this substitution view of metaphor, is the view that metaphor is an abbreviated simile or an implicit comparison between two things. So if I say, “college is a garden”, what I am really saying is that “college is *like* a garden”. In this example, one works out the meaning of the metaphor through a process of comparison and finding a ground of similarity between the vehicle and topic.

These theories held a few unquestionable assumptions at the time; firstly that the literal and metaphorical are clearly distinguishable categories and secondly that the

literal, as being intuitively more comprehensible, had priority over the metaphorical. In the following subsections, I address these assumptions and show how questionable they are.

### 2.1.1 THE THIN LINE: LITERAL AND NONLITERAL LANGUAGE

For a long time, the terms “literal” and “metaphorical” were perceived to be in stark contrast to one another. The word “literal” comes from Latin, “literals/literals”, which means “of or belonging to letters or writing,” from Latin *littera/littera* “letter, alphabetic sign; literature, books” similar in etymology to the word “letter”. In the 1590s, the word began to be used in the sense of “verbally exact”, as in the primary sense of the word<sup>1</sup>. So what is this “exactitude” or this primary meaning that exists in opposition to metaphors? If we take a basic word like “salary” and assume that it has the literal meaning “of a fixed payment for work” are we not overlooking the metaphorical origins of this word, which comes from the word “salt” (Cameron, 1999)? Or how do we account for polysemy in many words? For example, “garage” in British English may refer to a parking structure or a repair shop (Clark, 1996). Does one literal meaning have priority over the other?

According to the before mentioned view of metaphor, a metaphor creates a riddle and the literal provides the tools to solve it. This assumption that the literal is such a fundamental part of language prompted Gibbs (1994) to state, “we assume that there must be literal concepts and literal meanings in order for people to communicate successfully” (p. 26). This stark contrast between the literal and metaphorical is fraught with a number of problems and many literal expressions are in fact “dead” metaphors. Yet the vitality of a

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<sup>1</sup> <http://etymonline.com>

metaphor is really activated by the specific speaker within that specific moment of use and therefore is dynamic and dependent on the cognitive activation at the individual and contextual level (Müller, 2009).

One goal of Chapters 2 and 3 of this thesis is to argue that metaphors sit and move along a continuum. That is to say, some metaphors through use become more salient and entrenched in the mental lexicon of individuals and consequently move along this continuum towards conventionalization. For instance, on the one end are metaphors whose figurative meanings, due to their familiarity and conventionality, have lexicalized set units within the dictionary (e.g., “their dream was *crushed*”). On the other end are metaphors whose figurative meanings are freely compiled and due to their novelty and unfamiliarity are non-lexicalized and not a set unit (e.g., “their dream was *a drop of water on a hot stone*”). This idea will be further developed in Chapter 3. The point here, to return to the focus of this chapter, is to highlight the fact that when speaking of metaphor, some metaphors are more highly salient and prominent in language and therefore have more of a “literal” feel to them. Therefore all metaphors are likely not riddle-like, as indicated in the previous section, and as a consequence do not take more time to process than a literal sentence with equivalent meaning. This is further discussed in the next subsection.

### 2.1.2 PROCESSING METAPHORS: SECONDARY OR PARALLEL TO LITERAL LANGUAGE?

The Standard Pragmatic Model based on the work of the philosophers, Paul Grice (1975) and John Searle (1979) makes a clear distinction between the literal and the nonliteral (or figurative meaning) and subsequently ascribed priority to the literal meaning. Whether or

not the sentence has a literal or nonliteral meaning, the literal meaning of the utterance is obligatorily accessed first. If this literal interpretation is regarded as anomalous and without any discernable meaning in the context, the literal meaning of the phrase is discarded and then one attempts to seek out the figurative meaning in an additional optional stage. This multi-stage processing model views metaphor comprehension as requiring a greater amount of cognitive effort for it only occurs after the literal meaning is tested and then rejected. The main point here is that the literal meaning is automatic and a priori to the figurative meaning and this figurative meaning is the result of a so-called failure in appropriating a reasonable literal meaning to the phrase.

In contrast, a parallel-processing view (Gibbs, 1994; Glucksberg, 2003) holds that the literal and the metaphorical occur concurrently and thereby one does not have priority over the other. In this direct-access processing model, metaphors are comprehended directly without a literal interpretation, for the figurative meaning is extracted directly from the sentence through the available context. In one famous study, Glucksberg and colleagues (1982) used a similar style of test to the Stroop Test in order to see if people have difficulty rejecting metaphors as literally false. In this study, they prepared four types of sentences; literally true sentences, literally false ones, metaphors, and scrambled metaphors. The participants were asked to judge and then reject sentences that were literally false. They observed that it took people a longer time to reject the metaphors, to which they labeled this as the “metaphor interference effect”. They interpreted this interference as the result of both the literal and metaphorical meanings simultaneously being activated and concluded that the literal does not have priority. There has also been a growing consensus in the field that supports this parallel-processing view (Gibbs, 1984;

Keysar, 1989; McElree & Nordlie, 1999). Another crucial element involving metaphors is the question of why do people use metaphors in the first place. The next subsection describes why and how metaphors arise in language.

### 2.1.3 PLUGGING THE GAP: WHY DO PEOPLE USE METAPHORS?

According to the substitution view of metaphor, a literal statement of equal meaning can easily replace a metaphor, if this were true, then why do people use metaphors in the first place? Black (1962) presents a couple answers to this question. First there is the stylistic reason, which is firmly based on the idea that metaphor is a literary or rhetorical device, and the delight one experiences in finding the hidden meanings of the metaphor or solving the puzzle. The second reason is the pragmatic function of metaphors. That is to say, metaphors act as a linguistic tool to coin new terms for new concepts when there is a void in the language. For instance, with the invention of the computer, numerous metaphorical neologisms arose in the past half century such as; “web”, “mouse”, “cookie”, “firewall”, “worm” and so on. Black (1954-55) picturesquely states, “metaphor plugs the gap in the literal vocabulary” (p. 280). In essence, metaphors are “the major vehicle through which words acquire new or broader meaning” (Hock & Joseph, 1996, p. 228). So in essence, metaphors are essential in the ongoing expansion of language and therefore the substitution view of metaphor is untenable.

#### The Necessity of Metaphors

Ortony (1975) provides three theses that motivate people to use metaphors; the compactness thesis, the inexpressibility thesis, and the vividness thesis. In the compactness thesis, metaphors have the ability to densely pack a vast amount of

information using a minimal amount of language. The inexpressibility thesis, as previously mentioned, views metaphors as a key way to coin new words. Finally in the vividness thesis, metaphors are closer to and provide a more experientialist account of the situation and thus have emotive force. The vividness of the metaphor can arouse a mental image, rich in detail and closely linked to our perceptual and sensory experiences of the world.

In addition to Ortony's above thesis, others have also provided differing opinions on why people use metaphors. For instance, Cohen (1978) suggests that it is to achieve "intimacy" and the use of metaphors acts as a special invitation to the interlocutor and builds a close community much like a joke does. There is also a metaphor-to-theory relationship in the sciences where metaphors are instrumental for developing theories from Darwin to the cognitive revolution (Gruber, 1974; Thagard, 1992) for metaphors provide an easier, more graspable, and warmer vehicle to understanding an abstract notion (Feist, 2006). In education, metaphors are viewed as a heuristic for learning, as well as for teaching (Littlemore & Low, 2006a; Stevick, 1982). Metaphors also provide language to express the emotions (Kövecses, 2003).

In short, metaphors have various functions in language. One key aspect of metaphor is that it allows people to talk about abstract or less well understood concepts by comparing them to something more concrete or physical. In the following section, I outline a key theoretical argument in the cognitive sciences called embodied cognition. According to this view, which is far from having a singular viewpoint (see Wilson, 2002), but generally speaking, holds that cognitive processes are deeply linked to

sensory-motor systems and the body's interactions with the environment. A number of studies have provided support for this theory in regards to concrete concepts, but to a lesser extent for abstract language. This has been one major and unresolved issue in this field. One proposed viewpoint within embodied cognition theories is that abstract concepts are also embodied, which has been labeled the *Strong Embodiment* view of cognition. In this view, it is proposed that abstract concepts are understood through analogy to sensations and actions (Lakoff & Johnson, 1980, 1999; Gibbs, 2006).

Therefore metaphors emerge in language from our embodied interactions with the world around us. The theory of embodied metaphor seeks to explain how abstract thought is often bound metaphorically to a concrete concept. This is one aspect of the broad Conceptual Metaphor Theory view of metaphor, which is also discussed in this next section. In addition, I also present some controversies and support for this theory.

Understanding the embodied nature of metaphors sheds some light more generally on the emergence of metaphor in language.

## 2.2 EMBODIMENT: HOW METAPHORS ARISE IN LANGUAGE

Traditional models approach cognition as being amodal and disembodied (see Fodor, 1983; Lakoff & Johnson, 1999). This means that cognition functions independently from the sensory, motor, and emotional systems. This separate and encapsulated cognitive architecture manipulates symbols. Sensory, motor, and emotional information goes through a process called "transduction", where the information is transformed into a symbol that can then be easily manipulated through various cognitive processes (Pylyshyn, 1984). This model developed along with the development of the computer,

which is viewed as a “symbol manipulating device” and likewise the mind too, began to be viewed as having “symbol manipulating processes” (Newell & Simon, 1961). One of the major shortcomings of this approach is called the “symbol grounding problem” (Hanard, 1990; Vogt, 2002). This problem refers to the idea that if symbols are internal representations with which mental computations can be performed and consequently no longer are connected to any external information (sensory/motor), the meanings of the symbols are simply grounded in additional meaningless symbols. Yet they have to be about something, if not, one would be simply wandering lost from one meaningless *definiens* to another meaningless *definiendum* (Hanard, 1990 as cited in Jackson & Sharkey, 1996). So somehow these “symbols must be grounded, that is, relate to something other than additional symbols” (Glenberg, 2010, p. 587).

An alternative approach to cognition, one that views the mind as being both embodied and embedded in the world, has steadily gained momentum in the cognitive sciences. For Varela, Rosch, and Thompson (1991), cognition takes place “from having a body with various sensorimotor capacities ... that ... are themselves embedded in a more encompassing biological, psychological, and cultural context” (p. 172-3). Thelen (2000) explains how “cognition depends on the kinds of experiences that come from having a body with particular perceptual and motor capacities that are inseparably linked and that together form the matrix within which memory, emotion, language, and all other aspects of life are meshed” (p. 4). Likewise, Gibbs (2006), provides a lengthy description of embodiment in what he calls the “embodiment premise” emphasizing that “... Human language and thought emerge from recurring patterns of embodied activity that constrain ongoing intelligent behavior. We must not assume cognition to be purely internal,

symbolic, computations, and disembodied...” (p. 9). This embodied approach to cognition resolves the “symbol-grounding problem” and views higher order cognition as being grounded in the modal and action systems of the body.

A substantial amount of research confirms the embodied approach to cognition (see Barsalou, 2008 or Gibbs, 2006 for a review). A number of studies also provide empirical support for the idea that language, too, is grounded in sensory-motor systems (Aziz-Zadeh, Wilson, Rizzolatti, & Iacoboni, 2006; Hauk, Johnsrude, & Pulvermuller, 2004; Pulvermueller, Haerle, & Hummel, 2001), confirming what Gallesse and Lakoff (2005) affirmed, “language makes direct use of the same brain structures used in perception and action” (p. 473). Much of the current debate though involving embodied cognition and language revolves around abstract concepts, as Barsalou (2008) states, “Abstract concepts pose a classic challenge for grounded cognition. How can theories that focus on modal simulation explain concepts that do not appear modal?” (p. 634). Many others have likewise voiced this concern and have proposed a pluralistic approach that aims to combine embodied theories with disembodied symbolic theories (Chatterjee, 2010; Dove, 2011; Louwerse & Jeuniaux, 2008). This falls under the assumption that both modes of representation are necessary for cognition, as Machery (2007) frames the question, “[t]o what extent do we use reenacted perceptual representations in cognition and to what extent do we use amodal representations?” (p. 42). On the other hand, Glenberg and colleagues (2008) argue that the motor system is modulated during both concrete and abstract language comprehension and that understanding abstract action is based on understanding concrete actions. Clearly making a distinction between concrete and abstract words though can be rather difficult and controversial (Scorolli et al., 2011),

much like the difficulty of distinguishing the literal from the metaphorical (Gibbs, 1994). In the next subsection, I address this issue of concreteness and abstraction for it is key to resolve in order to better understand how metaphors emerge in language.

### 2.2.1 ANALYZING THE DIFFERENCES BETWEEN CONCRETE AND ABSTRACT LANGUAGE

Concrete words are words that one can experience through the senses such as physical entities (book, bicycle) while abstract words are considered to be detached from such physical references (idea, freedom) (Crystal, 2003). Hale (1988) provides some additional distinctions between these two entities; “abstract entities are not in space time whereas concrete ones are” ... “abstract entities have only relational properties while concrete entities have some intrinsic properties” ... “concrete entities are known by observation whereas abstract entities are known in a some other way” (p. 86-87). The question in this section is to try and answer what this “other way” is that allows us to know abstract entities.

Concrete words have been shown to have an advantage over abstract words, which is commonly known as the *concreteness effect*. This cognitive advantage appears both in lexical decision tasks, as well as long and short-term memory tasks (Paivio, Walsh, & Bons, 1994; Walker & Hulme, 1999). This concreteness effect is often attributed to differences in imageability, as developed in Paivio’s (1986) dual coding theory, or differences in context availability, as developed by Schwanenflugel and colleagues (1988, 1992). I briefly look in more detail at each of these theories below.

### Imageability: Paivio's Dual Coding

Paivio (1986) developed a dual-coding theoretical approach to human cognition that suggests there are two independent but interconnected systems, a verbal and nonverbal system. The verbal system works on linguistic codes and the nonverbal one works on imagery. According to this model, abstract and concrete concepts in language are processed similarly, as both use the verbal system, but differ insofar that concrete concepts are also associated with imagery and therefore utilize the nonverbal system. So the main difference between concrete and abstract words is the degree of imageability of the concept. Concrete concepts have rich imagery and this provides the concreteness effect. This has been empirically supported in a study where abstract concepts showed greater engagement of the verbal system, while concrete concepts showed greater engagement of the perceptual system during processing (Wang, Conder, Blitzer, & Shinkareva, 2010). From these results, the researchers suggest that this is likely due to increase mental imagery of concrete concepts.

### Context Schwanenflugel's Context Availability Theories

In contrast, the context availability explanation proposed by Schwanenflugel et al. (1988, 1992) argues that contexts are easier to imagine for concrete concepts than abstract concepts. As these rich and dense interconnections with other semantic concepts become available, the concrete concept is easier to retrieve. In other words, abstract concepts have less available contextual information in memory, thus causing them to be recalled less quickly.

In this subsection, I have outlined different theories that propose different processes involved in the understanding of concrete and abstract concepts based on imageability or density of contextual support. One shortcoming of these models is that they fail to take into account emotional or affective information. While concrete concepts may make use of more sensory-motor information, Kousta et al. (2011) suggest that abstract concepts make greater use of affective information and propose that “emotion plays an important role during language acquisition, providing a bootstrapping mechanism for the acquisition of abstract lexical concepts and their labels at early stages” (p. 25). Metaphors are frequently used in language to express emotional experiences (Fainsilber & Ortony, 1987; Kövecses, 2003) and they “allow us to conceptualize our emotions in more sharply defined terms” (Lakoff & Johnson, 1980, p. 58). So there is a tight link between abstract language, the affective system, and metaphor. In this case, metaphor is one such bootstrapping mechanism that allows people to abstract. For instance, the abstract psychological state of affection is conceptually linked to the physical state of warmth and spatial state of closeness. Moreover, it is not just emotional experiences that provide a mechanism to abstract, but the sensory and motor systems also play a role in abstraction (see Gibbs, 2006; Glenberg et al., 2008; Lakoff & Johnson, 1999). Therefore appropriate metaphors in natural language often use a concrete item as the vehicle to talk about some more abstract topic. I discuss this idea in greater detail in the next section.

### 2.2.2 THE BODY IN THE MIND: STRONG EMBODIMENT

To return to the before mentioned theory of embodied cognition, one controversial point is the differing views in how to explain abstract concepts. If abstract concepts are

completely decoupled from the sensory-motor systems, it then becomes less clear how it can be “differentiated from the more traditional approaches it seeks to displace” (Clark, 1999, p. 348). Using a symbolic approach for abstract concepts would also return the “grounding problem”. As a growing range of embodied theories developed, Meteyard and colleagues (2012) decided to lay them out on a continuum from secondary embodiment where semantic content is independent but associated with sensory-motor systems to weak embodiment where semantic content has partial dependence on the sensory-motor system to strong embodiment, which asserts that there is complete dependence on the sensory-motor system. In this subsection, I address this strong form of embodiment because this view provides a theory of how abstraction arises from sensory-motor experiences by way of metaphor.

In the strong view of embodied cognition, abstract entities like concrete ones use the same sensory-motor and affective systems to provide structure for mental representations. Metaphors are a necessary part of our conceptual system for they provide the mapping between the two domains like “affection” (an abstract human emotion) and “warmth” (a sensory experience). This mapping develops early and motivates such linguistic metaphors as “a warm reception”. For as Marks (1996) states “Even if some perceptual metaphors end up being mediated linguistically, their origins appear to be wholly in perception itself, starting within perceptual processes before being overlaid and dominated by linguistic ones” (p. 59).

Strong embodiment has been heavily influenced by the early work of Lakoff and Johnson (1999) and more recently by Gallese and Lakoff (2005). Labeled the “strong”

version for in this framework of embodied cognition, abstract concepts are even viewed as deriving from sensory motor experiences. Based partially on Merleau-Ponty's (1962) idea that the body works as our "general medium for having a world" and through the primary actions of perceiving and moving about in this world, the body provides the building blocks to move from concrete and literal meanings to more abstract and figurative meanings.

*The body is our general medium for having a world. Sometimes it is restricted to the actions necessary for the conservation of life, and accordingly it posits around us a biological world; at other times, elaborating upon these primary actions and moving from their literal to a figurative meaning, it manifests through them a core of new significance: this is true of motor habits [sic] such as dancing. (Merleau-Ponty, 1962, p. 146)*

Mandler (2004) and Lakoff and Johnson (1999) provide further insight into how this conceptual development may occur among children. First, they learn concrete language directly from experientially interacting with their bodies in the world and this then proceeds to more complex and abstract language. These "conceptual primitives" are combined, mapped, and blended in new ways to extend meaning into abstract domains. The idea that metaphors are embodied in our interactions with the world around us is heavily influenced by work done in the fields of image schemas and conceptual metaphor theory. I look more closely at both of these in the following two parts.

### Image Schemas: The Development of Experiential Structure

An image schema is an abstract representation that provides structure to our everyday experiences. It is dynamic and develops through our reoccurring perceptual and motor interactions with the world around us and supplies a certain amount of coherency to these experiences. Johnson (1987) argues that these "experiences" should "be understood in a

very rich, broad sense as including basic perceptual, motor-program, emotional, historical, social and linguistic dimensions” (p. xvi). Lakoff (1987), in turn, elaborates on this idea and provides some examples of them:

*Image schemas are relatively simple structures that constantly recur in our everyday bodily experience: CONTAINERS, PATHS, LINKS, FORCES, BALANCE, and in various orientations and relations: UP -DOWN, FRONT -BACK, PARTWHOLE, CENTER -PERIPHERY, etc. (p. 267)*

To illustrate how an image schema is thought to work, in this paragraph, I provide some examples of the BALANCE schema. Balance is something one learns through our bodies interacting within the environment and “not by grasping a set of rules” (Johnson, 1987, p. 74). We learn from a very early age bodily equilibrium and disequilibrium and the need to maintain equilibrium. This BALANCE image schema emerges from the earliest stages of human development and continues throughout life for it is a pervasive part of the body learning to negotiate with the environment. Some examples of this are a baby learning to stand or a child learning to ride a bicycle to other experiences such as traversing a ledge or trying to stay upright while wading in the ocean. So this image schema is the “point of axis around which forces and weights must be distributed so that they counteract or balance off one another” (Gibbs & Colston, 1995, p. 350). This kinesthetic experience of balance forms this image schema, which can then be extended to more abstract domains like economics and politics. For example the word balance itself may be used to talk about maintaining a sense of monetary equilibrium as in “to balance the books”, but it can also be used in linguistically creative ways. The following is a literal example of a person displaying a high level of balance by walking on a tight rope over Niagara Falls.

- (1) He's going to be walking over Niagara Falls on a tight rope  
(CNN Situation 2012.06.15).

Having background knowledge of a tight rope, which is a rope suspended between two edges where a person then proceeds to walk across while maintaining one's balance all the while mindful of the risk of losing balance and the foreseeable result of injury or even death, can be projected onto more abstract concepts like the precarious position of the US economy in 1990.

- (2) First of all, I hope these other fellows are right, however, I think the Federal Reserve really is walking a tight rope... (PBS Newshour 1990.08.15).

Here the Federal Reserve is personified as a person like in example (1) and physically crossing a tight rope, which is being in a high risk situation where maintaining one's balance is paramount. Losing balance would not cause physical injury, but rather economic turmoil. This image of balancing on a tight rope is multi modal, which means that it is not only in language, but can also appear in other modalities like the visual, as in pictorial metaphors (Forceville, 1996). The Economist magazine often exploits these metaphors in its cover art. On the February 8<sup>th</sup>, 2014 issue, a man on a unicycle holding an umbrella cycles across a tight rope suspended in the sky with the caption "the worldwide wobble". Again this pictorial metaphor is harnessing the image schema of BALANCE and the difficulty of maintaining balance while traversing an elevated and unstable ground. This can be extended to various other instances where it is difficult to maintain one's balance like crossing a tattered suspension bridge (The Economist, 2010-02-13). This concept of balance is conceptualized as being in a state of equilibrium where the weight is equally distributed resulting in a feeling of stability and composure. While

losing balance disrupts this equilibrium leading to instability and the lack of composure that can also be found in figurative expressions using such words as “slipped” or “tripped”. An external force can also push one over and cause one to lose balance, so in the following example, a passenger plane being shot down over Ukraine may provide the causal force of sending the region into a disequilibrium or a chaotic state of affairs.

- (3) PJ Crowley: Downed MH17 is tipping point in Ukraine (BBC.com, July 18 2014).

A tipping point again is being in the state of losing one’s balance and in turn falling over. These image schemas are highly important for language acquisition and providing structure to everyday experiences interacting in the world, as Mandler (1992) stated, “image-schemas provide a level of representation intermediate between perception and language that facilitates the process of language acquisition” (p. 587).

### Conceptual Metaphor Theory

Those working within a Conceptual Metaphor Theory (hereinafter CMT) framework argue that metaphor is essentially a matter of thought and only derivatively a matter of language and therefore metaphor is more than a rhetorical device, but an important part of thought, reason, emotion, and the imagination (Gibbs, 1994; Kövecses, 2006; Lakoff, 1987; Lakoff & Johnson, 1980; Lakoff & Johnson, 1999; Sweetser, 1990).

Lakoff (1988) argues that “meaningful conceptual structures arise from two sources: (1) from the structured nature of bodily and social experience and (2) from our innate capacity to imaginatively project from certain well-structured aspects of bodily and interactional experience to abstract conceptual structures” (p. 121) For instance, the

bodily experience of carrying a physical weight is projected onto the abstract psychological concept of being in a state or situation of difficulty. This often comes about due to such circumstances as being in financial trouble. Consider the following lines of how someone describes credit card debt:

- (4) But 6 months later, she says, he phoned and said it was over, leaving her with a \$3,600 apartment lease to pay off, medical bills and a heavy load of credit card debt (ABC 20/20 Nov. 21, 2008).

In the above example, debt is a “heavy load”, a weight that one carries around. Literally this obviously is not true since if debt had any physical form it would most likely be that of a single sheet of paper. This weight of debt can be so heavy (as in the more the debt the heavier the weight) that it can cause one to sink underneath it.

- (5) Last fall, Jennifer Gonzales, 26, felt as though she was sinking under the weight of her debt (Cosmopolitan 2002 Aug Vol. 233, Iss. 2; pg. 142).

This is also a very common visual metaphor that exploits such images as a ball and chain. Typically the images portray a human figurine carrying this weight, which presumably is significantly heavy for the person is slouched over. Yet weight is not simply used to talk about being in some precarious financial situation, it can also be used to talk about psychological difficulties, such as pressure, stress, or expectations. This weight similar to a pack is carried on one’s shoulders and physically weighing someone down, yet at the same time has the possibility of being removed.

- (6) Lin said during his introductory news conference with the Lakers on Thursday. "I think that's been a big weight off my shoulders and I think that's very important for me as a player" (ESPNLosAngeles.com July 24, 2014).

There is also the expression “emotional baggage”, which has become such a conventional expression that there are countless web sites and self-help material that provide advice to those who carry around this weight. Emotional baggage though is more than an idiomatic expression for the analogy can be imaginatively and intricately expanded where the accumulation of difficulties in life is like carrying around a heavy suitcase where the bag actually takes on certain physical properties as something that you can “drag around” and “haul” somewhere on a summer vacation.

- (7) The Kellehers of Massachusetts wouldn't begin to know how to pack lightly: They're dragging around too much emotional baggage. And every summer, they haul it up to Maine to their vacation home (Christian Science Monitor June 28, 2011).

More creatively these negative life experiences can in fact be pieces of clothing that you actually try to pack away into this bag and sometimes if there is too many pieces of clothing, this bag will actually burst open and scatter around the room.

- (8) It's the emotional baggage I'm hauling around that's causing all the trouble. Because every so often, the neatly packed suitcase, which is my old marriage, bursts open and the bad memories scatter like dirty laundry (Source unknown).

This emotional baggage can also be extended to have quantifiable characteristics, as in, actually weighing 50 lbs. and removing it from one's back will result in a feeling of freedom and lightness.

- (9) They have a sense of well-being, and a sense of relief, and a sense of charm because they've just had 50 pounds of emotional baggage taken off their shoulders (NPR Fresh Air 12:00 PM EST Oct. 12, 2010).

In contrast, the conventionalized idiomatic expression, “kick the bucket” is highly constrained. For example one cannot make it passive “the bucket was kicked by him” or creatively extend the situation by saying something like “he took the bucket up to his summer home and kicked it up there”. Such an idiomatic expression is frozen, highly opaque, and most likely arose from some currently unknown historical source and not motivated by a conceptual metaphor as in the case of “emotional baggage”. Lakoff and Johnson (1980) began to see that many metaphorical expressions are not simply arbitrary in nature, but are clusters that are structured and motivated by a conceptual metaphor, as in this case, DIFFICULTIES ARE BURDENS<sup>2</sup>. So this metaphor involves understanding difficulties in life whether financial or psychological through a semantically distinct domain, that of a burden, or in more common vernacular, a physical weight.

So in summary, image schemas develop through our perceptual and motor interactions with the world around us and provide us with some coherent structure to these experiences. While conceptual metaphors utilize these image schemas and project this more experiential domain of experience onto a more abstract domain. So image schemas, like BALANCE or BURDENS, provide a certain amount of structure to understanding abstract and complex concepts like economics and emotional or financial difficulties. These image schemas are embodied and therefore are not dependent on natural language, but arise through reoccurring interactions with the world. With its popularity, CMT has accordingly triggered a number of controversial claims against it and has garnered both strong critics and supporters.

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<sup>2</sup> In the field of cognitive linguistics, conceptual metaphors are all in caps to distinguish them from instantiations of linguistic metaphors. Moreover with a CMT framework, the first term (topic) is called the **Target Domain** and the second term (vehicle) is called the **Source Domain**.

## Conceptual Metaphor Theory: The Controversies & Criticisms

There is plenty of controversy and contention concerning CMT (Haser, 2005; McGlone, 2007; Murphy, 1996). It is beyond the scope of this thesis to go into detail about these varying arguments and objections, but one critical point made early on by Murphy (1996) is worth noting and his distinction between a weak and a strong version of CMT. In the weaker version, metaphors play an important role in influencing and organizing the construction of complex abstract concepts (target) by grounding them in concrete concepts (source), but are not essential in their conceptual representation. Thus the representation of abstract concepts is not necessarily metaphorical and if we extend this further, subsequently not grounded in the sensory-motor systems. Murphy (1996) also notes that these abstract concepts also need to have some semantic primitives, in a sense, it needs to have a certain amount of independent structure in order for the metaphorical mapping onto them to actually take place. Haser (2005) makes a similar claim in reference to Lakoff and Johnson's (1980) conceptual metaphor ARGUMENT IS WAR. In CMT, they assert that arguments are systematically correlated to our experiences of war, but Haser (2005) insists that there must be some "antecedent conception of what arguments are, otherwise the purported ability to experience 'correlations' between the two domains appears wholly mysterious" (p. 157).

Another criticism of CMT is from McGlone (2007), who views it as simply having "atmospheric influence" while not faring well "theoretically or empirically" (McGlone, 2007, p. 122). All three (Haser, 2005; McGlone, 2007; Murphy, 1996) also point out the circularity of conceptual metaphors and the overreliance on linguistic evidence "[. . .] the empirical base for the theory must be expanded beyond linguistic

phenomena ... there is a circularity here [...]" (Murphy, 1996, p. 200) and "[c]learly, the conceptual metaphor view must go beyond circular reasoning of this sort and seek evidence that is independent of the linguistic evidence" (McGlone, 2007, p. 95). Gibbs (1996; 2011) responds to many of the criticisms put forth by both McGlone and Murphy, most notably the criticism that there is little nonlinguistic evidence to support CMT.

### Conceptual Metaphor Theory: Supporting Evidence

Despite the criticisms of CMT for using circular reasoning and over-relying on language for substantiation, there has been a growing amount of nonlinguistic evidence to support CMT. For instance, Boroditsky (2000) and Boroditsky and Ramscar (2002) demonstrated how the abstract sense of time is grounded in the physical experience of movement through space. They asked two groups of participants after each group having been prompted to think about motion in different ways the following ambiguous question, "Next Wednesday's meeting has been moved forward two days. What day is the meeting now that it has been rescheduled?" This question is ambiguous for it can be interpreted in two different ways depending on how one metaphorically frames the question. One could involve an ego-moving metaphor where one metaphorically sees oneself as physically moving through space ("I'm approaching 50!") or on the other hand an object moving metaphor where one metaphorically sees time as an object moving towards oneself in space ("Another year is quickly approaching"). In the experiment, one group of participants were asked to imagine themselves moving towards an object, thus priming an ego-moving metaphor situation and the other group was asked to imagine an object moving towards them, thus priming an object-moving metaphor. Those in the first group

were more likely to answer “Friday” to the above question to which the researchers interpreted as the result of being primed to think about an ego-moving metaphor.

Özçalışkan (2007) also provides evidence for the embodied nature of conceptual metaphors through studying how young children learn motion metaphors. Children go through a transitional stage where children (around 4 years old) interpret “the metaphorical concept as a physical object and by physically performing the action conveyed in the metaphor (e.g., crawl on all fours when asked how time crawls). But at age 5, instead of physically performing the action, children start simulating the actions imaginatively and create partial reenactments of the action conveyed in the metaphor by producing hand gestures in spaces aligned with the target domain of the metaphor” (p. 165). This illustrates how metaphorical concepts are grounded in sensory-motor experiences and through scaffolding are projected from the physical into the abstract.

Boot and Pecher (2010) utilizing nonlinguistic materials in their experiments thus directly addressing McGlone and Murphy’s criticism of CMT, found that the conceptual metaphor SIMILARITY IS CLOSENESS employs an asymmetrical conceptual mapping from the more concrete domain “closeness” to the more abstract domain “similarity” and is “fundamental to the concept of similarity [and] automatic and not due to linguistic associations” (p. 952). Additionally, a substantial amount of work with conceptual metaphors in the field of experimental and social psychology (Landau, Meier, & Keefer, 2010; Landau, Robinson, & Meier, 2014) has flourished over the past decade providing some additional evidence of how conceptual metaphors play a role in social cognition and interpersonal behavior. One of the most commonly cited articles (Zhong &

Liljenquist, 2006) presents evidence that shows that when one feels a threat to one's own moral purity it activates a desire to physically cleanse oneself. This research provides some non-linguistic evidence to the conceptual metaphor, MORAL PURITY IS CLEANLINESS, which supports the metaphorical examples that can be found in language as in the following Facebook posting that someone posted after reading about a sexual abuse scandal at a school.

- (10) Horrible story ... gonna go wash my hands and disinfect my mouse (Facebook, 2014).

Here even the mouse is contaminated by the story since it is the tool used to scroll through the article. Other experimental psychological studies have also found similar results with other conceptual domains like physical coldness and social exclusion (as in the metaphorical expressions of a “cold shoulder” or a “cold stare”) (Zhong & Leonardelli, 2008) and warmth and friendliness (Williams & Bargh, 2008), anger and heat (Wilkowski et al., 2009), time and space (future-front/past-back) (Boroditsky, 2000; Weger & Pratt, 2008), power and spatial relationships (up/down) (Schubert, 2005), and harboring a secret and physical weight (Slepian, Masicampo, Toosi, & Ambady, 2012; Slepian, Masicampo, & Ambady, 2014). Despite the vast amount of nonlinguistic evidence supporting CMT (Landau et al., 2010), some researchers have claimed difficulties in regards to duplicating these findings (Earp, Everett, Madva, & Hamlin, 2014; LeBel & Wilbur, 2014). One factor that could have contributed to these less reliable findings is that the Earp and colleagues (2014) study used vicarious recollection of past ethical and unethical experiences and this exerts weaker moral effects than first person direct enactment (Barsalou, 2008; Lee & Schwarz, 2016).

### 2.2.3 SUMMARY OF AN EMBODIED VIEW OF METAPHOR

In this section, I have provided background on how metaphors emerge in language through physical instantiations of the body interacting in the social and cultural world. It is through this “embodied action” where cognition takes place. This provides a foundation in how to view metaphors arising in language. In summary:

- Historical views of metaphor often entailed viewing them as a “mark of genius”. In contrast, modern approaches view them as unremarkable insofar as they are commonplace in everyday language and mostly unconscious.
- Metaphors are conceptual. Thus they appear in natural language, but also in other modes and forms of communication like gestures, images, and music.
- Metaphors provide the conceptual structure to think of abstract concepts, which are inherently grounded in experiential concepts (movement, space, closure, weight, etc.).

Since metaphors are all pervasive in language, the second goal of this section is to consider how metaphors arise within individuals. In the following section I first look at how children develop metaphorical competence in a first language and then how this occurs in a second or foreign language.

### 2.3 THE DEVELOPMENT OF METAPHORIC COMPETENCE AT THE INDIVIDUAL LEVEL

Language typically develops in children during their first year of age. It emerges along with other important socio-cognitive skills like joint attention and intention-reading (Tomasello, 2003). Yet obviously the first words that a one-year old utters are not metaphors. Likewise a second language learner does not simply start producing novel

metaphors in a second language immediately in the first day of class. How children and second language learners develop the ability to interpret and produce metaphors is complex and messy, but in different ways. The following two sections investigate this question with the aim of comparing and contrasting how children and second language learners develop metaphorical competence in an L1 and an L2.

### 2.3.1 THE DEVELOPMENT OF METAPHORIC COMPETENCE IN A FIRST LANGUAGE

The question that I address in this section is “How do children develop the ability to freely and fluently use metaphors in their first language?” Gentner (1988) has argued that research into metaphorical competence is “fraught with contradictions” for children have been both described as having poor skills and being quite talented at using metaphors. Evaluating the empirical findings on the development of metaphorical competence in children is complicated and difficult and often involves both conflicting views of what a metaphor actually is and how to measure such ability in children. In this section I will look at different and competing views about the ontogeny of metaphor and attempt to synthesize the research with the aim of providing a foundation for understanding how metaphorical competence develops in an L1.

One position, rooted in the cognitive stages of development proposed by Piaget, views metaphor as emerging later somewhere during middle or late childhood after the child has acquired more complex cognitive and linguistics skills (Asch & Nerlove, 1960; Cometa & Eson, 1978; Inhelder & Piaget, 1958, 1964). Yet despite providing groundbreaking insight into the developmental processes of children acquiring metaphor,

this late onset claim began to be questioned, as more naturalistic approaches were developed to assess metaphor (Winner, 1995).

This alternative view proposes that metaphorical language appears early and can be found even in preschool children (Winner, 1997). In addition, metaphorical understanding began to be seen as a far more complex and messy developmental ability than previously imagined. For in fact metaphorical understanding may involve three different and widely divergent abilities: production, comprehension, and metalinguistic awareness (or the ability to explicate and interpret the rationale of the metaphor) (Winner, Rosenstiel, & Gardner, 1976). As previously stated, according to this position, in contrast to the late-onset view, metaphor production emerges early in development. This position also stresses the proclivity of children to play with language. In fact, while doing this, they spontaneously produce a substantial number of metaphors (Carlson & Anisfeld, 1969; Chukovsky, 1968; Gardner, Kircher, Winner, & Perkins, 1975). These playful metaphors are often quite different than how adults may use a metaphor such as calling an umbrella a “rain roof” (Marschark & Nall, 1985). Yet there are a number of linguistic and cognitive developmental changes necessary for a child to acquire an advanced ability to use, understand, and interpret metaphors such as:

- Understanding relational features between two distantly related semantic domains
- A greater depth of semantic knowledge

These points will be discussed in more detail in the following parts of this section.

### From Perceptual to Relational Metaphors: A Continuum Towards Complexity

Minimally for a child to have the capacity to understand or produce a metaphor, the child needs to be able to perceive similarities between the topic and vehicle concepts, as well as, being able to conceive one thing, as if it were the other (Winner, McCarthy, & Gardner, 1980). Young children have been shown to be able to perceive similar relationships between entities in differing semantic domains (Gentner, 1977). Winner et al. (1980) argue that the capacity to perceive similarity between concepts is really the heart of learning and is likely present at birth and continues to develop with age. For example in an early study, Carlson and Anisfeld (1969) cite a 2 year old child saying, “I’m a big waterfall” when sliding down the front of his father. They observed that this child also appeared to be aware of this semantic extension and deviation of meaning, as a possible example of an early form of verbal humor. This “deviation of meaning” is an important element in metaphorical development. For a metaphor intentionally violates a conceptual boundary and this conscious incongruence drives the metaphor. For instance, “Mary is a doctor” does not violate any conceptual boundary for a woman may belong to the category of a doctor, but an example like “Mary is a mouse” would, since obviously a woman does not fit into the category of a mouse. This deliberate bringing together of two sufficiently distant concepts, so that the domains appear to be incongruent, but at the same time share some similar properties, is a necessary condition for a metaphor (Kittay, 1987). Although these playful examples of language often used by children (e.g., “hair is spaghetti” see Billow, 1975) may appear on the surface to be a metaphor, but perhaps the child is simply overextending language due to a lack of vocabulary.

Adults also naturally use metaphors as a means to “fill the gap” in language and overextend the usage of words to include new and novel usages. Of course for adults the constraint is often due to a lack of vocabulary in the language, while for children the overextension may simply be the child’s own lack of vocabulary knowledge. The point though is the controversy on whether or not these overextensions of words are truly metaphorical or not. In order to better understand how children acquire the ability to use metaphor, it is necessary to first look at symbolic play.

An important aspect in the development of metaphorical competence in young children is the use of symbolic play. Knowles and Moon (2006) discuss how “very young children are capable of accessing imaginary worlds—they follow stories, and understand what it means to pretend and play”, to which they feel, “this ability to deal with the unreal is an early form of figurative competence” (p. 62-3). This early form of figurative language use (as young as 2 years old) is often viewed as the ability for these young children to perceive similarities between objects and not the result of “linguistic accident”, but a deliberate and spontaneous metaphor (Billow, 1981). So the earliest form of metaphorical ability in children is this nascent capability to understand and produce metaphors based on similarity features such as calling a ball a bomb because of their comparable shapes and at the same time, the child is fully aware of this similarity and the deviation (Billow, 1981; Vosniadou, 1987).

This first stage of metaphor development involves feature-based similarities (shape, size, color, etc.), as noted above, and this developmental process then proceeds to a second stage that involves greater complexity and includes analogical and metaphorical

cross-domain mappings, which relies more on relational structure (Gentner, 1988; Vosniadou, 1987; Winner et al., 1976). Young children have a keen propensity to understand feature-based similarities between objects, but understanding relational structural mapping improves with age. Gentner (1988) makes a distinction between attributional (mere appearance e.g. “a snake is like a hose”) and relational metaphors (“a tire is like a shoe”) and shows that adults have a preference for relational metaphors, as well as, judging them to be more apt and focusing more on their relational structure. In her study, she shows that children have a great propensity to produce and comprehend attributional metaphors, but relational metaphors increases steadily with age, to which she calls this a “relational shift in metaphorical development”. In another study, Nippold, Leonard, and Kail (1984) used nominal metaphors, which follow the traditional A is B format (“the bird was a rainbow flying in the sky” presumably meaning “the bird was colorful”) and proportional metaphors, which contain two topics and two vehicles using an analogical relationship (“the bird’s nest was a piggybank that had no coins” presumably meaning “the bird’s nest had no eggs”) to examine the comprehensibility of these two contrasting metaphor types for children. In their study, they showed that analogical metaphors are significantly more difficult for children to understand. In this same study, they also demonstrated that children improve performance on metaphor tasks with age (between 7 and 9 years old).

In short, children at a young age have a strong propensity to use metaphors that are often based on perceptual similarities between two objects. As the child develops, the child goes through a “relational shift” and can begin to go beyond mere appearances and perceptual attributes and proceed to see functional similarities. A shoe and a tire, though

perceptually do not look alike, share the functional relationship of things used to move across some location in space. Another important aspect of the development of metaphorical competence in children that coincides with this relational shift is the development of general semantic knowledge.

#### First Semantic Knowledge, Then Metaphor

Despite evidence that supports a relational shift in the development of metaphorical competence in children, it has also been found that domain knowledge may actually override this. For instance, a number of studies that controlled the domain knowledge showed that even young children could make relational connections between the topic (target) and vehicle (source). These can be abstract concepts, as well as, psychological ones (Broderick, 1991; Nippold, Leonard, & Kail, 1984; Waggoner & Palermo, 1989).

For a child to understand a metaphor, the child needs to have a certain level of linguistic skill, yet this is also obviously true for literal language. Moreover a child needs to have sufficient knowledge of the topic or that which is being talked about in the metaphor. Keil (1986) proposed the importance of increasing knowledge in a conceptual domain for the development of metaphorical understanding and especially in regards to the child's knowledge of the topic domain (Vosniadou, 1987). Waggoner and Palermo (1989) suggest "the development of metaphor comprehension rests heavily on the child's acquiring the knowledge that will make it possible to relate the tenor (*topic*) and vehicle in any particular metaphor" (p. 160 *italics are mine*). It is obviously difficult to produce and especially interpret relational structure of a metaphor without sufficient domain knowledge of the topic and vehicle. While attributional metaphors or those based on

perceived similarity do not rely as much on domain specific knowledge, but more perceptual recognition.

### Synthesizing the Contradictions in the Literature

The contradictions found in the literature on the development of metaphor in children are not as contradictory as they may seem, but vary due to a number of reasons:

- The type and difficulty of the metaphorical task (attributional, predicative, cross domain mapping, analogical, etc.)
- The required response (verbal, pictorial, multiple choice/understanding, production, explication, etc.)
- The required domain specific knowledge in order to perform the task

Metaphorical competence appears to proceed along a continuum from simpler feature-based similarities to relational structure mappings. Likewise children first produce metaphors, then understand them, and finally they can explicate the structure and meaning behind them. The following figure diagrams this continuum and explains each stage.

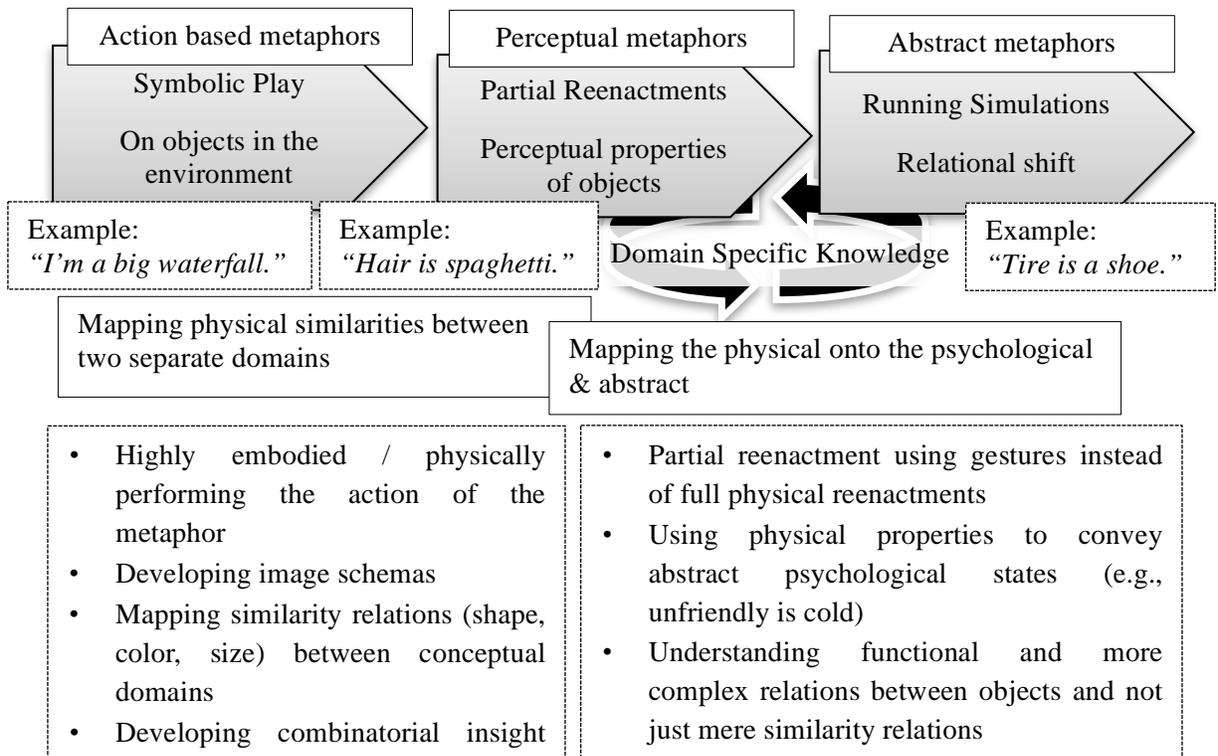


Figure 2.1: The continuum towards metaphoric competence in children

It should be noted here that while children may develop through these stages in a generalizable way, individual differences do exist. These differences may involve the propensity to produce metaphors (especially novel ones), the elaboration and detail in interpreting a metaphor, and aesthetic evaluation of metaphors. In this thesis since all the subjects are adults, they will have all achieved a certain level of metaphorical competence in their L1. Yet individuals will differ in this competence and I am interested in seeing if these differences then are also projected onto a second language. In order to do this, I also need to consider metaphorical competence in a foreign language and various constraints that foreign language learners may encounter when developing this ability.

### 2.3.2 THE DEVELOPMENT OF METAPHORIC COMPETENCE IN A FOREIGN LANGUAGE

The setting of this research study was in Japan where English is viewed as a foreign language. Accordingly, I will use the term *foreign language* here and not *second language*. Foreign language learning usually implies that the foreign language is taught within the walls of a classroom and students have minimal exposure to it outside in the so-called “real world”. Despite the spread of English, as a *lingua franca*, it is still considerably foreign within rural northern Japan, where this research took place, and one will unlikely come across English in everyday life.

Acquiring metaphorical competence in a foreign language is a challenging and slow process, accompanied by misunderstandings (Littlemore, 2001b). Typically when learning a foreign language, the individual learns the forms of this new language, but has little opportunity to acquire the conceptual structures associated with these forms, which as a result, these learners may sound “un-natural” or “non-native like” (Kecskes & Papp, 2000). This is comparable to what Danesi (1992, 1995) has argued about, as he insists on the need to develop learners’ “conceptual fluency”. He argues that foreign language learners’ lack of metaphorical competence causes them to sound overly literal and despite years of study fail to ever achieve native-like fluency.

#### Developing Metaphorical Competence in an L2

To become metaphorically competent in a foreign language, one needs to understand how that language encodes its concepts, as well as being exposed to the conventional linguistic metaphors that are instantiations of that conceptual structure. For example, it has been shown that Malay-speaking learners of English found figurative language in the

L2 to be easiest when the expressions had an equivalent linguistic form and conceptual structure in their L1 (Chartelis-Black, 2002). Other research has also found similar findings (Deignan, Gabrys, & Solska, 1997), which indicate that similarity of conceptual structure and linguistic form facilitates the processing and comprehension of the figurative language among foreign language learners.

Yet there are a number of variables that arise when considering multi-word figurative expressions between two different languages. For instance, the two languages could share the same linguistic form (i.e., “to pull someone’s legs” appears both in English and Japanese<sup>3</sup>), but have different figurative meanings. Azuma (2012) has shown this to be one of the riskiest types of metaphorical language, namely due to the first language imposing its meaning onto the expression in the second language, which happens to share equivalent linguistic form. In order to demonstrate the range of possible linguistic and conceptual overlap between languages, Tables 2.1-2.4 provide a number of examples with Japanese and English figurative use of HAND (“手” te). In situations when these two languages both share an equivalent linguistic form and conceptual structure (as in Table 2.1), one could conjecture that this would not cause much difficulty in learning. In contrast, Tables 2.2 – 2.4 demonstrate numerous other ways that languages may appear similar and different in the use of figurative expressions based on linguistic form and conceptual structure.

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<sup>3</sup> In Japanese, it means to hold someone back or get in the way of someone. This likely refers to the physical state of actually pulling someone’s leg and preventing that person from advancing in some endeavor.

TABLE 2.1: EQUIVALENT LINGUISTIC FORM AND CONCEPTUAL STRUCTURE USING HAND

Japanese	Literal Translation	English	Conceptual Basis
手を貸してくれ (te wo kashitekure)	Hand lend give	Lend me a hand	HAND IS WORK

TABLE 2.2: DIFFERENT LINGUISTIC FORM BUT EQUIVALENT CONCEPTUAL STRUCTURE USING HAND

Japanese	Literal Translation	English	Conceptual Basis
手が足りない (te ga taranai)	Hand enough-not	Short-handed	HAND IS WORK
手に負えない (te ni oenai)	Hand deal with-not	Out of hand; uncontrollable	HAND IS ABILITY TO CONTROL

TABLE 2.3: EQUIVALENT CONCEPTUAL STRUCTURE – NO LINGUISTIC EQUIVALENT IN ENGLISH USING HAND

Japanese	Literal Translation	English	Conceptual Basis
手を加える (te o kuwaeru)	Hand add	Add something	HAND IS WORK

TABLE 2.4: DIFFERENT CONCEPTUAL STRUCTURE – NO LINGUISTIC EQUIVALENT IN ENGLISH USING HAND

Japanese	Literal Translation	English	Conceptual Basis
手を切る (te wo kiru)	Hand cut	Break off a relationship	HAND IS RELATIONSHIP
手を組む (te wo kumu)	Hand link, lock	Cooperate with	
手がない (te ga nai)	Hand exists-not	No other way	HAND IS WAY, METHOD

Of course this example is an exceptional case where a single linguistic element, (“手” te) HAND, has an extensive array of conceptual structures and linguistic forms and some of these in Japanese overlap with the English and yet a number of them fail to overlap. The point here is that to acquire metaphoric competence in a foreign language requires extensive exposure to the language and understanding of these differences. For instance, if an English speaker applies an L1 conceptual structure (HAND IS WORK) to a new and unknown figurative expression in Japanese (L2) like (“手がない” te ga nai),

this could obviously lead to confusion and misinterpreting the meaning of the expression (\* no workers) instead of the correct meaning (no other way).

Although it is important to note here that becoming more aware of the underlying conceptual structures across different languages does not necessarily result in one being able to freely use the linguistic instantiations related to these conceptual structures (Chartelis-Black, 2000). For it is not always clear and can be rather arbitrary and unpredictable just how information from the conceptual structure ends up taking one specific linguistic code and not another (Deignan et al., 1997, p. 354; Holme, 2004, p. 97). Moreover, a number of figurative expressions also utilize language that has strong cultural traits or nuances and without this cultural knowledge interpretation is fraught with problems and guesswork (Azuma, 2012).

Since metaphor and figurative language more generally is an important part of language, broadening its instruction in the FL classroom has the potential to enhance learners' communicative proficiency (Johnson, 1996). Consequently, foreign language educators began to explore ways to integrate metaphor into the classroom in greater depth in the 1980s and 1990s (Low, 1988). In the next subsection, I elaborate on some of these approaches to teaching metaphor in the classroom.

#### A Teaching Framework for Metaphors: A Focus on Conventionality

Early methods used for teaching metaphor to foreign language learners often relied on memorizing long lists of phrases, which some happened to be metaphorical, or using a “polysemy method” that explored the multiple ways a single item like the word “foot”

could be extended in meaning (Low, 1988). More recently, research on teaching figurative language in a foreign language classroom revolves around the teaching of two main linguistic forms: phrasal verbs (Lindstromberg, 1996; Rudzka-Ostyn, 2003; Yasuda, 2010) and idioms (Boers & Demecheleer, 2001; Cooper, 1999; Deignan et al., 1997; Irujo, 1986; Lazar, 2003).

Low (1988) suggested one possible way to improve teaching materials is to include analytical discussions that could provide insight into the underlying structure and internal consistency of metaphors. Using such an explanatory framework to discuss with learners the underlying patterns connecting metaphorical expressions together became more and more widely used in foreign language classrooms. This seems to be especially prevalent in English for Specific Purposes, particularly in regards to economics (Chartelis-Black, 2000; Henderson, 2000; White, 2003). Others have looked to improve foreign language learners' fluency with metaphors by enhancing their awareness of the conceptual structure motivating the metaphor (Boers, 2000a, 2000b; Deignan, Gabrys, & Solska, 1997). This awareness raising technique aims to improve learners' metalinguistic and reflective skills by having them think more deeply about the language and the organizational structure that binds certain expressions together. This is what Jakobson (1956) referred to as "speaking of language" for the learner overtly considers the nature of the linguistic code. Boers (2000b) suggests that awareness raising techniques that organize vocabulary along metaphorical themes may facilitate the retention of unfamiliar figurative expressions for foreign language learners. It has also been suggested to use etymological elaboration, especially for transparent idioms, as an awareness raising technique, whereby the student and teacher retrace the source in order to figure out the

metaphorical meaning of the expression (Boers, Demecheleer, & Eychmans, 2004). Recognizing the importance of metaphor in foreign language learning and overall communicative competence has even influenced the direction of English language textbooks (Lazar, 2003).

In short, the goals of the teaching methods outlined above are to expand students' multiword lexical knowledge, provide organizational structure to figurative linguistic expressions, and mark possible differences between the conceptual structure between the L1 and L2. It should be noted that the figurative expressions typically taught in a classroom are conventional, idiomatic, and standard and seldom are exploratory or those that seek out new and unknown possible combinatory patterns between two concepts. On the other hand, as previously mentioned in the earlier section, children develop metaphorical competence in an L1 through symbolic play and using highly playful language, L2 learners often depend on explicit instruction and memorizing conventional forms of language.

Despite the importance of play in language learning and more generally in every day language use, not only for children but also for adults (Cook, 2000; Lantolf, 1997; Tarone, 2000), foreign language instruction has just begun to examine the importance and pedagogical value of language play in the classroom (Cekaite & Aronsson, 2005; Waring, 2013). On the semantic level, playfulness with language often involves combining units of meaning in a manner that creates a new way of seeing the world (Cook, 1997, p. 228), which is really the basis of creative metaphors. One may assume that the lack of exposure and opportunity to playfully use language may inhibit foreign language learners from

attempting to produce their own creative metaphors in the L2. This may be true, but in this thesis, the participants were encouraged to be creative and not to worry about being “right” or “wrong”, which is a factor when dealing with conventional and idiomatic examples of metaphorical language where prior knowledge of the linguistic code is paramount. In contrast, producing creative metaphors relies less on one’s linguistic ability with the target language and more on a general cognitive ability of combining distantly related concepts together in novel and meaningful ways.

### 2.3.3 CREATIVE METAPHORIC COMPETENCE: A POSSIBLE COGNITIVE PROCESS

One of the goals of this thesis is to examine whether or not *creative metaphoric competence* appears in both an L1 to an L2. If it appears in both languages, one could interpret this as suggesting the possibility that *creative metaphoric competence* is an individual difference and taps a cognitive process that is considerably different than the linguistic process to produce conventional metaphors, which relies heavily on memory retrieval of formulaic language. The cognitive processes whereby novel ideas emerge is a key part of understanding creativity (Ward, 2001) and creative metaphors offer a glimpse into such a process. Ward, Smith, and Vaid (1997) discuss the mental processes most relevant to creativity and give credence to three overlapping processes: conceptual combination, metaphor, and analogy.

Conceptual combination is blending together or synthesizing two or more concepts in order to create a new idea, whereby in this combinatorial process a new conceptual structure emerges. Like metaphors, some are deemed as highly conventional like the combination of “soccer” and “mom” to create “soccer mom”. In contrast, others

may seem less familiar and novel like “idea salesman”, which then may require a process of mental synthesis and analogical transfer to comprehend (Finke, Ward, & Smith, 1992, p. 98). Creative metaphors are a form of conceptual combination and as described in more detail in the next chapter, they can also be modeled as extensive structural mappings between two domains much like an analogy (Gentner, Bowdle, Wolff, & Boronat, 2001). Analogy is to think about relational patterns and is at the heart of human cognition, as well as being, the basis of “creative mental leaps” (Holyoak & Thagard, 1995). Similarly “metaphor uses many of the same mental processes as analogical thinking” (Holyoak et al., 1995, p. 220).

Traditional examples of metaphor often follow the “X is Y” format (e.g., The surgeon is a butcher); yet such examples of metaphor have fallen out of fashion recently for being “inauthentic” and lacking verifiable use in a corpus. Yet as I have been pointing out throughout this chapter, my aim is not to look at authentic examples of metaphor in everyday language, but instead examine how individuals attempt to produce creative metaphors when prompted in an experimental setting. Nominal metaphors often fall under the label of a *species to species* example of a metaphor whereby the two distinct elements may on the surface appear dissimilar, but are in fact connected by belonging to the same *genus*, as described by Aristotle in the *Poetics* (1961). A nominal metaphor is when one noun gets substituted for another noun such as the following example:

- (11) Language is still the most important weapon in the class struggle in England (San Francisco Chronicle, 1991).

So the noun, *weapon*, is used to refer to another noun that is semantically distant from it, in this case, *language*. The difficulty though is clearly and succinctly stating how these

two species may be part of a larger genus. Are they species of the genus of things that are strong and powerful or things that are used to defend oneself in times of conflict? The above example can also work as an analogy ( $a : b :: c : d$ ) for as a language is to a speaker of it, so to a weapons is to a soldier. Those people who continue to speak the local language are in fact soldiers struggling in this class warfare in England. So the aptness of the metaphor is being able to discover this genus connecting the two and then exploring relations that could be transferred from the source onto the target. To sum up, beyond the constraints of linguistic knowledge, generating and interpreting creative metaphors in an L1 or L2 requires a certain cognitive ability that utilizes both combinatorial reasoning and analogical thought.

#### 2.4 SUMMARY OF CHAPTER 2

In summary, I have shown that metaphor first develops in language through our embodied experiences interacting with the world around us. These sensory-motor and emotional interactions provide mental structure that then can be extended into abstract realms of experience. This embodied foundation of language is not unique to only the first language, but also has been found to be active in a second language (Dudschig, de la Vega, & Kaup, 2014). In addition, I have described the learning path of children, as they acquire metaphoric competence in an L1. This path to proficiency is dependent on domain specific knowledge. Moreover, children, generally speaking, use metaphors that share feature based similarities at first and then proceed through a “relational shift” whereby they increasingly use relational metaphors. Finally I have discussed metaphoric competence in an L2 and how research in this field involves teaching metaphorical

language to the L2 learners, which mostly entails conventional idiomatic and multiword expressions. In contrast, research in this thesis was less concerned with L2 learners' knowledge of such linguistic codes and more so with their ability to creatively come up with new and unfamiliar metaphors. It has been put forth in this chapter that this process involves combinatorial reasoning whereby concepts are combined in novel ways and analogical reasoning whereby relational patterns are explored between the two concepts.

Much of the recent work with metaphor favors conventional metaphors or those found in corpora. This is especially true in the field of second language studies, which have predominantly looked at ways to teach metaphoric language by enhancing learners' awareness of the conceptual structure motivating them (e.g., Boers, 2000b) or to look at metaphor and its relation to lexical competence in the L2 (Azuma, 2004). The main focus of these approaches is to better understand the developmental processes of learners' metaphoric competence in the L2 and various factors that may influence this from vocabulary knowledge to metacognitive strategies. In contrast, this study approached this topic quite differently by trying to minimize one's linguistic and conventional knowledge of metaphoric structure and focus narrowly on the novel and creative use of metaphors, which is the true power of them (Macarthur, 2014).

To conclude this chapter, as previously indicated, research has shown that the processing of metaphor does not necessarily take more effort or time than processing literal language. Instead, differences in processing of language may be more related to the matter of salience of the language (or what is most on one's mind) and this could be either a literal or metaphoric rendering of the language (Giora, 2003). However, this

research aimed to address what Giora (2003) calls the “other side` of salience – the issue of novelty and creativity” (p. 176). In this chapter, I have provided a review of the literature on some early approaches to metaphor and then introduced a contemporary view of metaphor and finally described the process of metaphoric development at the individual level in both an L1 and L2. In the next chapter, using three contemporary approaches to metaphor, I aim to show how metaphor needs to be viewed as being pluralistic. This allows me then to develop a theoretical foundation to discuss and measure *creative metaphoric competence* at the individual level.

## **Chapter 3 Differentiating Creative from Conventional Metaphors**

### 3.1 INTRODUCTION

In Chapter 2, I discussed how metaphors emerge in language and the development of metaphoric competence in an L1 and L2. Metaphors are an important and ubiquitous part of language (Paprotté & Dirven, 1985) and as mentioned in the previous chapter, this growing awareness of the importance of metaphor has resulted in a considerable amount of research that addresses metaphor from a cognitive linguistic and foreign language learning perspective (Holme, 2004; Littlemore, 2009; Robinson & Ellis, 2008). Research addressing this issue of metaphor in language learning ranges from pointing out the importance of them for overall competency with the language (Littlemore & Low, 2006a) to assessing various methods of bringing them into the classroom (Boers, 2000b; Deignan, Gabrys, & Solska, 1997). Despite this rising interest in metaphors in foreign language learning, there is a scarce amount of research that looks at metaphoric competence between a first and second language (see Littlemore, 2010). One of the aims of this thesis is to look specifically at this and examine whether or not individuals produce creative metaphors in both an L1 and an L2.

In this thesis, I have been using the term, *creative metaphoric competence*, which is the ability to bring two concepts from distantly related domains of knowledge together in a new and novel way, while at the same time establishing meaningful relationships between them. It is hypothesized in this thesis that *creative metaphoric competence* is an ordinary cognitive skill that everyone has though varying in degree and should show up

in both languages. In order to investigate this cognitive ability between languages, first it is critical to clearly distinguish between creative and conventional metaphors. Creative metaphors, though obviously not as common as conventional metaphors, still play a prominent role in language, as Glucksberg (1989) estimates that people use 1.8 novel and 4.1 frozen figurative expressions per minute of discourse. Pollio and colleagues (1977) estimate that “most English speakers utter about 10 million novel metaphors per lifetime ... this works out to about 3,000 novel metaphors per week” (p. 140). Creative metaphors often involve the feature of surprise and the unfamiliar, as compared to frozen metaphors, which are sometimes labeled “dead” and “inactive” metaphors and can lexically be regarded as homonyms or polysemes (Goatly, 2011) for the metaphorical meaning may even be more salient than the literal meaning.

In this chapter, I show that conventional metaphors are processed much like literal language and reflect the depth and breadth of vocabulary knowledge the individual has rather than the cognitive ability of *creative metaphoric competence*. Conventional metaphors are processed automatically and likely are stored in the mental lexicon. On the other hand, creative metaphors are processed differently than conventional ones, take more time to process, and involve combinatorial processes that recruit greater amount of bilateral neural activity in the brain. Though *creative metaphoric competence* is a natural ability that all humans share, as Gentner and Wolff (1997) succinctly say, “people readily link unlike ideas” (p. 331), yet like many other cognitive skills, people will differ in their inclination and ability to explore new combinatorial relationships among these “unlike ideas”.

There are three main sections in this chapter. In the first section, I discuss three contemporary views of metaphor: Conceptual Metaphor Theory (CMT), Graded Salience Hypothesis (GSH), and the Career of Metaphor Hypothesis (CofM). These provide a theoretical foundation to distinguish creative and conventional metaphors. Then, in the second section, I review the literature on creative metaphors and the brain and the recent interest in exploring what neuroanatomical regions are active during metaphor tasks. This provides further support to the necessity of differentiating metaphors based on their conventionality. Finally in the third section, I construct a framework that distinguishes creative and conventional metaphors as a guide for the research that follows in this thesis and examine ways to measure and assess *creative metaphoric competence* as an individual difference.

### 3.2 DIFFERENTIATING CREATIVE FROM CONVENTIONAL METAPHORS: THREE CONTEMPORARY VIEWS

The distinction between creativity and anomaly can be tenuous for the two are often closely linked together. Noam Chomsky astutely crafted the following sentence (12) to show that language knowledge is not bound by statistical properties, but rather through deductive reasoning and innate knowledge (Crain & Thornton, 1998). His goal was to show that sentence structure could be studied independently of meaning and thus favoring the more abstract pure laws of syntax.

(12) Colorless green ideas sleep furiously (Chomsky, 1953).

This sentence has become one of the most quoted lines by Chomsky, probably not for the reasons he wrote it, but due to the numerous attempts to provide meaning to it. Why

would such an intuitively anomalous sentence (at least to Chomsky) incite so much interest? Niemeier (1998) showed, while investigating the metonymic extension of color terms, that the above sentence is not semantically empty, as Chomsky presumed, but instead it exposes a part of our everyday conceptual strategies. It is precisely these conceptual strategies that enable one to extend “green ideas” to “young, fresh and not well-developed ideas” (Niemeier, 1998). Metaphors (or figurative language in general) often provide the creative extension to make sense of an anomaly. For instance, Pollio and Burns (1977) in a study that specifically asked subjects to interpret mechanically generated anomalous sentences, similar to the one written by Chomsky, found 82% of their subjects actually provided an acceptable interpretation and 60% of them did so by way of metaphor. This suggests that speakers of a language potentially can interpret any grammatically well-constructed sentence despite it being intuitively anomalous at first and this may be based on individual differences and their ability to creatively play with metaphors. This combinatory ability of connecting two seemingly unconnected semantic domains together is what I. A. Richards considers the power of the mind in the *Philosophy of Rhetoric* for “[t]he mind is a connecting organ, it works only by connecting and it can connect any two things in an indefinitely large number of different ways” (Richards, 1936, p. 125).

Aristotle indicated that to “make good metaphors implies an eye for resemblances” (*Poetics* 22: 1458b; cited in Mahon, 1999, p. 72). I assume here what he meant by “good metaphors” are ones that are creative and aesthetically pleasing. Though I would not go so far as to say that it is a “mark of genius”, as Aristotle did, but rather view it as a uniquely human combinatorial ability, which is key to intelligence and

creating new systems of knowledge (Spelke, 2003). Yet having this “eye for resemblances” assumes that there are individual differences that influence one’s ability to produce and interpret creative metaphors. In order to disentangle the more conventional entrenched metaphors that are part of our everyday common language and these creative metaphors, I address three contemporary views of metaphor in the following subsections. The goal is to find some distinguishing features that allow me to propose that not all metaphors are the same and cannot be clumped together into one “homogenous category” of figurative language. Instead metaphors lie along a continuum from the more conventional ones that are likely stored in the mental lexicon to novel metaphors (Pynte, Besson, Robichon, & Poli, 1996).

### 3.2.1 CONCEPTUAL METAPHOR THEORY

According to Conceptual Metaphor Theory (CMT) as introduced in Chapter 2, metaphor is more than a rhetorical device, but an important part of thought, reason, emotion, and the imagination (Gibbs, 1994; Kövecses, 2006; Lakoff, 1987; Lakoff & Johnson, 1980; Sweetser, 1990). CMT holds to the premise that “our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphorical in nature” (Lakoff & Johnson, 1980, p. 3). Underlying and motivating much of our everyday expressions are a wide array of conceptual metaphors such as the one elaborated on in Chapter 2 (i.e., BURDENS ARE WEIGHT). This metaphor provides a certain amount of conceptual structure to our understanding of financial debt, which feels like carrying a heavy load and the “weight” of this debt has a “crushing” heaviness that can impede movement forward. Linguistic metaphors then provide the data for these conceptual metaphors as in the example below:

- (13) Wall Street's bulls ignored the crushing weight of debt on the economy and the signs of a protracted recession (TIME 1992/01/13).

So in these examples, the source domain, a physical weight, gets projected onto the target domain, a burden or difficulty, and thereby causing one to conceptualize difficulties in terms of being weighed down by some heavy object. This difficulty does not necessarily have to be a financial difficulty, but can include psychological states as in the conventional idiomatic expression, “emotional baggage”. These examples are all rather conventional expressions found in everyday language and to most people probably do not represent a creative metaphor. Much of the research in CMT deals with metaphors that are so entrenched in the conceptual structure of the mind that they are unconscious, automatic, and not very poignant for research on creativity. Again my aim in this study is to reduce the focus on language and increase the focus on the combinatorial process of *creative metaphoric competence*. Lakoff and Johnson (1980, p. 53) do provide some insight into how imaginative or creative metaphors may surface in language:

- Instances where a conventional metaphor is extended in a new way
- Instances of unused parts of a conventional metaphor
- Instances of a novel metaphor that creates a new conceptual system

In a later book, Lakoff and Turner (1989), further elaborate on how one may develop creative metaphors (poetic metaphors to use their term) by going beyond the ordinary or conventional use of everyday language. Again this would require one of the following:

- Extending the boundaries of these conventional metaphors to include elements that are not already mapped
- Elaborating on them by imaginatively using unused parts of the metaphor
- Combining metaphors in new and unexpected ways

All of these instances are more or less reiterations of what they had previously stated. In this latter case, they use the word “poetic thought” and “poetic metaphor”, which might cause confusion and lead some to think that these creative metaphorical ways to extend ordinary language are exclusively for poets and not used in everyday conversations.

Carter (1999, 2004) who has worked extensively with CANCODE corpus investigating linguistic play and creativity in everyday language remarks that much of verbal play in everyday spoken discourse reflects literary properties and some of the most common ones are: speakers displacing fixed expressions like idioms and formulaic phrases and metaphorical extensions (1999, p. 211).

According to CMT, there are two primary ways to create novel metaphors. The first is by way of elaborating or extending an already existing conceptual metaphor. This can be done by using elements of the vehicle in new and unexpected ways or using unused elements of the vehicle. The following are instances of elaborations and extensions of the conceptual metaphor, THEORIES ARE BUILDINGS:

- (14) “These facts are the bricks and mortar of my theory.”
- (15) “His theory has thousands of little rooms and long, winding corridors” (Lakoff & Turner, 1980, p. 53).

Secondly one can create an entirely new conceptual mapping between a topic and a new vehicle that has not yet been commonly established. This is deemed as being very powerful for “[n]ew metaphors have the power to create a new reality” (Lakoff & Johnson, 1980, p. 145). This happens when a new metaphor enters into the fabric of our conceptual system and allows us to see something in a new and different way. Take for instance the conceptual metaphor THE MIND IS A COMPUTER (MACHINE). Obviously this metaphor is no longer novel, but it was not that long ago for this metaphor did not exist until machines and computers came into existence and we started to interact with them in our daily lives. Gigerenzer and Goldstein (1996) trace this metaphorical development calling it a “tools-to-theories heuristic” where the development of new tools (computers) leads to the discovery of new theories (as in theories of the mind). They refer to the work of Newell and Simon (1972) and their information-processing model of the mind, though taking some time to be accepted, has had a large impact in the cognitive psychological literature as terms such as “encoding, storage, retrieval, executive processes, algorithms, and computational cost” (Gigerenzer & Goldstein, 1996, p. 138) are frequently used to speak about cognition nowadays.

This metaphor can be further elaborated on by way of analogy. The mind is to the brain as computer software is to the hardware of the computer (Block, 1995). This metaphor has now infiltrated so deeply into our conceptual system and provides insight into how we understand the mind that it is difficult to think of the mind without thinking of it as a computational device. This metaphor is constantly being extended and elaborated on in new and creative ways, as culture can in turn be seen as the “software of the mind” (Hofstede, Hofstede, & Minkov, 2010) for it provides individuals within

society a *program* of how to behave and interact. Yet not all might agree with this metaphor and in contrast develop a new one that views culture quite differently such as culture being “networks of knowledge” (Hong, 2009). Here culture links people together just as computer networks link people together. Though both can be viewed as creative in their own way, they both are imaginative elaborations or extensions of the same metaphor.

### Digging Deeper into Creative Metaphors

How does one go about interpreting a creative metaphor? Interpreting a creative metaphor obviously requires different cognitive and linguistic abilities than simply judging a novel metaphor as meaningful or not. In addition, the aptness of the creative metaphor and the type of metaphor it is may influence the amount of relational complexity that can be explicated from it. In the example, “the river is a snake”, though meaningful, it does not provide much in terms of inferential structure between the two concepts, but rather is meaningful simply based on appearance similarity. In contrast, below is an example of a creative metaphor. It follows the typical “X is Y” format and allows for the development of a complex structure between the two domains.

(16) The therapy was an archeological dig (Cardillo et al., 2012).

First these disparate concepts, an archeological dig and therapy, are semantically distant, yet meaningful. For example, therapy deals with the mind and the psychological condition of an individual, so a highly abstract concept. It includes a patient to therapist relationship that entails the act of communication and the patient reflecting on one’s past in order to better understand one’s current situation. While an archeological dig deals

with the physical excavation of earth in order to discover some artifacts or other physical remnants. It includes an archeologist to ancient culture relationship that entails the act of uncovering and digging in the hope of finding some relics that may help modern culture better understand this historical culture. So the metaphor projects from a more physically experiential domain to that of a more abstract domain.

According to CMT, this would be an example of a poetic metaphor that uses previously unused parts of a conceptual metaphor. For instance, the conceptual metaphor, KNOWING IS SEEING, is prominent in this example, as well as, THE PAST IS BEHIND/BURIED and correspondingly to reflect on the past or recall a memory, which is a common activity in therapy involves going *back* in time or to *dig up* some past event. The predicate metaphor “dig” that metaphorically means “to look into the past” would on most accounts be considered a conventional metaphor.

- (17) 30-minute lifestyle therapy sessions. Michaels asked each woman to dig deep for answers (Prevention Nov 2011, Cohen, Bari Nan).

An “archeological dig” involves a type of digging that actually is trying to uncover buried historical artifacts and, so in short, is a creative use of an unused part of a conceptual metaphor and is not creating a “new reality” of how to view therapy, but expanding on a conceptual framework that we already possess. Moreover the correspondences between these two semantic domains are rich and provide a number of mappings (see Table 3.1).

TABLE 3.1: MAPPING FOR “THERAPY IS AN ARCHEOLOGICAL DIG” (BIRDSELL, 2017)

Source: Archeological Dig	Mappings	Target: Therapy
Archeologist	→	Therapist
Archeological Site	→	Therapist’s office
Ancient Culture	→	Patient
Object: Ancient relics	→	Past Memories
Means: Dig, unearth	→	Communicate
Goal: Discover more about this ancient culture	→	Goal: Discover more about the individual

The interesting thing about this metaphor is, what does the patient in the therapy domain map onto in the archeological domain? Logically it would seem that the patient should map onto another individual such as the archeologist’s apprentice or a student, but this would not make sense in the metaphor. Rather illogically what makes more sense is that the patient in fact maps onto the concept of “culture”. The mind of the patient in one’s current state is a modern culture. Each individual has a rich, unique, and historical past similar to past cultures. Inside the mind are memories and likewise inside the earth are remnants of a historical past. These remnants are shards, broken fragments of earthenware, and in contrast, memories are also fragmentary. The therapist provides assistance by helping the patient recall these memories about one’s past and then discuss them and provide some insight into his/her life with the goal of self-discovery. Likewise the archeologist digs for ancient relics that may provide some insight into that ancient culture with the goal of discovery. It is these types of creative metaphors that are open enough to interpretation, while at the same time rely on established conceptual structure that guide in this interpretive task.

## Summary of Conceptual Metaphor Theory

CMT provides important insight into creative metaphors and how often they are imaginative elaborations on more familiar conceptual metaphors. Some might cause a restructuring of our conceptual system, but more frequently are linguistic extensions that help us see something in a new and unexpected way. Despite the surprise that creative metaphors have, at the same time, they appear to make sense for the relations between the two domains fit. In the next section, I will look at a theory that describes metaphors existing along a continuum from novel to highly conventional. In this theory metaphors are viewed as having a career and as they become more familiar to the language community, this in turn, influences the way they are processed.

### 3.2.2 THE CAREER OF METAPHOR THEORY

In the Career of Metaphor Theory (henceforth CofM), Bowdle and Gentner (1999, 2005) argue that metaphors are “pluralistic” and clearly differentiate between the processing of novel and conventional metaphors. They consider metaphors “as a species of analogy” (2005, pp. 196, 198, 208) that progress through a conventionalization process. First novel metaphors are understood as figurative comparisons, though differing from the traditional comparison models that rely on a simple feature mapping process. Then as this aligned system between the two semantic domains becomes more strongly activated, a common metaphoric category for the target and base concepts is established. CofM is considered a hybrid model for it seeks to combine comparison and categorization models together, each though responsible for processing metaphors at a different stage in the life of the metaphor. In the following subsections, I first look at the categorization model,

then look more specifically at the hybridity of the CofM, and finally address the analogical system of structure mapping that occurs during the processing of novel metaphors.

### Metaphor as “class-inclusion” Assertions

To begin a discussion about the CofM, it is necessary to first take a look at the work done by Glucksberg and colleagues (Glucksberg & Keysar, 1993; Glucksberg, 2003) and their category membership model of metaphors. According to categorization models, metaphors establish class-inclusion relations between two distant concepts. For example in the following metaphor “life is a lottery”, the target concept of the metaphor (life) is assigned to an ad hoc category that the base (or source) concept of the metaphor (lottery) refers to and is a prototypical exemplar for this category (e.g., something that is won by chance, luck, not fair) (see Glucksberg & Keysar, 1990). The target concept then inherits some of these features. So in categorization models of metaphors, the target concept is subordinate to the base concept and not on the same level of abstraction (Gentner, Bowdle, Wolff, & Boronat, 2001). While the category assertion comes from the base, it interacts with certain modifiable dimensions that are part of the target (life), and in the above example, this could involve such things as birth and upbringing, family, degree of wealth, and so on. It is this interaction between the category and these dimensions that leads to the interpretation of the metaphor (Glucksberg, McGlone, & Manfredi, 1997). Gluckberg (2003) maintains that this process of attribute categorization can be applied to both novel and conventional metaphors. He suggests that the more apt metaphor will be processed through this attribute categorization while less apt metaphors may not, so it is not about conventionality, but about the aptness of the metaphor.

## The Hybrid Model: From Comparison to Categorization

In contrast, according to CofM, Gentner and colleagues (Bowdle & Gentner, 2005; Gentner et al., 2001) assert that metaphors progress along a continuum as they increasingly become conventionalized in language, so in essence, they follow along a career path of escalating prominence and this in turn changes how they are represented and processed. As a novel metaphor loses its novelty, it goes from being processed as a comparison to that of a categorical assertion (as in Glucksberg's model). It is important to note here that CofM makes a clear distinction between novel and conventional metaphors. Gentner and colleagues view that metaphors are represented and processed differently, as they firmly state, "the proposal that metaphor is a species of categorization ... is fundamentally wrong for novel metaphors" (Gentner et al., 2001, p. 233).

Distinguishing between conventional and novel metaphors is a key element in the evolutionary life of a metaphor according to the CofM hypothesis and this in turn will have an impact on the processing speed of these two different types of metaphors. In the previous chapter, I talked about the differences between the traditional and contemporary view of metaphor processing. Again, the traditional view (Grice, 1975; Searle, 1979) provides unconditional priority to the literal interpretation and then once a rule violation has occurred, a metaphor interpretation is triggered, resulting in a sequential process. In this view, metaphor interpretation is more difficult and takes more time to process. The contemporary view (Gibbs, 1994; Glucksberg & Keysar, 1990; Keysar, 1989) maintains that metaphoric language is processed directly and does not require additional effort or time. Therefore both literal and nonliteral language are automatic and obligatory. Yet this

contemporary view assumes that all metaphors are the same and fails to take into account differences in processing times between conventional and novel metaphors.

Blasko and Connine (1993) conducted a study that examined the comprehension of metaphors varying in familiarity and found that the figurative meaning of high-familiar metaphors are readily available, but not so for low-familiar metaphors. Though for low-familiar metaphors, the aptness rating played a significant role in the figurative activation. So for high-familiar metaphors, the direct-access or contemporary view of metaphor is applicable, yet apparently not as relevant for novel and less-familiar metaphors. Gregory and Mergler (1990) also confirmed the distinction that processing novel or more abstract metaphors requires additional processing. Blank (1988) suspects that this distinction is due to the likelihood that ordinary and highly conventional metaphors probably exist as lexical entries or as lexicalized metaphors. Gentner and Wolff (1997) explain that the differences in processing time between such conventional and novel metaphors is due to the fact that the bases in the more conventional metaphors have already abstracted a metaphorical sense, yet for the novel metaphors this metaphorical sense needs to be derived via alignment.

#### Metaphor and Analogy: Structure Mapping Theory

Kintsch (2008) likewise claims that not all metaphors are the same and depending on the type of metaphor the mind will accordingly process it in a variety of ways. “The simplest metaphors are processed in the same way as literal statements, while more complex metaphors require analogical reasoning” (p. 129). Similarly, according to CofM, “metaphor is like an analogy” (Gentner et al., 2001) where many metaphors though not

all are comparisons based on systems of shared relations between two semantic domains, especially present in the classical nominal metaphors that follow the “X is Y” format.

These relational metaphors can be contrasted with attributional metaphors that are simply formed based on appearance similarity, as in the previous example, “the river is a snake”.

Gentner and colleagues (Gentner, 1983; Gentner & Markman, 1997) developed a structure-mapping theory for the interpretation of metaphors. According to this theory, interpreting metaphors progress through two stages: alignment and projection.

The structure-mapping process (Gentner & Wolff, 1997), in contrast to CMT, does not view the comprehension of metaphors as being only asymmetrical. Rather an initial stage occurs that is role-neutral between the two representations, entailing a symmetrical structure alignment. Wolff and Gentner (2000, 2011) in a number of studies that used forward and reversed metaphors (Some suburbs are parasites / Some parasites are suburbs) found that the difference in comprehensibility between them increased with processing time. This they interpreted as an initial (neutral) alignment, which then afterwards was followed by a directional inference process. This directional processing is guided by the initial alignment where inferences from the base are then projected onto the target (Wolff & Gentner, 2011).

Alignment requires looking for relational structure that has both one-to-one correspondence and parallel connectivity between elements in the base (vehicle) and the topic (Falkenhainer, Forbus, & Gentner, 1989). For example in the following metaphor “Memories are falling leaves”, predicates are matched (i.e., the relations *forget* and *fall*) then the elements in the topic (memories, mind, forgotten memories) and the base (falling

leaves, tree, scattered leaves) are placed in correspondence as follows: falling leaves → memories, a tree → the mind, forgotten memories → scattered leaves. Each has a one-to-one correspondence and there are many other possible correspondences that could be aligned. This structural alignment matches and highlights the similarities between these two relational spaces. Once the alignment emerges it guides the following stage in the process of comprehension called inferential projection. This projection involves choosing a preferred interpretation something similar to the following, “from our experiences in life, we have accumulated many memories, but these memories are fleeting and with the passage of time they will soon be forgotten.” In novel metaphors, “the target concept is structurally aligned with the literal base concept” (Bowdle & Gentner, 2005, p. 199).

According to CofM this is a very different process of metaphor comprehension than if one encountered a highly conventional metaphor like “Wikipedia is a goldmine of information”. Here goldmine has two closely related and linked senses or a dual reference (see Glucksberg, 2001), “a place where gold is mined” and “a source of wealth”. Wikipedia is then seen as a member of this superordinate metaphorical category, “a source of wealth for information”. Bowdle and Gentner (2005) summarize the differences between the comparison and categorization models for the processing of novel and conventional metaphors respectively as the following, “novel metaphors invite sense creation, but conventional metaphors invite sense retrieval” (p. 199). This is a key difference, the idea of “creation” and “retrieval” as distinguishing between novel and conventional metaphors that I further elaborate on in section 3.3 about the brain, salience, and novelty.

### Conventionality and Aptness

Some have questioned the strength of the CofM theory pointing out that aptness has a more reliable effect on metaphorical processing than conventionality (Jones & Estes, 2006). Conventionality refers to the strength of the relationship between the vehicle and its corresponding figurative meaning, so in the previous example (life is a lottery) “lottery” is not as conventional as “journey”. The more conventional a metaphor becomes, the more clichéd it may sound, as in “life is a journey”. Aptness on the other hand is not about conventionality or novelty, but about the vehicle having a salient property for attribution, in addition, this property needs to be relevant to the topic (Jones & Estes, 2006). It is unquestionable that for novel and conventional metaphors aptness plays an important role in comprehension and also may influence the career of the metaphor. For instance, more apt novel metaphors will more likely proceed along the path towards conventionalization while less apt ones likely will fade out quickly. When looking at metaphor production, it is important to consider not only novelty and originality of the metaphor, but also the aptness of this connection. Novelty without aptness is closer to an anomaly and aptness without novelty is a conventional metaphor.

### Summary of the Career of Metaphor Hypothesis

In short, CofM views metaphors existing along a continuum. On the one side are novel metaphors and on the other side of this continuum are highly conventional and familiar metaphors. The latter relies more on linguistic knowledge and the former relies more on higher-order cognitive processes, as well as, linguistic knowledge (see Figure 3.1).

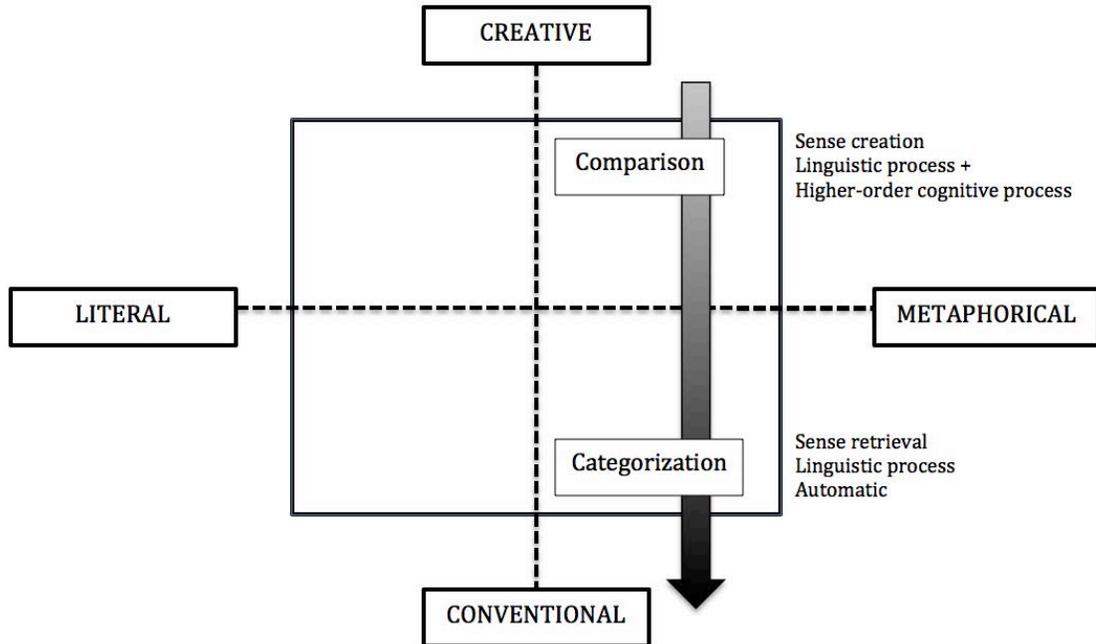


Figure 3.1: The movement from creative to conventional metaphors in the CofM theory

In this study, I compare a first and second language and risk misinterpreting the data in the foreign language. For foreign language learners, who have not yet acquired the necessary linguistic codes, might not be able to even understand the language in the metaphor production tasks or have the sufficient language necessary to complete them in the L2. In a first language this could be attributed to a motivational or cognitive breakdown (since linguistic knowledge is a general assumption), but in a foreign language (where linguistic knowledge is more unascertained) interpreting the data as a breakdown at the cognitive or motivational level would be a gross misinterpretation for in fact it is a breakdown at the linguistic level (e.g., unfamiliar vocabulary in the metaphor tasks or lack of linguistic knowledge to complete the tasks). Therefore in this study it is crucial to design tasks that rely less on one's linguistic knowledge of conventional expressions and more on one's ability to produce creative metaphors from highly simplified prompts.

Vocabulary knowledge is important in developing semantic relationships in an L2; this includes both the amount (breadth) and quality (depth). It is hypothesized that there is a threshold level for *creative metaphoric competence* in a foreign language. *Creative metaphoric competence* requires some minimal linguistic knowledge in the target language, but once one has that level, additional vocabulary knowledge will not have any relationship in increasing one's ability to produce creative metaphors (similar to the threshold theory in creativity research and the relationship between IQ and creativity) (Getzels & Jackson, 1962).

In the next section, I will address another important topic in regards to novelty and this has to do with salience. This approach to metaphor comprehension strongly challenges the traditional literal/nonliteral dichotomy and instead stresses the importance of salience rather than figurativeness, as determining the ease and speed of comprehension.

### 3.2.3 GRADED SALIENCE HYPOTHESIS

The Graded Salience Hypothesis (henceforth GSH) (Giora, 1997, 2003) is an approach to language processing that puts privileged status on salient meanings. These “coded meanings” are “foremost on our minds due to conventionality, frequency, familiarity, or prototypicality – are accessed faster than and reach sufficient levels of activation before less salient ones” (Giora, 2003, p. 10). So the literal or metaphorical nature of the expression is irrelevant for the salience of the expression has the greatest effect on the process of using and comprehending language. In consequence, the conflict between a multi-stage or direct-access processing model of metaphors would become indistinct for

it would not be about a literal/nonliteral division, but about the degree of salience the expression has regardless of how figurative it might be. Moreover contextual information may have predictive and a facilitating effect on language comprehension, nonetheless it runs in parallel to lexical information and although it may speed up the processing of the language, it does not interact with lexical processing (Giora, 2003).

### Optimal Innovation

As far as processing metaphorical language, according to GSH (Giora, 2003), differences will occur between familiar and unfamiliar metaphors. Unfamiliar or novel and creative metaphors take more time to process and are more susceptible to contextual effects. As previously stated, GSH considers salience to be what is foremost “on our minds”, then novelty could be considered what is “out of our minds”. Giora (2003) and Giora and colleagues (Giora et al., 2004) formulated and developed the Optimal Innovation Hypothesis, which suggests that novelty, too, is a matter of graded innovativeness. For “optimal” innovation, there naturally needs to be novelty, but in this novelty one also has to be able to recognize the familiar. Novelty arises more from “de-automatizing salient meanings than by inventing entirely new ones” (Giora, 2003, pp. 179-180). Novel language is not completely novel, but has elements of the salient and familiar within it, as well as novelty, and this provides the pleasure in innovative language (Giora et al., 2004).

The Optimal Innovation Hypothesis provides an alternative explanation to two dominant theories of language and aesthetics. On the one hand are fluency theorists who predict that people have a preference and a greater positive attitude towards easier to read text and familiar language (Topolinski & Strack, 2009; Zajonc, 1968). The early work by

Zajonc (1968) prompted a substantial amount of research on the relationship between cognition and affect. Zajonc (1968) found that the positive valence one applies to an unknown stimuli (e.g., faces, ideographs, words) is based on frequency and simple “mere-exposure” can in turn increase this valence and this exposure does not have to be conscious exposure, but can also be subliminal (Zajonc, 2001).

In this view, when there is high fluency in the processing of an object, this will in turn automatically elicit a positive affect and consequently a more positive aesthetic response (Winkielman, Schwarz, Fazendeiro, & Reber, 2003; Reber, Schwarz, & Winkielman, 2004). These cognitive feelings of positive valence appear in facial expressions activating the smiling muscle when reading word triads that had high conceptual fluency (Topolinski, Likowski, Weyers, & Strack, 2009). Topolinski and colleagues (2009) used triads that had either hidden semantic coherence (e.g., SALT DEEP FOAM) or incoherence (e.g., DREAM BALL BOOK). The coherent triads were viewed as having high conceptual fluency due to the possibility of a remote association (e.g., SEA). This connection between high fluency and a positive affective reaction is due to the belief that the fluency signal is hedonically marked (Winkielman et al., 2003). In this framework, prototypes are also viewed as being highly attractive (Winkielman, Halberstadt, Fazendeiro, & Catty, 2006). In short, this approach to novelty, grounded in the biological, infers that humans have a natural tendency to avoid the unknown, which could be potentially threatening and harmful (Zajonc, 1998). According to this view, “[n]ovelty is thus commonly associated with uncertainty and with conflict—states that are more likely to produce negative than positive affect” (Zajonc, 1968, p. 21).

In sharp contrast are researchers like Berlyne (1960), who view exploration and curiosity to be essential features of human nature and consequently novel stimulus will be preferred over the familiar. In one experiment, he showed that participants' rated scores of "pleasingness" and "interestingness" correspondingly increased with the novelty of the stimuli (Berlyne, 1970). The incongruity and novelty of a metaphor induces a sense or need to resolve this incongruity by way of a "conceptual resolution" of the disparate elements (Paivio & Walsh, 1993). As for this thesis, it is likewise suggested that a creative metaphor that is "optimally" novel will deviate from the familiar, triggering a sense of exploration and curiosity, and consequently affecting one's sense of pleasure and interest in the linguistic stimuli.

In a similar argument, the Russian Formalists emphasized the notion of making things "strange" (*ostranenie*). For instance, Shklovsky (1998) viewed perception as a process of automatization (or habituation) and this provides the "greatest economy of perceptive effort" (p. 15) and therefore art or creativity, in general, is to make things "unfamiliar" or more difficult because this defamiliarization increases the length of perception and this process "is an aesthetic end in itself" (p. 16). Likewise, the Czech Structuralists (Mukařovský, 1964) used a concept referred to as foregrounding (*aktualisace*). "Foregrounding is the opposite of automatization, that is, the deautomatization of an act ... automatization schematizes an event; foregrounding means the violation of the scheme" (Mukařovský, 1964, p. 19 as cited in Miall & Kuiken, 1994, p. 390). Miall and Kuiken (1994) used these theories to propose "that the novelty of an unusual linguistic variation is defamiliarizing, defamiliarization evokes feelings, and feelings guide 'refamiliarizing' interpretative efforts" (p. 392). This defamiliarization and

deautomatization process, commonly found in creative metaphors, captures the readers attention, enhances interest in the text, increasing the cognitive workload and this slows down the cognitive processes allowing for an increased level of feelings to emerge.

According to the Optimal Innovation Hypothesis, which is more of a blend between these two opposing views, states that within this novelty and the departure from the ordinary, an element of familiarity must be recoverable in order for it to be “optimal” and most pleasing. Finding this salient feature in a creative metaphor is what has been argued as “a sense of strong personal aesthetic delight” that “derives from the phenomenon that can be termed *order out of chaos*” (Davis & Hersh, 1981, p. 172).

Creative metaphors naturally involve originality, novelty, and newness, as well as, being meaningful, as in, having apt relations between the two domains, but they also invoke the positive emotions of pleasure and interest. In Figure 3.2, using Giora’s (2003) Optimal Innovation Hypothesis and a modification of The Wundt Curve that Berlyne (1970) used, I show the arousal potential of creative metaphors. Creative metaphors are those that are optimally innovative, which means that they allow “the recognition of the familiar in the novel” (Giora, Fein, Kotler, & Shuval, 2015, p. 142). They also have the highest hedonic value and as a result should be viewed as being most pleasant and preferred over ones that are very familiar and conventional or those that are completely new and original (i.e., those that do not allow for the recoverability of the familiar).

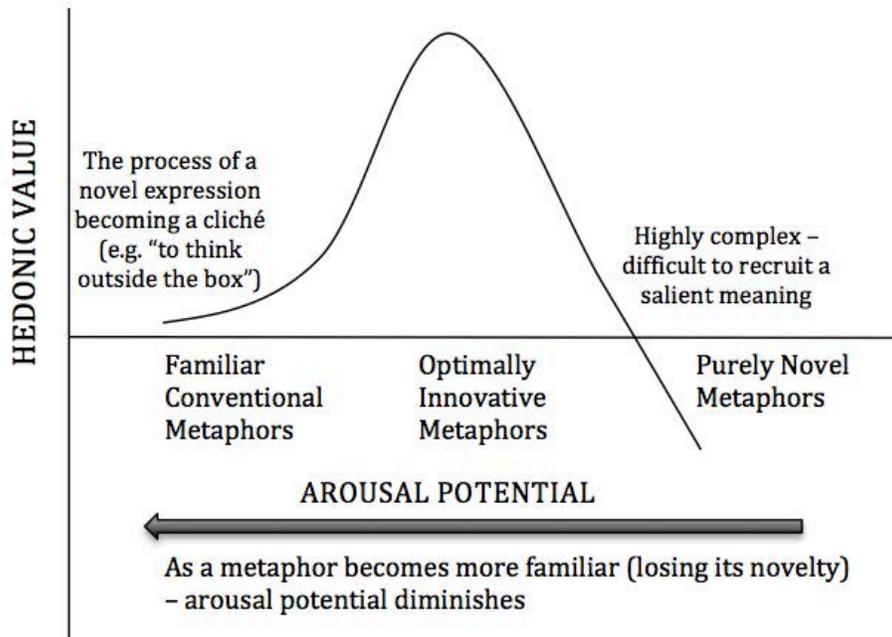


Figure 3.2: The hedonic value of metaphors and arousal potential based on the Optimal Innovation Hypothesis (Giora, 2003) and the Wundt curve (Berlyne, 1970)

### Summary of Graded Salience Hypothesis

GSH adds two parts to this thesis. First, it constrains creative metaphors under the optimal innovative hypothesis, which suggests that creative metaphors not only need to be original and new, but also allow for the recoverability of the familiar within this novelty. Secondly, it accentuates the importance of aesthetics in judging a creative metaphor. This will be further discussed in the last section of this chapter on ways to measure *creative metaphoric competence*. In the next section, I further elaborate on how novel and conventional metaphors differ at the anatomical level in how they are processed in the brain.

### 3.3 DIFFERENTIATING CREATIVE FROM CONVENTIONAL METAPHORS: THE BRAIN

The neuropsychology of metaphor provides further support to distinguish at the neural level how conventional and creative metaphors are processed differently. Again to reiterate the goal of this chapter is to provide a working framework to be able to talk about *creative metaphoric competence*, as something that is distinct from an overall metaphoric competence. In this regard, it is important to restrict the term to the combinatorial ability of bringing together two distantly related semantic fields together in a novel way that at the same time has certain apt relations. It is the unexpectedness of finding meaning within this novel combination that has the power to “still excite the imagination” (Brooks & Warren, 1979, p. 436). In contrast, conventional metaphors are habitual and automatic, entrenched within an established semantic network. The following section looks at the neural basis of metaphor processing and how this provides further support to the theories previously discussed (in particular CofM and GSH).

#### 3.3.1 LANGUAGE AND THE BRAIN: THE LEFT HEMISPHERE

For most neurotypical individuals (especially right-handers) the left hemisphere (henceforth LH) in such traditional areas as the Broca and Wernicke areas and the angular gyrus have important functions for language processing. Broca in the late 19<sup>th</sup> century was the first who discovered a region in the left hemisphere of the brain (that subsequently was named after him) that if damaged would result in a disorder of spoken language (aphasia), though if damaged in the same area on the right side, language would remain intact (Geschwind, 1972). This LH lateralization of language has been

documented to be the case where 97 out of 100 people with permanent language disorders have damage on the left side (Geschwind, 1972). The LH is the dominant area for language processing for it “finely codes” information and “strongly activates small and focused semantic fields” that is related to the relevant and literal meaning while suppressing other irrelevant meanings (Jung-Beeman, 2005, p. 514). This allows one to process language with speed by maintaining a narrow focus. The LH is also “more suited for comprehending sentences because it uses grammatical information and sentence constraint to integrate sentence meaning” (Kacirik & Chiarello, 2007, p. 189). The LH is undoubtedly crucial for language comprehension, yet in contrast, what role the RH plays has been considerably more controversial and inconsistent.

Understanding how language processing works at the neural level usually involves two different types of techniques; looking at patients with lesions (from a stroke, accident, etc.) or using some form of brain imaging device (PET, fMRI, etc.). Early research that sparked great interest in the RH as the preferred substrate for metaphor processing came from Winner and Gardner (1977). They questioned the over-simplified view of the LH as the “*language*” hemisphere and the RH as the “*aesthetic*” hemisphere. From their study they concluded that an “intact left hemisphere does not of itself ensure adequate comprehension of all linguistic messages” (p. 725) and that the interaction between each hemisphere contributes to fully adequate linguistic and aesthetic functioning. They also highlighted the possibility that the RH is especially necessary for the mapping of figurative language. This has led to a tremendous amount of interest and research about the role of the different hemispheres in language comprehension and in the next subsection I explore how the RH is involved in the processing of metaphors.

### 3.3.2 LANGUAGE AND THE BRAIN: THE RIGHT HEMISPHERE

In this section, I start with an early study that provided evidence to support the RH involvement in processing novel metaphors and then introduce some studies that contradict and question this involvement. I then follow this up with more recent studies that again insist that the RH is involved, especially in comprehending novel metaphors. I argue that most of these contradictory findings are likely based on the task and the novelty of the metaphors used in the studies.

Bottini and colleagues (1994) made an early contribution to the growing view that the RH is involved in metaphorical processing. They used a PET (positron emissions tomography) image scanner and showed that the distance between the two semantic domains of a metaphor, as well as the unusualness or newness of the semantic relations recruits areas of the RH. In this study, six participants performed a metaphorical sentence task (e.g., “The investors were squirrels collecting nuts”), a literal sentence task (e.g., “The old man has a branch as a walking-stick”), and a lexical-decision task while investigating cerebral activity and found not only activation in the LH, but also in a number of areas in the RH for the metaphor sentence tasks. More specifically, they observed significant activation in the following areas of the right hemisphere: prefrontal region (BA8/46), middle temporal gyrus (BA21), precuneus (BA31), and the anterior and posterior cingulate (BA32/31) (see Figure 3.3 & 3.4 to view the locations of these regions in the brain). They concluded that the frontal lobe was used to retrieve episodic memory and the precuneus, which has previously been associated with memory-related imagery (Fletcher et al., 1995), also likely had a role with long-term memory. This suggests that metaphor requires greater working memory resources than the corresponding literal

sentences. Heightened activation in the anterior cingulate cortex (ACC) has been shown to occur in tasks that require attention and effortful thought (Davis et al., 2000).

Moreover, as apparent in the above examples, they used novel metaphor stimuli, to which they suggest the RH involvement has a role in dealing with complex language. Despite the success of this study in showing the activation of the RH for metaphor processing, not all subsequent studies since then have been so conclusive. There is still a considerable amount of controversy around the functional architecture of metaphors and whether or not the RH is necessary for metaphor comprehension.

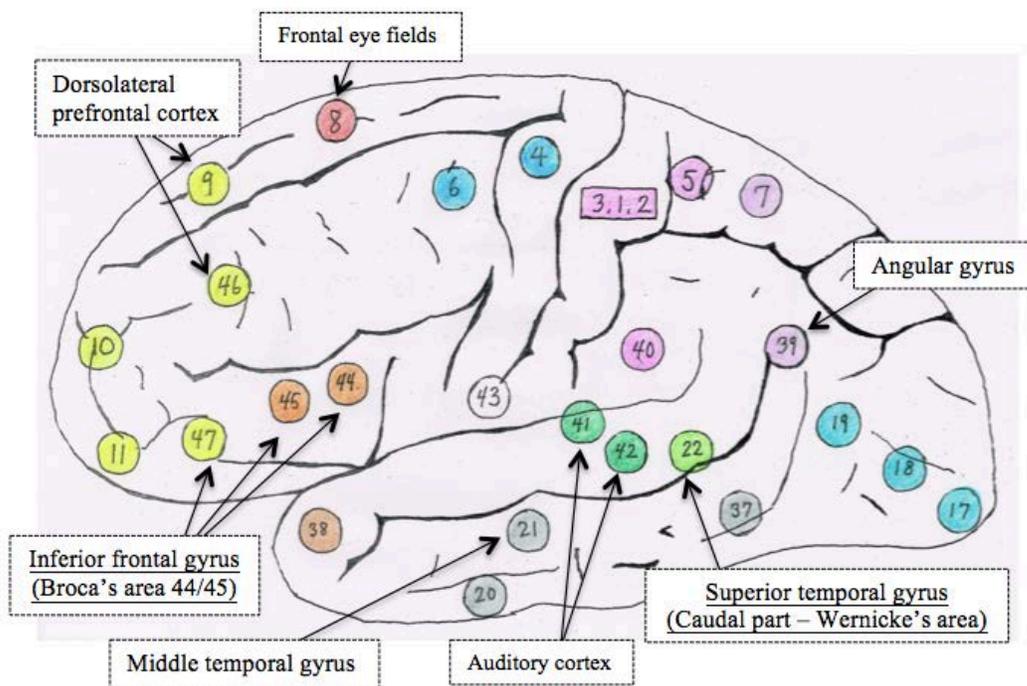


Figure 3.3: The lateral view of the brain with Brodmann areas marked by number. The colors represent function (i.e., blue-green of 17, 18, 19 represent the visual cortices; pink of 3, 1, 2, 5, and 40 are somatosensory areas; blue of 6 and 4 are motor areas; the yellow are for cognition, and so on).

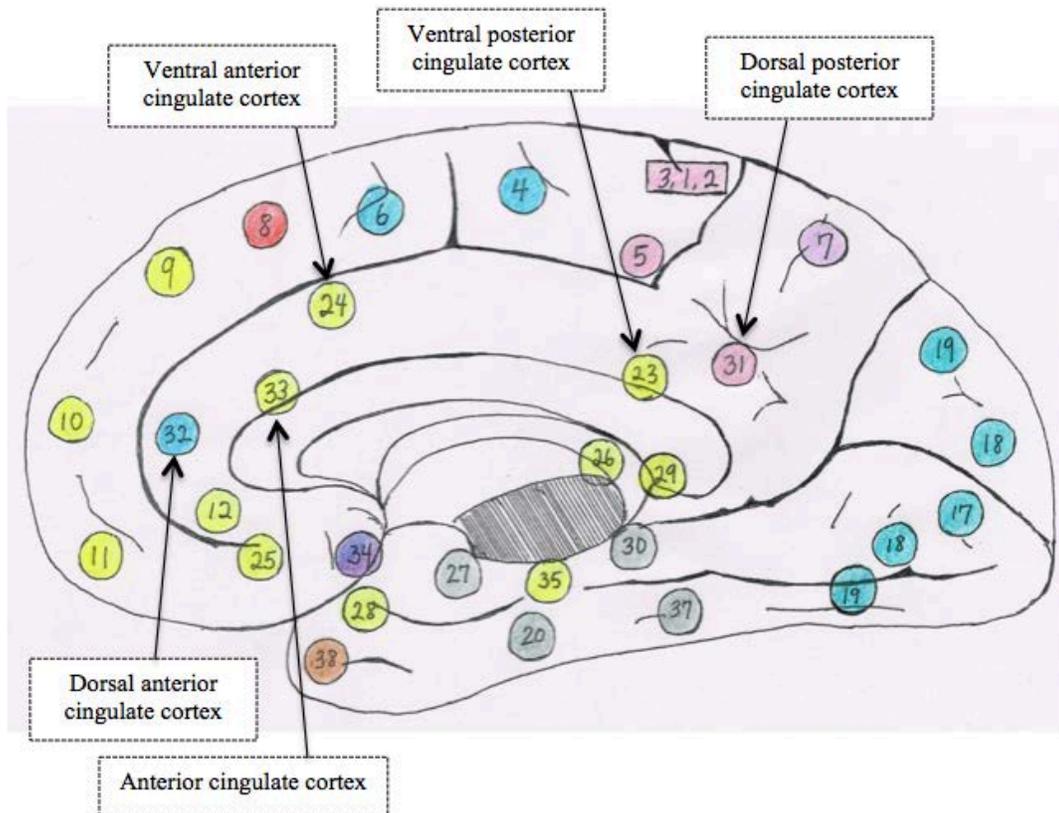


Figure 3.4: The medial view of the brain with Brodmann areas marked by number. A number of the regions correspond to regions found in Figure 3.3 like the back visual cortices.

In contrast to the above findings, a number of studies have found a lack of evidence for a RH involvement in the processing of metaphors (Eviatar & Just, 2006; Lee & Dapretto, 2006). Although it should be noted, these studies primarily used conventional metaphors in their research. One important finding from these studies is that conventional metaphors are accessed much like any other lexical items and are likely retrieved from a mental lexicon. In contrast to these studies that primarily used conventional metaphors, Rapp and colleagues (2004) using simple novel metaphors (e.g., “the lovers words are harp sounds” as compared to “the lovers words are lies” for literal) also reported only LH involvement. They suggest, “the right hemisphere theory of metaphor comprehension needs to be critically reevaluated” (p. 401). They do note that

the conflicting results between those who have found RH involvement and those who have not might be due to differences in the complexity of the tasks involved in the different studies. In another study (Rapp, Leube, Erb, Grodd, & Kircher, 2007), participants simply had to judge whether or not a sentence had a metaphoric or literal content. Again they found no significant laterality effects between the metaphorical and literal sentences. They suggest that RH involvement might be based not on the figurativeness of the sentence, but on “salience, novelty, or semantic distance” (p. 147).

Many of the studies within neuroimaging research have attempted to distinguish conventional from novel metaphors by using the theoretical grounds of GSH and/or CofM for the experiments. Looking at the neural correlates of metaphor processing and the role of the RH, Mashal and colleagues (2005; 2007) provide strong evidence for RH involvement. Through analyzing fMRI data, they concluded that the right homologue of Wernicke’s area (BA22/42) has a unique role in the processing of novel metaphors, as compared to conventional metaphors. In addition, Mashal & Faust (2009) demonstrated that as an individual is repeatedly exposed to novel metaphors, there is a shift in hemispheric involvement from the RH to the LH. In a similar study, Cardillo et al. (2012) showed involvement of “the right hemisphere in the processing of novel, low salience figurative meanings”, but instead of a lateral shift from the RH to the LH as the metaphor becomes more conventionalized, there is rather a “decrease neural load within semantic networks” (p. 3212). This they interpreted as giving credence to the CofM theory and the proposal that as a metaphor becomes more familiar, the processing of it shifts from comparison to categorization and this “entails a honing of the neural networks *within* a region as opposed to across regions” (p. 3219). In still another study, using sentences as

the metaphor task, Schmidt and colleagues (2007) also found strong RH involvement in the processing of metaphors. They attributed this not to a metaphor/literal dichotomy, but to the degree of semantic relatedness. They also endorse the idea that RH involvement may not be solely based on salience or familiarity, but also on complexity and aptness of the metaphor.

Since the research in this thesis was conducted in both English and Japanese, it is significant to note that the studies reported here have not only been in English, but in an assortment of languages; German (Rapp et al., 2004; 2007), Hebrew (Mashal et al., 2005; 2007; 2009), and Italian (Bambini, Gentili, Ricciardi, Bertinetto, & Pietrini, 2011). Other languages have also been studied using fMRI. Ahrens et al. (2007) looked at the processing of conventional and anomalous metaphors in Mandarin Chinese and found bilateral activation and RH recruitment for anomalous metaphors. They conclude and suggest, “[n]o longer can conventional and novel metaphors be grouped together into a ‘metaphor’ group as compared with literal expressions” (p. 169). Neuroimaging and metaphor processing has also been investigated in Japanese. Shibata and colleagues (2007a) found weak evidence for RH involvement, but did find that metaphor comprehension involved different neural mechanisms for semantic processing, as compared to literal comprehension. In another study, using a metaphoricity judgment task based on three types of “A is B” copula sentences; metaphorical (e.g., 教育絵は階段だ “education is a staircase”, literal (e.g., ピアノは楽器だ “A piano is an instrument”), and anomalous (e.g., 温泉は英語だ “A hot spring is English”), they showed higher activation of RH involvement in the comprehension of metaphors, in contrast to literal

sentences, especially in the inferior frontal gyrus (IFG) (BA47) (Shibata, Abe, Terao, & Miyamoto, 2007b).

Attempts have been made to gather data from all these different studies and analyze them in a meta-analysis. Bohrn and colleagues (2012) performed a quantitative analysis of neuroimaging studies that looked at figurative language processing and specifically those that looked at the role of the RH. They did not find any RH advantage for figurative language processing, but when analyzed contrasting novel and conventional metaphors, they report “robust RH activation” (p. 2681). This bilateral activation was primarily in two RH clusters, the right IFG (BA45) and the right anterior cingulate cortex (ACC) (BA32). The IFG has been shown as being involved in connecting distantly related semantic concepts together in analogical reasoning tasks (Green et al., 2009), ideation generation tasks (Mihov et al., 2010), and divergent thinking tasks (Goel & Vartanian, 2005). Since novel metaphors also link distantly related concepts together in new and appropriate ways, require ideation and divergent thinking, it can be ascertained that novel metaphors likely result in similar increased activation in the IFG.

In a more recent study, Yang (2014) also conducted a meta-analysis of fMRI studies that looked at the role of the RH in metaphor comprehension. She concludes that there are three factors that modulate RH involvement in metaphor processing, as compared to literal comprehension. They are conventionality, contextual complexity, and task demand. Since novel metaphors cannot be retrieved from the mental lexicon, the figurative meaning has to be inferred and created and this often involves recruiting broader semantic networks in order to interpret the meaning.

Finally in a critical look at the neural basis of metaphor, Schmidt and colleagues (2010) call to attention the need to “go beyond simple laterality” and propose some important considerations for these inconsistent results. They suggest that it is essential to pay more attention to novelty and consider the effect of the lexical (e.g., nouns, verbs, adjectives) choice of the task. That is to say, there are many factors that play a role in activating greater RH involvement in the processing of figurative language, but for the purposes of this study, the point of this section is to highlight the fact that novelty plays a role in this and therefore creative metaphors, as presented in the studies above, are processed differently than literal and conventional expressions and require more cognitive effort and bilateral activation. In order to provide a general overview of the lateralization differences in language processing, a theory called *coarse-semantic coding theory* (CSC) (Jung-Beeman, 2005), is described in greater detail in the following subsection.

### 3.3.3 THE BILATERAL BRAIN AND CREATIVE METAPHORS: COARSE SEMANTIC CODING THEORY

As indicated in the start of this section, the LH is the presumed hemisphere for language processing. Figurative language processing shares many of these areas, but also recruits parts of the RH, especially in the case of novel metaphors. Jung-Beeman (2005) asserts in his CSC theory that both hemispheres are actively involved, though each with a different role, as word meanings are organized in different ways in each hemisphere. The LH is for “rapid interpretations and tight links”, this occurs quickly, but focuses on a more narrow number of related concepts and does not spread far from these. In contrast, Jung-Beeman (2005) argues that the RH performs, what he calls, coarser-semantic coding, which is for

the “maintenance of broader meaning activation and recognition of distant relations” (p. 517), so it is more “diffuse” and activates more distantly related lexical-semantic networks. Since metaphors capitalize on distant semantic relations between words, he notes that this is especially true in the case of “metaphors that are more novel, more creative, and less salient” (p. 515).

Faust and Kenett (2014) call this fine and coarse semantic coding between the hemispheres as a “rigidity-chaos semantic continuum”, where the LH is rigid and rule-based and the RH is chaotic and over-flexible. The rigidity of the LH is crucial for efficiently processing language. In contrast, creative language (like metaphor) involves rule-violations and interrupts dominant semantic relations, so it involves chaos – the unknown, the unexpected, and the disruption of the conventional. According to their view of creativity, rigidity and chaos have to be integrated together and find some balance for creativity naturally involves novelty, but it also has to be appropriate and in the case of a novel metaphor, the relations have to be apt. This is very similar to the Optimal Innovative Hypothesis that argues the most pleasing of creative language involves the recoverability of the familiar within the novel. Many researchers now are beginning to accept this idea of bilateral activation and “hemispheric cooperation in creative and metaphoric language processing” (Faust & Kenett, 2014, p. 3).

#### 3.3.4 SUMMARY OF THE BRAIN AND CREATIVE METAPHORS

In conclusion to this section, neuroimaging studies have clearly distinguished between conventional and novel metaphors at the neural level. However it should be emphasized that it might not simply be a measure of figurativeness, but more about novelty and

complexity, as Giora (2007, p. 113) states, it is about “singling out not the figurative but the innovative—that which gives everyday speech ‘an unfamiliar air’”. Non-salient (non-coded, novel) meanings must be searched for and not retrieved from a mental lexicon (salient, coded). In novel and anomalous metaphors, there is a semantic violation and according to the CofM theory, this requires one to first symmetrically align relations between the two concepts and then asymmetrically project inferential meaning from the base to the target. This “mental linkage” increases the neural load on the semantic processing system (Cardillo et al., 2012) and individual differences may play an important role both in interpreting the relations in novel metaphors and producing novel metaphors.

It should be noted here that these studies focused on a single first language and to my knowledge there have not been any neuroanatomical studies that address novel processing of metaphors in a second language. What would happen if a researcher looked at the same individuals performing the same novel metaphor tasks, but one being completed in an L1 and the other in an L2? It is suggested in this thesis that the same neural substrates would be active in both languages.

### 3.4 A FRAMEWORK FOR DIFFERENTIATING CREATIVE METAPHORS

In the previous sections, I outlined different theoretical claims that differentiate novel and creative metaphors from conventional ones. CMT describes novel metaphors as imaginative extensions or elaborations on existing conceptual structures. In some instances novel metaphors actually create new conceptual structures between two

distantly related semantic domains, which has the power to reshape the way we view the world. The CofM theory describes the path a metaphor takes from being novel to becoming more conventional in language. Initially novel metaphors require the individual to align the relational structures in a consistent way between elements in the target and source domains. From this aligned structure inferences can be made about the metaphor. Yet as the metaphor becomes more conventional in language, this comparison process turns towards a categorization process. Through repeated figurative use, the source concept in the metaphor establishes an abstract metaphorical category to which the target concept is now included in. The third one, GSH insists that the processing of language is not dependent on the language being metaphorical or literal, but on how salient the language is. As language becomes more familiar, conventional, and frequent, it becomes more salient and this is true for both literal and metaphorical language. The Optimal Innovation Hypothesis substantiates that the most pleasing language rarely is the creation of something completely new and novel or something from nothing, as in *ex nihilo*, but rather combining familiar concepts in new, surprising and unexpected ways where the familiar can still be recovered within the novel. I also addressed novel metaphors from a neurological perspective. A number of studies suggest that when one first encounters a novel metaphor, more neural activation occurs and the brain recruits the RH to actively connect these coarser and distant semantic networks. Figure 3.5 provides an illustrated summary of a proposed model to distinguish creative metaphors and the process of conventionalization.

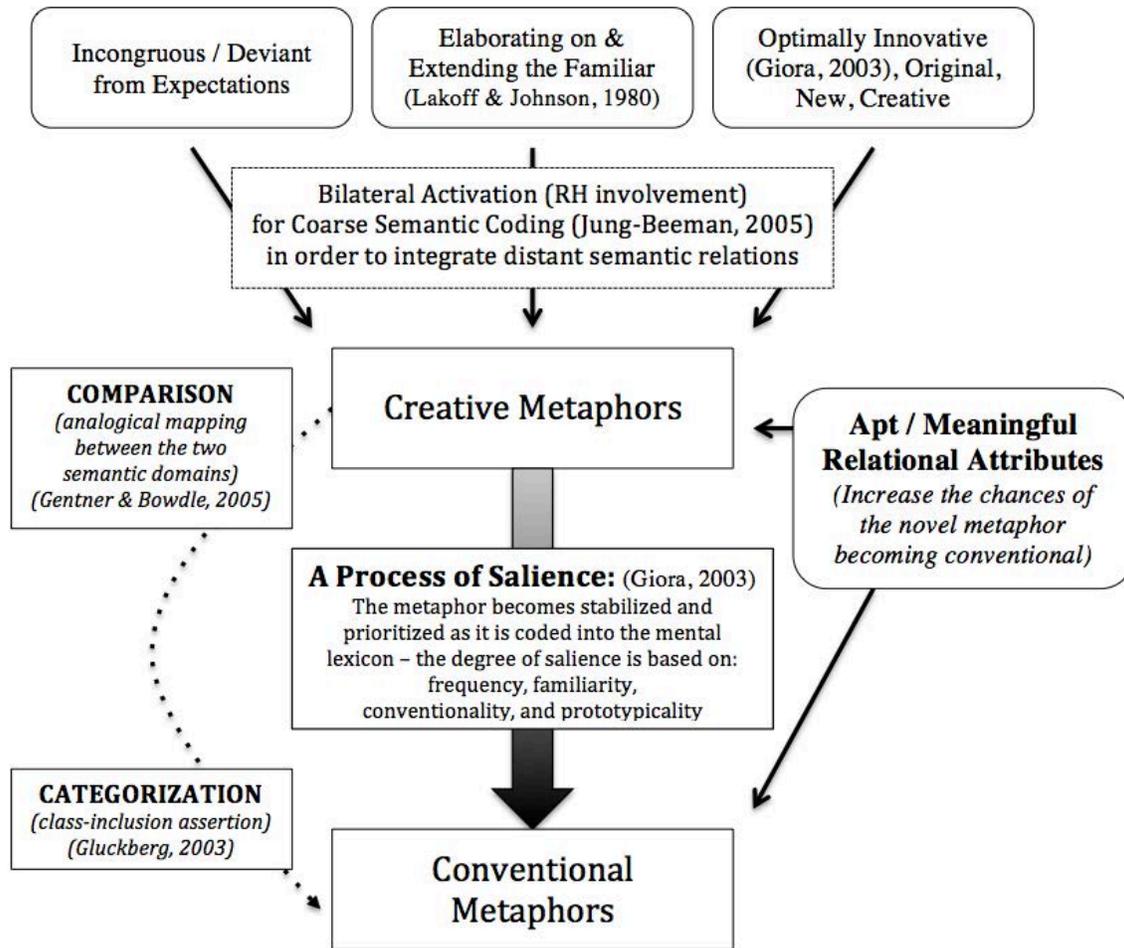


Figure 3.5: Proposed model of creative metaphor processing and the process of conventionalization

The following are some important points to summarize the arguments put forth in the first part of this chapter:

- Metaphors are both creative and conventional and both are common in everyday language.
- A theory of metaphor must clearly distinguish between creative and conventional metaphors for they are processed differently.
- Creative metaphors take more time and effort to interpret.

- Creative metaphors recruit and involve areas in both the right and left hemispheres.
- Creative metaphors often derive from existing conceptual structures though sometimes will actually create new conceptual connections.
- Conventional metaphors are processed much like any other highly salient language: automatic and directly and not as a result of some processing breakdown.
- Conventional metaphors are likely stored in the mental lexicon and are retrieved much like any other ordinary language.

Differentiating creative and conventional metaphors and focusing only on creative metaphors allows me to assess the combinatorial ability found in creative metaphors at an individual level, as compared to assessing the lexical retrieval ability of conventional metaphors. Making this distinction enables me to look at the correlation of *creative metaphoric competence* between an L1 and L2. It is suggested in this thesis that *creative metaphoric competence* is an individual difference and should be found in both languages. Now that I have established how creative metaphors differ from conventional ones, in the final section of this chapter, I look at how one can measure such creativity in an experimental setting.

### 3.5 WAYS TO MEASURE CREATIVE METAPHORIC COMPETENCE

In the previous section, I distinguished *creative metaphoric competence* as the process of producing and interpreting novel metaphors, as compared to the more common and familiar metaphors found in everyday language. My interest in this topic developed from teaching metaphors in the foreign language classroom. I realized while reviewing students' responses to a number of classroom exercises that they varied greatly in

creativity. That is to say, some students responded in novel and surprising ways while others responded in very predictable ways. It could be presumed that these differences were the results of differences in the overall English competences among the students. On the other hand, they could also have been the result of an individual difference. Therefore from this experience, I became interested in seeing whether or not these same differences would also be found if the students were asked to do a similar exercise in their L1. At the same time, I was informally experimenting in my classroom with a number of tasks used in creativity research, which included poems, drawings, and divergent thinking (this will be discussed in more detail in the following chapter). I began to wonder what kind of relationships *creative metaphoric competence* might have with these types of tasks commonly used to measure creativity. One issue, as can be seen in the first part of this chapter, was to develop a way to measure *creative metaphoric competence*, as something separate than having a wide linguistic knowledge of many conventional metaphorical expressions or possessing a great wealth of vocabulary knowledge.

I recognize that to use metaphors in a foreign language, vocabulary knowledge is essential (Azuma, 2004), but this is typically the case for conventional expressions. In regards to creative metaphors, one does not simply retrieve stored multiword chunks of language, but one needs to actively seek out combinatorial possibilities. As Black (1962) stated, “‘dictionary definitions’ may be unnecessary for the comprehension of metaphor” (cited in Gardner & Winner, 1978, p. 31). In fact, earlier studies have shown the connection between language ability and metaphor to be lacking both among children (Johnson, 1989, 1991) and with adult university students (Johnson & Rosano, 1993) to which these researchers suggest “metaphor interpretation may be more a conceptual than

a linguistic task” (1993, p. 169). It is argued here that this is especially true when the research further distinguishes *creative metaphoric competence* from a more general metaphoric competence.

### 3.5.1 FLUENCY, COMPETENCE, AND CLARIFYING TERMINOLOGY

I decided to use the term *creative metaphoric competence*, as a way to distinguish my aims in this research from the various other terms used in the literature that talk about one’s knowledge and ability to understand and use metaphors like “conceptual fluency”, “figurative competence” or “metaphoric competence”. Much of the early work on metaphoric competence approached it developmentally by tracing the course of how children acquire this cognitive ability (Gardner & Winner, 1978), as discussed in more detail in Chapter 2. Interest in how children acquire this metaphoric competence in an L1 led to many researchers exploring how second language learners also acquire such competence in an L2, for it is often asserted that “the true sign of proficiency [...] is the ability to metaphorize in the new language” (Danesi, 1992, p. 193). Conceptual fluency (as previously discussed in the Chapter 2) is the awareness of how a language encodes the conceptual concepts and the subcategory, metaphoric fluency, is the ability to use these structures in everyday metaphorical language. In a later revision, Danesi (2008) further elaborates on the idea of conceptual fluency by not restricting it only to metaphors, but as the underlying knowledge of the conceptual system for all semantic meaning in that language. Conceptual fluency is now “the ability to give appropriate structural form to all kinds of meanings, literal and non-literal that constitute the semantic system of the SL (*second language*)” (p. 233 *italics are mine*). Furthermore he explains it is “the ability to navigate source domains in the SL during discourse programming” (p.

237). Despite being a helpful term that emphasizes the importance of conceptual thinking in language learning, it is an extremely broad construct and provides little in describing how one might actually measure such a thing as conceptual fluency. Also it seems that conceptual fluency here refers to the broad historical, cultural, and conceptual knowledge of the target culture. In my research, *creative metaphoric competence* is more narrowly focused and looks at the individual and the combinatorial cognitive ability to link unlike ideas together and be able to interpret such linked couplings.

Another commonly used term is “figurative competence”. Levorato and Cacciari (1992) developed the concept of “figurative competence” by describing it as containing the following set of coordinated abilities:

- The ability to understand the dominant, peripheral and additional related meanings of a word
- The ability to suspend a purely literal-referential strategy
- The ability to use contextual information in order to construct a coherent semantic representation and to integrate it with the lexical and semantic information carried by the figurative expression
- The ability to create and understand the figurative uses of a word, a sentence or a given domain as well as to retrieve the conceptual structures involved (p. 416-417)

Again many of these descriptions are rather problematic for my research and attempt to design a way to measure *creative metaphoric competence*. For instance (2) assumes that a literal-referential strategy is a priority and needs to be suspended, which is problematic considering the linguistic processing models that I have previously discussed, especially GSH. Also in this research the participants are explicitly informed to use metaphorical

and creative language when completing the tasks, so it can be assumed that they will suspend their “literal-referential strategy”, if such a thing exists. In addition (3) assumes that the metaphor will appear in some discourse and thus have supportive context, but the tasks in this research will mainly use decontextualized linguistic tasks since they may uncover more closely the “cognitive attributes of the subject” (Johnson & Rosano, 1993, p. 160). Despite these issues with the above description of figurative competence, it does provide some insight into the important ability of being aware of peripheral and associable meanings of words (less salient meanings) and then being able to retrieve the necessary conceptual structures in order to produce or interpret an appropriate figurative use of these words.

Low (1988) developed the term “metaphoric competence” and later Littlemore and Low (2006) described in detail this term and demonstrated that it is a key component in Bachman’s (1990) communicative competence model contributing to all areas such as: grammatical, textual, illocutionary, sociolinguistic, and strategic competencies. Again this provides a very broad and theoretical approach with the aim of pointing out to educators and language teachers the importance of a learners’ metaphoric competence in order to communicate effectively in the target language. This view of “metaphoric competence” is more concerned with the “socially interactive function” (Littlemore & Low, 2006, p. 79) of metaphor and so again beyond the scope of this research. In contrast, *creative metaphoric competence*, as used in this research, is specifically focused on how one is able to produce and interpret novel metaphors.

### 3.5.2 DEVELOPING A FRAMEWORK FOR A CREATIVE METAPHOR ASSESSMENT TOOL

The goal of this subsection is to consider ways to develop a valid set of tasks in order to measure, *creative metaphoric competence*, that can provide suitable data for analysis and consequently insight into whether or not this ability projects onto both an L1 and an L2. If this does occur, then scores on these *creative metaphoric competence* tasks between the languages should be minimal, which would suggest that this competency is an individual difference and could also potentially be applied to other modes of expressions, such as, music, dance, and art. In order to structure an instrument to measure this cognitive ability, I relied on various facets that have been identified that are key in measuring this competency from a previous study: (1) the ability to produce an *original* metaphor; (2) the ability to *find meaning* in a metaphor; and (3) the *fluency* of producing many metaphors (Littlemore, 2001a). Below, I describe in more detail these various facets and provide further description how they were applied in this research.

As shown in the first part of this chapter, different cognitive processes are recruited during the processing of novel metaphors and as the novelty wears off, these once novel metaphors become more salient, as they become more familiar, conventional, and frequently used. This may happen more readily than previously thought (Goldstein, Arzouan, & Faust, 2012) and may simply involve, as the Career of Metaphor theory (CofM) suggests, an initial comparison in which the individual attempts to interpret the semantic link between two seemingly unrelated words in a novel metaphor. Then after encountering this metaphor again, this semantic link can be automatically retrieved. Interestingly, a meaningfulness judgment task (where the individual simply judges the aptness of the metaphor) did not produce the same results, as one that required the

participants to interpret the meaning of the metaphor (see Goldstein et al., 2012). So judging the metaphoricity of a novel metaphor and trying to actually interpret and find the meaningful links in it are two clearly different cognitive tasks. Moreover producing a novel metaphor can also be viewed as a different cognitive task from interpreting one. This begs the question whether or not *creative metaphoric competence* can actually be considered a unitary process for there are many constraints to consider, especially in the task choice (Pickens & Pollio, 1979).

*Creative metaphoric competence* involves a number of different cognitive processes. In this study, I concentrate on the production of creative metaphors and subsequent interpretations of them. In order for a metaphor to be judged as being creative, as mentioned at the start of this chapter, it needs to be both novel and meaningful. Novelty refers to it being new, original, and unique. A metaphor is viewed as being meaningful when an individual is able to interpret it. That is to say, one is able to explain the appropriate relations between the two concepts and elaborate on them. Furthermore when assessing the overall aptness of a metaphor, it is important to consider two features (1) the remoteness of the topic and vehicle, which means the semantic distance between the two concepts and (2) the appropriateness of the vehicle, which refers to it having certain attributional relations that can be mapped onto the topic. If the semantic distance is minimal, the metaphoric nature of the expression diminishes (as in the metaphor, *College is a library*), as Poincaré (1913) carefully stated, combinations that are “most fertile will often be those formed of elements drawn from domains which are far apart” (p. 386). Yet even if the semantic distance is great, if the relations are minimal (as in the metaphor, *College is a spoon*), the chances of finding it comprehensible, and

thus apt, are greatly reduced. In consequence, the inability to recover meaning from the metaphor also causes one to find it less pleasing. So a creative metaphor is also aesthetically pleasant, which refers to the overall emotional response to the linguistic stimulus. Is it interesting? Is it surprising? Therefore the relations between the two concepts that form a creative metaphor are (1) appropriate; (2) remote; and (3) aesthetically pleasing.

In short *creative metaphoric competence* is part of the conceptual system that “encompasses recognition, categorization, and analogy-making, and its central feature is the fluid application of one’s existing concepts to new situations” (Mitchell, 1993, p. 3). Now that I have developed a framework that outlines the key facets of *creative metaphoric competence*, it is now important to consider actual tasks that could be used to measure this ability.

### Developing Tasks to Assess Creative Metaphoric Competence

Designing tasks to measure metaphoric competence is similar to a typical vocabulary test with the goal of confining and constraining the subject to respond with the appropriate and norm-fitting responses. These responses likely have a correct answer and therefore are measuring the subjects’ linguistic knowledge of so-called “dead metaphors” or common idiomatic expressions that fill everyday language. They might also involve more logical or deductive thinking like solving a puzzle or unraveling a riddle. For example, in a study (experiments 2 and 3) by Chiappe and Chiappe (2007), they presented their subjects with a fill-in-the-blank metaphor task that was comprised of 24 figurative statements along with a property description attributed to the topic (e.g., “Some lectures

are \_\_\_\_\_”; Property: Boring and put you to sleep). The experiment was to assess metaphor generation, but in a conventional sense for the property description really guided the subjects (providing a clue or a hint) and suppressed the multitude of possible responses (i.e., the creative ones). They also instructed the participants to answer, “I don’t know” if they could not think of a vehicle to complete the metaphor.

In order to look more specifically at the creative production of metaphors, I developed a set of tasks using an open-ended response format, which did not prompt the participants to respond with a single correct answer and therefore multiple responses by the participants were possible for each given task. In the following paragraphs, I review past literature that aimed to measure the creative side of metaphor production with the goal of generating a framework in how to best design the set of creative metaphor production tasks for my main study.

One of the more common ways in the literature to assess metaphoric competence (in an open-ended way) is to use a task that requires the participants to complete a sentence or story that primes them to use some sort of metaphor in order to do this. These types of tasks aim to measure novel metaphor production in the participants and therefore they are a good possibility for my research in order to measure *creative metaphor competence* at the individual level. For instance in an early study, Gardner et al. (1975) devised eighteen very short stories that asked the subjects (4 to 19 year olds in an L1) to complete the ending to the story. Each story was designed according to three different models; (1) a simple declarative sentence (e.g., “*He looks as gigantic as....*”); (2) providing additional context to that declarative sentence (e.g., “*We’re glad to have you at*

*this party for our son. Look at that boy standing over there. He looks as gigantic as...*"); (3) and providing additional context to that declarative sentence that primes the subjects to use a metaphor (e.g. "*Things don't have to be huge in size to look that way. Look at that boy standing over there. He looks as gigantic as...*") (see p.127-28). Each story featured a different simile topic that consisted of an adjective (e.g., "gigantic" for the above story), so the participants had to come up with some responses that fit into the ad hoc category, "things that are very large". This could, in a conventional sense, include a skyscraper and less conventional sense a double-decker cone (according to Gardner et al., 1975). Others have also adapted this type of approach with L2 subjects (Littlemore, 2010; Trosborg, 1985). For instance, Littlemore (2010) devised sixteen short incomplete sentences that primed the subjects to complete them with a metaphor (e.g., "The lake was a shining ..... at the bottom of the valley").

In a slightly different approach to assessing creative metaphor production, De Barros and colleagues (2011) used a Metaphor Creation Test that consisted of nine items that prompt participants to produce novel metaphors by requiring them to provide the vehicle to a metaphorical idea (e.g., "The camel is the ..... of the desert."). Another metaphor assessment technique used a swap tactic, whereby the participants were shown a conventional expression and had to come up with other more "metaphorical" (novel) ways to express it. For instance, Benedek and colleagues (2014) presented participants with a short phrase that contained a noun and an adjective (e.g., "The lamp is *glowing*"), the participants then were asked to be creative and come up with a novel, but appropriate metaphor that conveys the same meaning as the adjective (e.g., "supernova").

In still another format designed to test novel metaphor production that is relatively more open-ended, Silvia and Beaty (2012) asked participants to respond with a metaphor to two different prompts that involved past emotional experiences. Metaphors are a common tool to express the emotions and increasing the intensity of such emotions has been shown to produce more novel than conventional metaphors (Fainsilber & Ortony, 1987). Silvia and Beaty (2012) provided the following two situational prompts to prime the subjects to feel the emotions of boredom and disgust: (1) “Think of the most boring high-school or college class that you’ve ever had. What was it like to sit through?” and (2) “Think about the most disgusting thing you ever ate or drank. What was it like to eat or drink it?”. To get the subjects started, they provided various stems that prompted figurative thinking (simile/metaphor) such as, “Being in that class was like .....” or “That class was .....” . These examples above are the numerous examples from previous studies that used some form of a linguistic prompt to encourage the participants to create a novel metaphor.

In the literature, there have been a number of different ways to try and get the subjects in the research to produce a novel metaphor. When designing a creative metaphor production task that prompts the subjects to respond with a metaphor, there are a couple of things to consider such as: deciding on the amount of contextual support to provide and selecting the grammatical feature (noun, adjective, verb) to use. It is also important to consider the metaphoricity of the topic chosen for the prompt. For example in the above task that uses “camel” as the topic, which then requires the subject to come up with the vehicle, one has to consider how open-ended is this topic? How many possible ways could a camel be linked to some other semantic field? Would the

respondents generally use the ad hoc category “things that provide transportation in a dessert” as a response (e.g., car, bus or more specifically BMW, Mercedes)? Moreover when working with adjectives as the metaphor prompt, such as “gigantic”, determining the novelty of the response can be rather precarious – what is more novel or less conventional; a skyscraper or a double-decker cone?

Since these metaphor tasks are aimed at measuring creativity, they discernably are more complicated to objectively measure than conventional metaphor tasks that aim at assessing the correct or incorrect response. In the next section, I focus on some different ways that researchers have addressed this issue, which usually entails using a group of raters to score the metaphors through the use of a criterion scale.

### 3.6 SCORING CREATIVE METAPHOR PRODUCTION

Judging the novelty or conventionality of a metaphor is obviously not an “absolute judgment”. Though in general as Pollio and Pollio (1979) mentioned “frozen figures can be defined as those non-literal instances that have become clichéd in the language [...] Novel figures, on the other hand, represent new linguistic creations developed in a given situation which the rater had never (or rarely) encountered in that context before” (p. 114). To remove the overly subjective position of the researcher and a single opinion dictating the novelty of a response, several judges are often recruited for this purpose. In the field of creativity research, Amabile (1983, 1996) developed a technique called the “Consensual Technique for Creativity Assessment” (CAT) (this will be discussed in more detail in the following chapter on creativity). This technique can also be applied to verbal

creativity, as in, judging the creativity of a metaphor. She insists that to use this technique there are three requirements for the task: first the task needs to produce a clearly observable product (in this case a creative metaphor), secondly the task needs to permit room for novelty (not restricting the subjects' response or compelling them to respond in a conventional way), and thirdly the demands of the task should not require a specialized skill that is not somewhat evenly developed among all the participants (1996, p. 41). A creative metaphor production task meets all these needs. It should be noted here that in Japan, English is a required course in junior and senior high school; so all the participants should have a somewhat uniform academic backgrounds in their experiences learning English. Amabile (1996) suggests that the most important criterion for using this technique is inter-rater reliability, which again I address in greater detail in the next chapter.

Obtaining good reliability likely results from clearly telling the judges how to score the different tasks. Previous studies have typically used a 4 or 5 category approach to score the metaphor responses. For instance, Gardner et al. (1975) scored the responses on the basis of one of the following categories: L (literal), C (conventional), A (appropriate) or I (inappropriate). Two outside judges conducted this scoring. Trosborg (1985) used a very similar method of coding, which she assigned the responses to one of the following categories: L (literal), C (conventional), N (novel), and I (inappropriate). The only difference was she swapped the term "novel" for "appropriate". She also used a fifth "unanswered" category when the participant failed to provide any response. Using a similar approach, Littlemore (2001a, 2010) organized these categories along a scale from 4 (novel metaphor), 3 (conventional), 2 (literal), and 1 (inappropriate) and the higher the

score the participant received, the greater the preference for novelty the participant had (2001a, p. 469). These examples are all straight forward and focus on the novelty dimension in the subjects' responses to a metaphor prompt. Others have extended this type of scale to include other factor like remoteness, cleverness, and novelty as part of a single holistic creative score (Beaty & Silvia, 2013). For instance, Beaty and Silvia (2013) gave each metaphor a score based on a 5-point creativity scale anchored by 1 (not at all creative) to 5 (very creative) and the raters were provided the following instructions to help in assessing them:

- **Novelty** reflects the originality of the response. Consider the following questions: Was the metaphor original? Was it merely a cliché or dead metaphor?
- **Remoteness** reflects the conceptual distance of the metaphor. Consider the following question: Was the vehicle conceptually distant?
- **Cleverness** reflects the degree to which the response was surprising in some way: Was the metaphor interesting? Was the metaphor perceptive? Did the metaphor make you laugh, think more deeply or see something in new way? (adapted from Beaty & Silvia, 2013; and Silvia and Beaty, 2012)

In their study, responses that received low scores typically contained some conventional expression. For example, in a metaphor prompt that primed the participants to describe a boring class, low scores included the following: “watching paint dry” or “watching grass grow.” In contrast, those that received a higher score tended to be more clever and less conventional such as, “Trying to stay awake during that class was like trying not to get seconds at an all-you-can-eat buffet” (Silvia & Beaty, 2012). So in summary, using a CAT to assess the creativity of the creative metaphor responses is a viable method of scoring and has been used in a number of previous studies in the fields of applied

linguistics and psychology. The major concern is determining the criteria for the range of scores and finding and selecting the group evaluators to assist in this process.

### 3.7 SUMMARY OF CHAPTER 3

In the first part of this chapter, I reviewed three influential theories in metaphor research and recent studies of metaphor and the brain and used these theories to develop a way to distinguish and lay out metaphor along a continuum from the highly conventional to the creative. This allowed me to analyze *creative metaphoric competence* as a distinct cognitive ability, separate from the ability to produce and comprehend common and familiar metaphors in language.

In the second part of this chapter, I then provided the literature background to previous research that aimed to measure metaphoric competence. I discussed various methods to measure this construct in productive tasks from using nominal metaphors that ask the participants to fill in the vehicle to more context dependent tasks that require the participants to complete a sentence. I also examined different ways to score the responses to these tasks. Since these novel metaphor production tasks are creative in nature, the scoring techniques may overlap with those found in the creativity research that will be addressed in the next chapter. These often rely on using a group of judges to assess the product. The main issue here is designing a clear and easy to follow criterion for these judges to use with the aim of getting high reliability in the scores between the judges.

Metaphor or figurative language more broadly is often considered a key part of everyday creativity (Carter, 2004). One question this study poses is the following: could

such creative metaphor tasks provide researchers a more valid and reliable method to measure verbal creativity than some of the more popular tests commonly used like the divergent thinking (Torrance, 2008) or remote association tests (Mednick, 1968)? In the next chapter, I look in depth at this individual difference, creativity, which as a construct has dramatically changed in perception through history. Runco and Albert (2010) discuss how creativity in the earlier pre-Christian age was associated with madness and frenzied inspiration that actually reappeared during the Romanticism period of the 19<sup>th</sup> century. In fact, originality, which is an essential part of our contemporary concept of creativity, was not an early attribute of it (Runco, 1988), but rather creativity could be seen in the effort to match or mimic ideal forms (Runco & Albert, 2010). It was not until the mid 19<sup>th</sup> century when the classical themes such as a beauty in creativity were replaced with novelty, as the criterion of creative worth (Dudek, 1999). More recently educators, business leaders, and other figures in society have called for the need to enhance creativity within the educational system (see European Commission, 2008; Tan, 2000). Therefore this study aims to further enhance our understanding of verbal creativity and the creative process of combining distantly related concepts together. It also aims to shed some light on how this could be an individual difference that relates to one's disposition or proneness to seek out the novel and unique. This ability is an important characteristic for creativity.

In the next chapter I provide a brief background on research into creativity and then look at creativity from a multifaceted perspective that includes the creative product, person, process, and past creative achievements. The goal here is to address how *creative metaphoric competence* relates to these other dimensions of creativity.

## **Chapter 4 Approaching Creativity Using a Multifaceted Approach**

In the previous chapter it was argued that *creative metaphoric competence* is an individual difference and this difference should appear in both the L1 and L2. As Blasko and Kazmerski (2006, p. 267) state “researchers often make the simplifying assumption in cognitive science that adults without obvious dysfunction are basically alike, this assumption is likely to fail in the domain of figurative language”. Therefore the first aim of this study was to investigate this difference by looking at a set of creative metaphor tasks in two different languages.

The second aim of this thesis was to explore how metaphors are “an everyday example of creative cognition in action,” (Glucksberg et al., 1997, p. 327) and I investigated the relationships between this competence to produce and interpret creative metaphors in an L1 and L2 and creativity, as a multifaceted construct. A few studies have analyzed the relationship between an individual difference like analogical reasoning or fluid intelligence and various metaphor tasks. For instance, Trick and Katz (1986) found a relationship between individuals that scored high on an analogical reasoning test and the appreciation and understanding of metaphors from highly dissimilar domains. Using another individual difference, Blasko (1999) looked at the role of higher working memory and found those with this ability produced richer interpretations of metaphors and suggest, “individual differences play a role in metaphor comprehension and interpretation” (p. 1681). Chiappe and Chiappe (2007) also found that subjects who scored higher on a working memory task produced better metaphor interpretations (scored on a 3-point scale by two raters). Others have investigated how fluid intelligence

contributes to creative metaphor quality (Silvia & Beaty, 2012). In another study by Beaty and Silvia (2013), using several factors that measure intelligence, it was shown that creative metaphors draw on a different set of cognitive abilities, namely those that rely on executive processes, as compared to conventional metaphors, which mainly draw from acquired vocabulary knowledge. What this suggests, as the above quote mentions, individual differences have an influence on metaphor production and interpretation tasks. As far as I know, research that directly looks at the relationship between creativity and the ability to produce and interpret novel metaphors has not been researched and this study aims to fill this gap.

Creativity, like metaphor is another concept that carries with it a heavy weight of historical and contentious meaning. Since the 1950s, after Guilford (1950) famously addressed the American Psychological Association and urged the need for more research that aims to explore creativity, research in the field has flourished and grown profusely. However at the same time, there have been many challenges and obstacles to this advancement, most notably, the fragmentariness of the field (Hennessey & Amabile, 2010).

The extensive literature on creativity sheds light on the perceived importance that it has for society, work, and education, but also provides a window into the complexity of this construct. This complexity has led some to analyze creativity from differing perspectives, often using some contraction or abbreviation like the “4 P’s” (*person, place,*

*process, press*<sup>4</sup>) (Rhodes, 1961), which has been extended to include two more, *potential* and *persuasion*, so it is now the “6 P’s” (see Runco, 2003, 2007; Simonton, 1990). While Glăveanu (2013) more recently has attempted to rewrite these P’s based on a contextual and dynamic approach to creativity with five A’s (*actor, action, artifact, audience, affordances*). While others distinguish between little-c (everyday) and Big-c (eminent) creativity, which also has more recently been expanded to a four C model, including the likes of a mini-c and a Pro-c (professional expertise) (Kaufman & Beghetto, 2009). The intent of this thesis was not to go into detail about the fragmentary nature of this field, but rather to look at a constructive way to approach creativity, as an individual difference, in order to develop instruments to measure it.

To begin talking about creativity, it is important to first provide a definition of this term and then look at different ways to approach it. A contemporary and widely agreed upon definition of creativity assumes that it has to have the feature of novelty and innovativeness and at the same time being of some use or being appropriate within some context. Plucker and colleagues (2004) provide a concise and discerning definition for this term as follows:

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 (p. 90).

So creativity can operate both at an individual or group level, but for the purposes of this research, I limited my approach to only the individual level. It requires some perceptible

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<sup>4</sup> Press here is probably a poor choice for it refers more to society and the evaluators or judges who decide and deem something as creative

product; this very broadly means something tangible like a sketch, a collage or a poem and so on or something more abstract like an idea. Finally this creative product also needs to be deemed within a social context as having both novelty and usefulness. Novelty refers to newness and originality or “have a certain stated uncommonness in the particular group being studied” (Barron, 1955, p. 478). The idea of usefulness is typically judged by a group of individuals at a specific point in time to which they evaluate the product as being satisfying, acceptable, and appropriate (Amabile, 1996; Stein, 1953). This approach views creativity as something that can be recognized, observed, appreciated, and often agreed upon independently by a group of people (Amabile, 1996; Barron, 1965). Therefore in this study, creativity is defined as the use of the imagination to produce something that is original and novel, but still meaningful. In addition, creativity should elicit high levels of satisfaction from the interpreters due to it being “optimally innovative” (Giora, 2003) whereby one is able to recover meaning, or familiarity, within the novelty.

The idea that one can actually measure creativity has often been clouded with doubt and suspicion for creativity has been viewed as the “disordering of all the senses”<sup>5</sup> or considered the “impenetrable aspect of human existence” (Rothernberg & Hausman, 1976, p. 3) and carries with it a myth that it is something immeasurable (Khatena, 1982). Creativity like a novel metaphor harnesses the idea of “surprise” through seeing something in a new light, through creating connections between seemingly disparate things and “upsetting expectations” (Anderson, 1964). Yet at the same time, it is now

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<sup>5</sup> Arthur Rimbaud

considered a construct that can be measured. For it appears that most agree that creativity is likely not a unitary construct, but rather made up of multiple components (Amabile, 1996; Batey & Furnham, 2006), so it is best to approach it in a multifaceted way. In this regard it is best to use “*multiple tests of the different criteria of creativity*” in order to “try and capture its many nuances” (Furnham, Batey, Anand, & Manfield, 2008, p. 1061 *italics in the original*). Using multiple criteria provides a more comprehensive assessment of the multifaceted nature of creativity (Wolfradt & Pretz, 2001). To provide background on why I chose the specific tasks I used to measure creativity in this thesis and how I developed them, I first provide a review in this chapter of how creativity has been operationalized in the past. Typically this has involved conducting divergent thinking tasks; exploring the creative person; observing past creative achievements; analyzing self-ratings of one’s creativity; and actually creating some tangible product, which then is scored by a group of independent evaluators for creativity. I cover each one of these in the following sections.

#### 4.1 DIVERGENT THINKING AND THE MULTIPLE USES OF A BRICK

Divergent thinking (hereinafter DT) is part of the psychometric tradition of studying creativity. Guilford (1968) viewed creative people as having skills that are different than those exhibited in a typical IQ test. One of the aims of the psychometric approach is to provide discriminant validity or to show that creativity is distinct from other competencies like IQ. It is generally believed that there is a threshold in regards to general ability, which suggests that below a certain level, IQ is strongly related to creativity, but above that level the two indices are completely independent (Kozbelt,

Beghetto, & Runco, 2010; Runco & Albert, 1986). IQ tests typically require the individual to respond to a set of questions that require convergent thinking for it requires one to provide the conventional or correct answer. In contrast, creativity is believed to rely more on DT, or the ability to produce a number of ideas to which some may be novel and unconventional. Although it should be noted that creativity also requires convergent thinking and in fact, it is the combination of the two – divergent thinking produces the novel ideas, but it is convergent thinking that evaluates the usefulness and appropriateness of these novel ideas (Cropley, 2006).

Nonetheless a number of DT tests have been developed with the aim of measuring creativity such as Guilford's Structure of the Intellect (SOI) DT production test, Wallach and Kogan's (1965) Creativity Test (WKCT) and Getzels and Jackson's (1962) Creativity Tests (GJCT). Yet it was Torrance's (1966, 1990b, 2008) Test of Creative Thinking (TTCT) that became the standard and benchmark way to measure creativity by way of DT tasks. This test has achieved wide recognition and international and cross-cultural use (Ferrando, Ferrándiz, Bermejo, Sánchez, Parra, & Prieto, 2007; Kim, 2006; Saeki, Fan, & Dusen, 2001). However with the popularity and wide use of this single form of assessing creativity, the TTCT and DT ended up often being conflated with creativity, which has caused DT to lose much of its appeal and to be strongly criticized. It is important to note that DT simply "estimates the potential for creative problem solving" (Runco, 1999, p. 403) and should not be considered to be synonymous with creativity (Runco, 2008), but rather a crucial step in the creative process.

#### 4.1.1 WHAT IS DIVERGENT THINKING?

DT abilities refer to having high levels of (1) *ideational fluency*, or the ability to come up with many ideas to a problem; (2) *novelty*, or the ability to come up with many unique and original ideas; and (3) *flexibility*, or the ability to produce many types of ideas.

Divergent thinking tests “require individuals to produce several responses to a specific prompt, in sharp contrast to most standardized tests of achievement or ability that require one correct answer” (Plucker & Renzulli, 1999, p. 38). DT tasks require the individual to cognitively be lead in multiple directions in order to produce various responses to an open-ended question or ill-defined problem (Runco, 1999). For instance, one of the most popular DT tasks is the “*unusual uses*” task, which asks participants to find creative uses for an everyday object like a plastic bottle (e.g., bowling pin, cut to make a flower pot, watering can, a toy for a child, put many together and make a floating device, etc.).

Typically DT tests rely on both images and language, referred to as figural and verbal activities of the test. For instance, the “*unusual uses*” task is a verbal activity. The TTCT likewise has a Verbal form, which is comprised of seven activities, and a Figural form, comprised of three activities. Table 4.1 provides an outline of these activities.

TABLE 4.1: TTCT TEST ACTIVITIES (THIS TABLE IS DEVELOPED FROM KAUFMAN, PLUCKER, & BAER, 2008 P. 26-27)

Verbal Form – Ask-and-Guess Section Activities	Description
1. <i>Asking</i>	The participant views a picture and then asks as many questions as possible about it.
2. <i>Guessing Causes</i>	The participant views a picture and then lists possible causes that led to the action shown in the picture.
3. <i>Guessing Consequences</i>	The participant views a picture and then lists possible consequences resulting from the action shown in the picture.

## Verbal Form – Self-contained Section Activities

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- |   |  |
|---|--|
| 4. <i>Product Improvement</i>                                   | The participant lists possible ways to creatively improve a product (e.g. a stuffed animal)  |
| 5. <i>Unusual Uses</i>  | The participant is asked to list unusual and alternative uses for a common everyday object (e.g. cardboard box).                                 |
| 6. <i>Unusual Questions</i><br>(Has been removed from the test) | The participant views an ordinary object (e.g. cardboard box) and then lists as many questions as possible about it.                             |
| 7. <i>Just Suppose</i>  | The participant is asked to “just suppose” an improbably situation and then list things that would happen (e.g. humans could breathe underwater) |

## Figural Form

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- |                                |  |
|--------------------------------|--|
| 1. <i>Picture Construction</i> | The participant is given basic shapes and asked to expand on it to create a picture.   |
| 2. <i>Picture Completion</i>   | The participant is provided an incomplete picture and is asked to complete it and provide a title.   |
| 3. <i>Lines / Circles</i>      | The participant is asked to modify and create as many pictures as possible from a different series of lines (form A) and circles (form B). |
- 

Obviously the figural and verbal tests use different modalities (imagery and written language), they are also viewed as measuring different DT abilities for there is little correlation ( $r = 0.06$ ) between the two tests (Torrance, 1990a as cited in Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005 p. 284). When dealing with convergent thinking tests, or more traditional IQ tests, scoring is more straightforward for there are right and wrong answers, while looking at the above examples such as the “*unusual uses*” verbal task and “*lines / circles*” figural task, scoring seems a lot more equivocal. In the following subsection, I explore some ways to assess such tasks in more detail.

### 4.1.2 MEASURING DIVERGENT THINKING

DT typically focuses on four scoring criteria: *fluency* (the number of responses); *originality* (the uniqueness of the response); *flexibility* (categorical uniqueness of the responses); and *elaboration* (the extension of ideas in the response). It should be noted

that *elaboration* is less commonly used in the literature due to its difficulty of assessment especially for untrained evaluators (Cramond et. al., 2005). Scoring DT tests can be a rather complicated and time consuming process and may actually require specific training (e.g., for the TTCT tests).

Measuring *fluency* is rather straightforward and simply requires summing the total responses to the specific task. For instance in the “*unusual uses*” task (e.g., brick), if the respondent provides seven different uses for a brick, this individual receives a score of 7 for the fluency part. As for *originality*, the assessor looks at how statistically unique the responses are and provides a score. For instance, if the participant provides a unique answer (an answer nobody else provided) – the individual receives a “1” score and for all non-unique answers a “0” (Silva et al., 2008). So this follows the simple norm, “people receive points for statistically uncommon responses, and these points are summed” (Silva et al., 2008, p. 69). Others have used a more technical approach by creating a comprehensive pool of responses, thus showing the number of respondents who gave each idea (Plucker, Runco, & Lim, 2006). Then a group of judges identify the uniqueness of the ideas by using this pooled resource. Having this resource to guide their scores, the judges’ scores for originality are very reliable (reliability coefficients ranging from 0.70 to 0.90). *Flexibility* looks at categorical variability in the responses. So again in the example of “*unusual uses*” for an everyday object like a brick, the respondent provides the following three examples: “to hit someone with”, “use as a weapon”, and “throw it at a robber” all are categorically similar, compared with “use as a paperweight” or “use it to keep your door open”. On the other hand, as for the figural (or non-verbal) tests, these often use five subscales, three of them are the same as the ones on the verbal section as

mentioned above: *fluency*, *originality*, and *elaboration*. In addition they use two more scales: *abstractedness of title* and *resistance to premature closure*.

DT tests have often been criticized for conflating creativity with DT. For instance, researchers frequently publish results that suggest they have measured creativity, but in fact, they had only used a DT task in the experiment. It is necessary to view these tests as a component to measuring creativity, but not necessarily measuring creativity itself.

Other problems with DT tests revolve around the scoring of them. Silva and colleagues (2008) outline the following three problems related to the scoring of DT tests and suggest a subjective scoring method:

- The contaminating effect that fluency has on originality scores. This confounding of fluency and originality is obvious in that any increase in the number of responses (fluency) directly will increase the chances of generating an original response. What happens then is quantity and quality become mildly distinct and in some cases undistinguishable.
- Uniqueness is not necessarily creative. On DT tests, responses are scored for originality (statistical uniqueness), but the appropriateness of these responses is not considered. This allows for bizarre and random responses to be evaluated as “unique” responses.
- Sample size and uniqueness scoring, the larger the size causes a decrease in uniqueness. In small samples, respondents naturally have a much higher chance of having a unique response, which proportionally decreases with additional participants.

A subjective scoring method could eliminate these problems, especially one that uses a consensual assessment technique (which is discussed in more detail in 4.4 of this chapter). For instance, when using judges to assess creativity, the uniqueness of the

response has to be considered in relation to its usefulness or appropriateness. The main difference between these two scoring methods is that traditional DT scoring relies more on a quantifiable objective score (regardless of the response being creative or meaningful) and the subjective scoring method relies on an agreed upon common view held by a group of judges who determine the creativity of the responses. I go into more detail in the next subsection about some of the empirical support for DT tests, but also some of the limitations in using them.

#### 4.1.3 DIVERGENT THINKING TASKS: AN EFFECTIVE, BUT INCOMPLETE LOOK AT THE CREATIVE PROCESS

Instruments to measure DT have survived in various formats for over 40 years and over this time have enjoyed a substantial amount of success. For instance, Plucker (1999) found positive correlations between TTCT and adult creative achievement ( $r = 0.60$ ), which is much higher than those found between IQ and creative achievement ( $r = 0.19$ ), which provides some evidence of discriminant validity. In another recent study using Brazilian subjects, though definitely not as strong as correlations as those found in the Plucker's study, Wechsler (2006) found a significant relationship between figural and verbal indicators using a DT test with creative achievement. Other studies have also substantiated the validity of DT tests by looking at the relationship of the DT scores and scores based on real-life problem solving issues. For instance, Davidovitch and Milgram's (2006) found a strong correlation ( $r = 0.64$ ,  $p < 0.0001$ ) between DT scores and teacher effectiveness. This latter construct was measured with a 5-item instrument that described problems in education and for the participants to generate as many possible solutions to them. Yet this instrument, itself, appears to be a type of DT test, which

requires ideation and the ability to come up with multiple solutions to a problem. In contrast, a so-called “real world” example of teacher effectiveness could have been used in this study such as using a student questionnaire or peer assessment. These forms of data collection more likely represent teacher effectiveness over time, in multiple contexts, and one that has been socially determined than coming up with possible solutions to a problem.

Despite these positive correlations and successful research projects that have used DT tests as the main instrument, there is still much controversy about the usefulness of them in being able to predict real-world creativity (Sawyer, 2006; Zeng et al., 2011). DT tests have fallen under numerous attacks that often show the limitations of the practical value of them. For instance, Zeng and colleagues (2011) bring up an important issue of construct validity in DT tests. For as shown in this chapter, DT tests mainly score for originality and ideational fluency, but fail to address the “appropriateness” and “usefulness” part in the definition of creativity. In addition, DT tests often allude to being a good instrument for measuring the creative process, but again it falls short here, too. The creative process involves four steps: analysis, ideation, evaluation, and implementation. DT tests really only measures the ideational part (Zeng et al., 2011). Besides DT test’s overreliance on a narrow part of the creative process, others have even suggested that convergent thinking may prove to play just as large a role as divergent thinking for creativity (Basadur, Runco, & Vega, 2000; Cropley, 2006).

Nonetheless, DT tests are helpful in providing insight into part of the creative process (ideational fluency and originality of thought) and creative potential of the

individual. In this study, I developed two figural tasks from previous DT tests that aimed to measure the non-verbal side of ideational thought. I did not include any verbal DT tasks mainly because the participants already had to complete a large number of verbal tasks, in the way of the metaphor instruments developed in this study. As previously stated, when seeking to measure the multidimensional nature of creativity, it is important not only to rely on DT tests, but to use several instruments such as past creative achievements, personality, and creative production (Cropley, 2000; Furnham, Batey, Anand, & Manfield, 2008; Kim, 2006).

#### 4.2 PAST CREATIVE ACHIEVEMENT AND EVERYDAY CREATIVITY

One way to measure the variance of creativity among individuals is to develop a creative achievement inventory. Such an instrument asks participants to reflect on and indicate past achievements in varying domains of experience, so these are often considered biographical self-reports that typically follow a questionnaire format. There is some evidence that supports this idea that creative people are aware of their own creativity (Barron & Harrington, 1981). Carson, Peterson, and Higgins (2005) developed a self-rating inventory called The Creativity Achievement Questionnaire (CAQ) and categorized such creative activities into 10 differing domains that then could be divided into two distinct dimensions: “Arts” and “Sciences”. For instance in the “Arts” dimension there are such domains as drama, writing, humor, music, visual arts, and dance. There are 8 items within each domain that are weighed from “0” to “7” based on the level of creativity for each item (e.g., “I play one or more musical instruments proficiently” is “1” while “Recordings of my composition have been sold publicly” is “6” and “0” applies to

those who have no talent in this domain). One issue with the CAQ is that many of the items on it do not seem to be highly applicable for university students, but rather for older, more experienced and influential creative people or measuring what is known as “Big C”. For this study, I am mostly interested in little-c creativity, or everyday creativity, viewing it as a normally distributed cognitive trait that everyone has to some degree (Finke, Ward, & Smith, 1992). In addition, as Richards (2010) suggests “Everyday creativity can be seen as the ground from which (a later and) more publicly celebrated accomplishment can grow” (p. 193).

Other researchers have also tried to go beyond the “arts” and “sciences” dual focus dimensions of creativity and include more of this “everyday creativity” by including other items like “interaction”, which addresses such topics as teaching, playing with kids, leadership, and handling money issues (Kaufman, Cole, & Baer, 2009; Kaufman, Waterstreet, Ailabouni, Whitcomb, Roe, & Riggs, 2009). Hocevar (1980), who was actually one of the first to develop such an inventory to measure this everyday creativity, developed what he called the “Creativity Behavior Inventory” (CBI). This approach to assessing creativity relies on the belief that “past behavior is generally the best predictor of future behavior” (Hocevar, 1981, p. 459). Dollinger (2003) later further developed this original inventory. More recently, Batey (2007) developed his own more compact version called “The Biographical Inventory of Creative Behaviors” (BICB), which is made up of 34 items. The items on this inventory seem more applicable to the participants in this thesis. For instance, the participants are simply asked to put an “X” in the corresponding box if he/she has been involved in such an activity in the past 12 months, which results in a simple binary 0/1 score for each item. Some examples of these

activities are; “Drawn a cartoon”, “Made someone a present”, and “Delivered a speech”, but the inventory also includes social creativity like leadership and mentoring. The BICB has been used in a number of recent studies providing empirical support for reliability and validity (Batey & Furnham, 2008; Batey, Furnham, & Safiullina, 2010; Furnham, Batey, Anand, & Manfield, 2008; Silvia, Nusbaum, Berg, Martin, & O’Connor, 2009). Table 4.2 provides a more detailed look at some of these studies.

TABLE 4.2: RELIABILITY AND VALIDITY OF THE BICB

Study Using the BICB	Reliability <sup>a</sup>	Validity (Correlation to creativity)
Furnham, Batey, Anand, and Manfield, 2008	0.74	Divergent Thinking Fluency (r = .33**) Openness to Experience <sup>6</sup> (r = .38**) Extraversion (r = .34**)
Batey and Furnham, 2008)	0.78	Creative Personality Scale <sup>7</sup> (r = .34**)
Batey, Furnham, and Safiullina, 2010	0.78	Divergent Thinking Fluency (r = 0.21*) Openness to Experience (r = 0.33**)

<sup>a</sup> Measured using Cronbach’s alpha

r = Pearsons inter-correlations between BICB and various measures of creativity

\*\* Significant to  $p < 0.01$

\* Significant to  $p < 0.05$

Silva and colleagues (2012) also in their assessment of creativity with self-report scales found that the BICB had a solid factor structure and internal consistency. Using such a questionnaire follows the belief that past creative behavior is predictive of future creative behavior and thus is commonly used in creativity research. In this study, adapting a number of items from the before mentioned biographical self-reports, I developed a

<sup>6</sup> Openness to Experience and Extraversion are personality traits part of the Five Factor Model of personality. Openness is an especially common marker of a creative personality. I will discuss this more in the next section of this chapter.

<sup>7</sup> This was measured by using a famous though slightly outdated measure of the creative personality that uses a creative adjective check list where participants check adjectives they believe apply to their personality (Gough, 1979).

Japanese version of a Past Creative Achievement Questionnaire. I describe this form in greater depth in the following chapter.

The next section moves from past creative achievements to the creative person and addresses the strong relationship between the personality trait, openness to experiences, and various creativity measures.

### 4.3 PERSONALITY TRAITS AND CREATIVITY

Personality is something that distinguishes differences between people and refers to the relatively enduring and consistent set of behaviors, feelings, and thoughts that characterize an individual (Feist & Feist, 2009). Personality descriptions use trait words as the natural units to describe an individual's personality and were first introduced by Allport (1937) and later developed by Cattell (1965, 1979) and Eysenck (1970). The discovery and development of research into personality traits materialized from the *lexical hypothesis*, which proposes that all the important personality traits appear within the lexical units of the different natural languages in the world. Allport and Odbert (1936) used Webster's dictionary and browsed through the pages looking for words that described people and found nearly 18,000 words and roughly 4,500 of them actually described people's personalities. Grouping these words together by synonyms and using semantic reduction steps, Cattell (1943) was able to organize these thousands of words into a more manageable set of variables to describe individual differences. Most of these clusters of personality traits were bipolar or consisted of two extremes and by the end he had 171 clusters that were condensed into 35 trait variables (e.g., Rigid – Adaptable

Silent, introspective – Talkative) (Cattell, 1947). Through the use of factor analytic studies of peer ratings of college students, he concluded, “the greater part of variance in the personality sphere can be accounted for by about 12 factors” (Cattell, 1947, p. 217). Eventually Cattell et al. (1970, 1993) developed an assessment with 16 primary factors and 5 global factors, which resulted in what is known as *The Sixteen Personality Factor Questionnaire - 16PF*. The following are the 16 factors: warmth, reasoning, emotional stability, dominance, liveliness, rule – consciousness, social boldness, sensitivity, vigilance, abstractedness, privateness, apprehension, openness to change, self-reliance, perfectionism, and tension. Below are the five global factors accompanied by the 16 personality factors that correlate with them either positively (+) or negatively (-):

- *Extraversion* (warmth +, liveliness +, social boldness +, privateness –, self-reliance –)
- *Anxiety* (emotional stability –, vigilance +, apprehension +, tension +)
- *Self-Control* (liveliness –, rule-consciousness +, abstractedness –, perfectionism +)
- *Independence* (dominance +, social boldness +, vigilance +, openness to change +)
- *Tough-Mindedness* (warmth –, sensitivity –, abstractedness –, openness to change +)

Yet many questioned the complexity of Cattell’s model, as Tupes and Christal (1961) found “five relatively strong and recurrent factors and nothing more of any consequence” (p. 245) and soon the number five and a five-factor model began to appear in a number of studies (Norman, 1963; Borgatta, 1964). Tupes and Christal subsequently labeled these five recurrent factors as: (a) Surgency, (b) Agreeableness, (c) Dependability, (d) Emotional Stability, and (e) Culture. The expansion and evolution of this five-factor model continued over the next couple decades. Despite the fact that most researchers agreed upon the number five, the names given to label them continued to be

disputed, especially in regards to the last factor (e) Culture. The first factor typically began to be called *Extraversion*, which was likely taken from Eysenck's model that took a narrower approach to personality and proposed three superfactors consisting of: Neuroticism (stability/instability), Extraversion (introversion), and Psychoticism (aggressiveness) (Eysenck & Eysenck, 1985). The second factor also sometimes called "likeability" (Borgatta, 1964), but *Agreeableness* remained the most common label. The third label nowadays is often called *Conscientiousness* (Norman, 1963; Costa & McCrae, 1985). The fourth label is often referred to with the bipolar label of Emotional Stability – *Neuroticism*. Finally the fifth label has been variously interpreted and called Intellect (Digman & Inouye, 1986; Goldberg, 1981); Intelligence (Borgatta, 1964) and finally *Openness* (Costa & McCrae, 1985). It is this final one that appears to have been the most widely accepted label and will be used in this thesis. In the 1980s and 90s Costa and McCrae (1985, 1992) used this five-factor model and designed a personality inventory called the NEO Personality Inventory (NEO-PI) and an ensuing revised version (NEO-PI-R). This model is often appropriately labeled the *Big Five* (Goldberg, 1990).

As a note, many of the personality inventories are proprietary instruments and thus restrictive for use in research. A public-domain website called the International Personality Item Pool (IPIP) provides online access to personality inventories that have been developed, refined and maintained by researchers and is in the public domain, so accessible and continually being updated (see Goldberg et al., 2006 or <http://ipip.ori.org> for more information).

#### 4.3.1 PERSONALITY: THE BIG FIVE

The Five-Factor Model (FFM) contends that from all the different ways to describe personality in ordinary language there are five dimensions that integrate these traits together (Costa & McCrae, 1992; McCrae & Costa, 1997). This means that by way of factor analysis, five factors emerge from a variety of personality tests that aim to measure various personality constructs. The Revised NEO Personality Inventory (Costa & McCrae, 1992) is one of the most widely used inventories for the FFM and consists of the following personality factors:

- (O) Openness to Experience (curiosity, unconventionality versus a preference for the familiar)
- (C) Conscientiousness (orderliness, discipline versus sloppiness, laziness, and unreliability)
- (E) Extraversion (talkativeness, outgoingness versus shyness, quietness, and passivity)
- (A) Agreeableness (kindness and gentleness versus rudeness and harshness)
- (N) Neuroticism (moodiness, anxiety, and touchiness versus relaxedness)

Each factor is based on the sum of responses on six subscales sometimes called facets.

For example, the facets for Openness are the following:

- *Fantasy* (vivid imagination)
- *Aesthetics* (interest and appreciation for art, poetry, music and beauty)
- *Ideas* (intellectual curiosity)
- *Actions* (willingness to try new things and a preference for novelty and variety over familiarity)
- *Feelings* (awareness and valuing of one's emotions)
- *Values* (questioning conventional norms and open to unconventional principles)

(Costa & McCrae, 1992; McCrae & Costa, 1997)

The power of using measures of personality in research is that they often have predictability for real world outcomes (Ozer & Benet-Martinez, 2006). For example, *Conscientiousness* has been shown to be a significant predictor of academic success (Goff & Ackerman, 1992) and moderately predicts job related performance (Judge, Jackson, Shaw, Scott, & Rich, 2007). In contrast, *Neuroticism* has been shown to negatively affect performance on a math task (Schneider, 2004) and susceptibility to various mental disorders like depression and anxiety disorder (Hettema, Prescott, & Kendler, 2004). In regards to creativity, which is the main theme of this study, *Openness to Experience* deserves the most attention. This trait has consistently been shown to be positively related to creative potential (see Batey & Furnham, 2006). Individuals who score high on this trait have a proclivity to seek out new experiences and possess a curiosity and desire to explore the unfamiliar and a willingness to engage in the new, so discernibly a key personality trait for creativity. In the following part I look in more detail at various studies that have provided empirical evidence for this relationship between openness and creativity.

### Openness and Creativity

Creativity is a latent trait that relies on the combination of numerous variables like the social, the cognitive, and personality. In regards to personality, *Openness to Experience* is a crucial trait for creativity and can predict creativity using a wide range of measurements. Table 4.3 lists a number of studies that have found positive correlations between this personality trait and a number of instruments used to measure the many difference facets of creativity.

TABLE 4.3: THE RELATIONSHIP BETWEEN OPENNESS TO EXPERIENCE AND VARIOUS CREATIVITY INSTRUMENTS

Study	Strength of relationship	Creativity instrument
McCrae (1987)	$r = 0.37$ $p < 0.01$ (Younger group of men)	Divergent Thinking Test
	$r = 0.42$ $p < 0.01$ (Older group of men)	
King, Walker, and Broyles (1996)	$r = 0.38$ $p < 0.01$	TTCT (Torrance, 1990b) - verbal section of the test
	$r = 0.47$ $p < 0.01$	Creative Accomplishments (i.e., a list of accomplishments in visual arts, performance activities, writing, etc.)
Chamorro Premuzic and Reichenbacher (2008)	$r = 0.55$ $p < 0.01$ (Stress inducing by threat of evaluation)	Divergent Thinking Test (verbal fluency and creative problem solving)
	$r = 0.53$ $p < 0.01$ (Calm inducing by no evaluation)	
Wolfradt and Pretz (2001)	$\beta = 0.19$ , $p < 0.05$	Creative writing task about a picture (consensually assessed by 2 blind raters on a 5-point scale)
	$\beta = 0.22$ , $p < 0.05$	Creative hobby scale from high (e.g., painting, playing an instrument) to low (e.g., watching TV, reading)
Furnham, Zhang, and Chamorro-Premuzic (2005)	$r = 0.31$ , $p < 0.01$ $\beta = 0.32$ , $p < 0.01$	The Barron-Welsh Art Scale (Barron & Welsh, 1952) as a measure of creativity
Silva et al. (2009)	$r = 0.63$ , $p < 0.05$	Creative Behavior Inventory (Dollinger, 2007)
	$r = 0.66$ , $p = .05$	Global creativity
Hughes, Furnham, and Batey (2013)	$\beta = 0.56$ , $p < 0.01$	Self-estimated Creativity

$r$  = measures the correlation between two variables

$\beta$  = standardized regression coefficient and measures how strongly the predictor variable (i.e., openness to experience) influences the criterion variable (i.e., scores on the creative writing task)

The consensus in all of these studies is that *Openness* can perhaps be conceptualized as a proxy measure of creativity (Chamorro-Premuzic, 2007). The close and consistent relationship *Openness* has to a wide range of creative instruments that

measure creative potential (divergent thinking), creative products (written stories) and creative achievement (self rated questionnaires of past experiences) provides substantial evidence that it is a valid tool to measure the creative personality. As some creative measurements like the divergent thinking tasks might point towards an individual's creative potential, openness to experience is really the catalyst that leads to creative explorations (McCrae, 1987).

### Big 5: Across Languages and Cultures

McCrae & Costa (1999) claim that these five traits are endogenous traits that have biological origins and thus universally shared. In addition, they have been researched and observed in a range of different languages and across numerous cultures (McCrae & Terracciano, 2005; Yamagata et al., 2006). So this personality model appears to be valid cross-culturally. For instance in Japan, a number of Big Five scales have been translated and validated over the past two decades under such names as the Big Five Scale (BFS) (Wada, 1996); the Big Five (Murakami & Murakami, 1999) and the NEO-PI-R (Shimonaka et al., 1998). Below are the 5 factors with the corresponding Japanese, some of the factors (similar to what occurred in English as previously mentioned) have varying names depending on the source (e.g., Conscientiousness: 勤勉性 [kinbennsei] and 誠実性 [seijitsusei]), for the sake of simplicity I use the 5 factors based on NEO-PI-R (Shimonaka et al., 1998):

- 開放性 [kaihousei] (Openness)
- 誠実性 [seijitsusei] (Conscientiousness)
- 外向性 [gaikousei] (Extroversion)

- 協調性 [kyouchousei] (Agreeableness)
- 神経症傾向 [shinkeishou keikou] (Neuroticism)

These scales are commonly used in Japan (Namikawa et al., 2012) and for this thesis I rely mostly on the NEO-PI-R items (Shomonaka et al., 1998). In this study, I developed a unique Five-Factor Model of the creative personality. I describe how I developed this in more detail in the following chapter.

#### 4.3.2 THE CREATIVE PERSONALITY: BEYOND THE BIG FIVE

In the previous section, I presented the close relationship *Openness* has to various measures of creativity, but there are also other personality traits that are equally important for creativity that are not included in the Five Factor model. In this section, I explore a number of other variables indicative to an overall creative person. This is not an exhaustive taxonomy, but still thorough and expansive and goes beyond *Openness*. The ones that I focus on here are: Self-Efficacy, Persistence, Intrinsic Motivation, Curiosity, and Tolerance of Ambiguity. In Chapter 5, I describe how I used these factors in an exploratory study from which I developed a creative personality instrument that was used in this thesis in order to measure the multifaceted nature of the creative person.

##### Self-Efficacy

The construct, *self-efficacy*, developed from the work of Bandura (1977, 1997), refers to the belief that one has the capabilities to do a certain behavior, which then in turn affects activity choice, the amount of effort exerted in doing it, and the persistence in doing it in the face of difficulties. Bandura and Locke (2003) suggest, “a resilient sense of efficacy

provides the necessary staying power in the arduous pursuit of innovation and excellence” (p. 97). From Bandura’s (1997) broad self-efficacy construct, Tierney and Farmer (2002) developed a variant construct of this and called it, creative self-efficacy. This, they refer to as “the belief one has the ability to produce creative outcomes” (Tierney & Farmer, 2002, p. 1138). Creative self-efficacy is often applied to work-related research and the judgment one holds towards having the capacity to do one’s job creatively. Empirical research shows that creative self-efficacy acts as a mediator between creative potential and creative achievement (Choi, 2004; Schack, 1989; Tierney & Farmer, 2002) and may actually be a necessary precursor of creative effort (Tierney & Farmer, 2002).

Apart from work done with creative self-efficacy in job related environments, others have also looked at it from an educational perspective. For instance, Choi’s (2004) study with undergraduate students, creative self-efficacy was positively significantly related to creative performance (as measured by instructors rating students’ classroom-based creative performances) and creative ability (as measured from a five-item self-reported assessment of creativity-relevant skills) ( $\beta = 0.34$ ,  $p = 0.001$ , and  $\beta = 0.30$ ,  $p = 0.001$ , respectively). Other studies have also found similar positive relationships such as teachers’ ratings of creative expression (i.e., expressing ideas that are novel and appropriate for the given task) in science and students’ creative self-efficacy in science ( $\beta = 0.16$ ,  $p = 0.01$ ) (Beghetto, Kaufman, & Baxter, 2011).

To measure creative self-efficacy, a variety of items have been developed and administered in different situations. Karwowski and colleagues (2013) used a scale

labeled the Short Scale of Creative Self (SSCS), which is composed of 11 items and six are used to measure creative self-efficacy such as: (3) I know I can efficiently solve even complicated problems; (4) I trust my creative abilities; (9) I am good at proposing original solutions to problems (p. 222). In another study, seeking to measure this construct with middle and secondary school students, Beghetto (2006) used the following three items: (1) I am good at coming up with new ideas, (2) I have a lot of good ideas, and (3) I have a good imagination (p. 450). In addition, Choi (2004) used a four-item measure for creative self-efficacy and provided the following two examples: (1) I feel confident that I can introduce new ideas to the class in a convincing manner and (2) I feel nervous when I present different views to classmates (reverse coded) (p.193). Lastly Beghetto and colleagues (2011) developed a very specific creative self-efficacy scale for a Science class using such items as: (1) I am good at coming up with new ideas during science class; (3) I have a lot of good ideas during science class; (4) I am good at coming up with my own science experiments (p. 8). What the literature implies from the above examples is that when developing items to measure creative self-efficacy, it is important to consider the specificity or generalizability of self-efficacy. Specific self-efficacy “operates selectively across different activity domains and under different situational demands” (Bandura, 1997, p.42), while viewed as a generalized trait consists of viewing it as “one’s overall estimate of one’s ability” (Eden & Zuk, 1995, p. 629). Self-efficacy is an important individual difference for it provides the individual with the belief that one has the potential and capabilities to engage in some creative activity. So self-efficacy can influence one’s willingness to engage in a behavior and it potentially acts as a catalyst for the generation of some creative product. The second item that I address in this section is

*persistence*, which provides the patience and endurance to overcome the various impediments that one often faces when doing something creative.

### Persistence

For Eysenck (1995), creative achievement depends on a number of factors converging together such as: cognitive abilities, which involves having knowledge and technical skills; environmental variables, which may include education and the socio-economic environment; and personality traits like motivation, confidence, originality, and *persistence* (p.38). It is persistence that sustains one's involvement in the activity, prevents premature closure when confronted by an obstacle or hardship, and maintains the intensity and effort in order to reach some directed goal. In fact, persistence is one of the key observable features of any goal-directed behavior (Gollwitzer, Parks-Stamm, Jaudas, & Sheeran, 2008). In studies that consisted of interviewing highly creative people, the researchers found that perseverance was a consistent personality trait of these individuals (Adelson, 2003; Csikszentmihalyi, 1996).

This willingness to expend effort is characteristic of the creative individual (Cropley, 1997, p. 236) and this drive and exertion, even in the face of difficulty, is essential for creative discovery. This perseverance in childhood is more predictive of success than IQ or domain specific ability (Winner, 1996, p. 293). This word, persistence, though has many faces like grit (Duckworth et al., 2007), tenacity, and *ganbaru*. *Ganbaru* (a Japanese word 頑張る), which literally means “work hard”, “try hard”, “make an effort” or to “persevere with something” is considered the key to successful school life in Japan, more so than being original (Taylor et al., 1997).

Nijstad and colleagues (2010) developed a dual pathway model of creativity in which they argue that creative problems solving, which results in the generation of original and appropriate ideas, proceeds through two pathways, cognitive flexibility and cognitive persistence. They describe cognitive persistence as “the degree of sustained and focused task-directed cognitive effort” (p. 42).

In order to measure such cognitive effort, Lufi & Cohen (1987) developed a 40-item true/false response scale for determining persistence in the academic field. Items on this scale include:

- I often do not complete many activities I begin. (reverse)
- I usually persist in what I am doing.
- I usually give up easily when I do not success. (reverse)
- I do not stop my work even if it is very difficult.

In their study, they provide further support for the idea that persistence is significantly correlated with internal locus of control (Lufi & Cohen, 1987; Mischel, Zeiss, & Zeiss, 1974). People tend to persist more in an activity when they feel that they are in control. On the other hand, when the control is seen as being external or controlled by others, people tend to persist less. So persistence is closely linked to *motivation* and goal directed behavior, which I discuss in the next section.

### Motivation

*Motivation* within a framework of creativity research usually focuses on distinguishing between what has become known as intrinsic and extrinsic motivation, as put forth in self-determination theory (SDT) (Deci & Ryan, 1985; Ryan & Deci, 2000). An

intrinsically motivated individual performs a task not for some outcome or reward, but simply from the satisfaction, stimulation, and sense of accomplishment from doing the activity or doing an activity for its own sake (Deci & Ryan, 1985). An extrinsically motivated individual is controlled by an incentive or reward, so the behavior is directed not out of a sense of flow (Csikszentmihalyi, 1990) and fascination with the task, but by some external force. Amabile (1983, 1996) has shown that even if individuals have traits and abilities that are conducive for creativity, without intrinsic motivation, any such creative achievement will unlikely come to fruition. On the other hand, extrinsic motivation and the expectation of an award is believed to play a detrimental role by reducing intrinsic motivation and actually undermining creativity for it makes the individual less likely to take a risk and playfully explore the task (Hennessey & Amabile, 1998; Tegano, Moran, & Sawyers, 1991). Yet this is rather contentious for a number of studies have also pointed out that extrinsic motivation (along with intrinsic motivation) has an incremental effect on creativity (Eisenberger, & Cameron, 1996; Eisenberger & Rhoades, 2001; Choi, 2004).

Nonetheless intrinsic motivation is an important facet for creativity and has a mediating effect on it by encouraging exploration and persistence of the task (Prabhu, Sutton, & Sauser, 2008). Positive correlations have been reported between intrinsic motivation and various creativity measurements like creativity self-beliefs (Prabhu et al., 2008) and a creative product (Chen et al., 2006). Amabile and colleagues (1994) developed a Work Preference Inventory to measure intrinsic and extrinsic motivation. The intrinsic motivation scale is a 15-item inventory that uses a 4-point Likert scale with a range from “never or almost never true of me” to “always or almost always true of me”.

These items seek to measure key features of intrinsic motivation such as: autonomy, competence, task absorption, curiosity, and interest (Amabile et al., 1994). Below are some sample items that appear in this inventory that look at intrinsic motivation:

- I enjoy trying to solve complex problems.
- No matter what the outcome of a project, I am satisfied if I feel I gained a new experience.

In their study (Amabile et al., 1994), they found overwhelming empirical evidence that intrinsic motivation correlated positively with creativity using a wide range of measurement to assess creativity such as several writing measures and one artistic measure. Chen and colleagues (2006) also used this above Work Preference Inventory to measure intrinsic motivation in their study. They found good internal consistency between the measures (Cronbach  $\alpha = 0.70$  for the intrinsic motivation scale, Cronbach  $\alpha = 0.77$  for the extrinsic motivation). Similarly, they found that intrinsic motivation had strong correlation ( $r = 0.37, p < .01$ ) for verbal creativity, which was measured with a story and poem writing task. In another study (Prabhu et al., 2008) that used the same inventory to measure intrinsic motivation, they also found strong correlations between intrinsic motivation and creativity ( $r = 0.39, p < 0.01$ ), as well as, Openness to Experience ( $r = 0.35, p < 0.01$ ).

Valerand and colleagues (1992) developed their own Academic Motivation Scale based on SDT. This is a 28-item instrument that measures amotivation, various forms of extrinsic motivation and intrinsic motivation. They classified three different types of intrinsic motivation as follows: *intrinsic motivation to know* (IM-K), which involves

exploration, curiosity, desire to learn, and pleasure of acquiring new knowledge (e.g., I am studying at university simply because I enjoy learning new things); *intrinsic motivation towards accomplishments* (IM-A), which involves in engaging in an activity for the pleasure and satisfaction of mastering or becoming more competent at something (e.g., I feel a sense of accomplishment when I grasp a difficult construct in a lesson); and *intrinsic motivation to experience stimulation* (IM-S), which involves engaging in experiences for the stimulation that it provides, this can include joy, pleasure, excitement, or a sense of flow (e.g., I often am absorbed in my studies and lose track of time). So this provides some structure to intrinsic motivation, as something that involves the desire to know new things; the desire to become competent and the satisfying experience derived from accomplishing something difficult and complex; and the seeking out of new and novel experiences and the heightened sense of feeling a “high” sensation in doing so. The advantage of having high intrinsic motivation is what Amabile (1996) has called the “Intrinsic Motivation Principle of Creativity” and therefore it is a key trait when assessing the creative personality. In the next section, I look at *curiosity*, which is highly related to intrinsic motivation and that thirst to know and experience the unfamiliar.

### Curiosity

*Curiosity* plays an important part in cognitive development and the overall advancement of civilization (Berlyne, 1978). Early views towards curiosity viewed it as the “appetite for knowledge” or “thirst for knowledge” (see Loewenstein, 1994) and so it is an approach-oriented, as compared to an avoidance-oriented, motivational state (Arnold, 1910) that involves a passion and desire to know. A more current view of curiosity defines it as “the recognition, pursuit, and intense desire to explore novel, challenging,

and uncertain events” (Kashidan & Silvia, 2009, p.368). Furthermore Litman and Spielberg (2003, p. 75) suggest that it is, “a desire to acquire new [information and] knowledge and new sensory experience that motivates exploratory behavior”. Berlyne (1954) suggested curiosity be viewed according to two differing dimensions, “epistemic” (knowledge), which is a “drive to know”, and “perceptual” (sensory), which is a “drive to experience and feel” (p. 187). In addition to distinguishing between, knowledge seeking and sensation seeking differences in curiosity, curiosity can also be divided between state and trait curiosity. State is the response to a particular event, stimuli, or situation that involves novelty and complexity. Trait curiosity is the more broad individual difference that differentiates the capacity individuals have in exploratory and novel seeking behavior.

There are a number of instruments that aim to measure curiosity. One of the earlier ones is called the Melbourne Curiosity Inventory (MCI; Naylor, 1981). In this instrument, there are 20 items that measure state (C-state) and 20 items that measure trait (C-trait) curiosity on a 4-point Likert scale. The state scale, since it deals with curiosity in a particular situation, needs to be administered in the context of some activity (e.g., a foreign language class). One item on the C-trait scale reads, “I am curious about things”, which is a more general capacity to experience curiosity. In contrast, the C-state scale slightly modifies the previous item and reads, “I feel curious about what is happening” referring to the current activity or situation. For the purposes of this thesis since I was looking at individual differences, I only concentrated on trait curiosity.

Litman and Spielberger (2003) developed a curiosity scale with 56 items, 40 for epistemic (EC) and 16 for perceptual curiosity (PC) (the 16 PC items were developed by Collins, 1996). Subjects respond using a 4-point Likert scale on how they “generally feel” ranging from 1 (almost never), 2 (sometimes), 3 (often), to 4 (almost always). Some of these items are as follows:

- Enjoy exploring new ideas (EC)
- Enjoy learning about subjects which are unfamiliar (EC)
- Interested in discovering how things work (EC)
- I like to listen to new and unusual kinds of music (PC)

Kashdan and colleagues (2004) developed a curiosity inventory called the Curiosity and Exploration Inventory (CEI) with two dimensions: “exploration (appetitive strivings for novelty and challenge) and absorption (full engagement in specific activities)” (p. 291). A 7-point Likert scale with descriptors from 1 (strongly disagree) to 4 (neither agree nor disagree) to 7 (strongly agree) was used in their study. An example of an “Exploration” item is as follows: “I frequently find myself looking for new opportunities to grow as a person (e.g., information, people, resources)” and an example of an “Absorption” item is: “When I am participating in an activity, I tend to get so involved that I lose track of time”.

Curiosity plays an important role in academic achievement and creativity since it involves exploring the unknown or the novel. One possibility for this is that curiosity increases activity in memory areas of the brain, as assessed by fMRI, and consequently may enhance memory (Kang et al., 2009). Later they confirmed this hypothesis in a

behavioral study that showed those who showed higher amounts of curiosity in an initial session had better recall 1 to 2 weeks later. Curiosity and effort have also been shown to have an equal impact, as intelligence, on academic performance (Stumm, Hell, & Chamorro-Premuzic, 2011). Since curiosity plays an active role in intellectual development and the desire to explore and engage with the novel, it is paramount for creativity. Curiosity is the tendency to try and make sense of the world and resolve incongruities (Loewenstein, 1994, p. 82). Novel metaphors violate expectations and are incongruous in their nature, so it could be assumed that curiosity, as an individual difference, could play a role in the exploratory behavior of producing and interpreting novel and unconventional metaphors, as well. This leads to the final construct in this section, *tolerance of ambiguity*, or the preference and attraction towards the uncertain.

### Tolerance of Ambiguity

*Tolerance of ambiguity* (AT) refers to the capacity to withstand or “tolerate” ambiguous situations that often involve novelty and contradictions and lack structure. Those who are intolerant find such situations as a source of psychological discomfort, while those who are tolerant find them desirable and interesting. Frenkel-Brunswik (1949) began research into the construct of tolerance of ambiguity as an “emotional and perceptual personality variable” and many others have continued to pursue this topic (Budner, 1962; MacDonald, 1970; Norton, 1975). Norton (1975) provides a comprehensive list of items that cause psychological discomfort for someone who is intolerant of ambiguity such as “vague, incomplete, fragmented, multiple, probable, unstructured, uncertain, inconsistent, contrary, contradictory, or unclear meanings” (p. 608). Feist (1999) in his review of dispositional characteristics of creative scientists and artists revealed that they had the

tendency for high levels of tolerance for ambiguity along with other characteristics like energy, autonomy, and openness. In fact tolerance of ambiguity consistently shows up in a wide range of studies as a trait of creative people (Barron & Harrington, 1981; Feist, 1998; Tardif & Sternberg, 1988). Situations that involve creative thinking often are ambiguous in nature for they require the individual to explore the novel, complex, contradictory or unusual stimuli (Urban, 2003; Zenasni, Besançon, & Lubart, 2008).

There have been a number of scales developed to measure tolerance of ambiguity. Budner (1962) distinguished between three types of ambiguous situations: novelty, complexity, and insolubility (p.30), which may cause various forms of behavior such as avoidance, repression and denial, or discomfort and anxiety. He developed a 16-item (8 reverse) scale for measuring tolerance-intolerance of ambiguity, which was designed to assess responses to different ambiguous situations (e.g., novelty, complexity, insolubility). Below are some items that appeared on the original scale (Budner, 1962):

- A good teacher is one who makes you wonder about your way of looking at things.
- It is more fun to tackle a complicated problem than to solve a simple one.
- I would like to live in a foreign country for a while.

Rydell-Rosen (1962) also developed a 16-item scale that was later modified into a 20-item scale (MacDonald, 1970) with items such as:

- A problem has little attraction for me if I don't think it has a solution.
- I am just a little uncomfortable with people unless I feel that I can understand their behavior.

- There is a right way and a wrong way to do almost everything.

Norton (1975) developed a more in-depth scale called the Measure of Ambiguity Tolerance (MAT-50). He lists 61 items categorically placed in 8 categories such as job-related and everyday habits. He showed the construct validity of this scale through various experiments that showed it had predicative power. For instance, those who scored high on tolerance of ambiguity tended to volunteer for undefined experiments more readily; used a different set of aesthetic judgments when evaluating a piece of art as good (“unusual” for high AT while “complete” for low AT); and tended to dramatize more in small problem solving groups (p. 616-618). Some items on this scale are as follows:

- I tend to like obscure or hidden symbolism.
- I will not consider buying an item unless the price is clearly marked on it.
- I seem to enjoy parties the most when I know most of the people there.

Tolerance of ambiguity provides one the flexibility to deal with antinomies and paradoxes, which are an essential part of creativity. A number of empirical studies have found AT to be related to a number of measurements for creativity. Merrifield and colleagues (1961), to which they describe tolerance of ambiguity as “a readiness to accept indefiniteness”, found in their study to be correlated with association fluency ( $r = 0.15$ ) and originality ( $r = 0.12$ ). Although these results are not a strong correlation, in another study, Tegano (1990) found that AT was significantly correlated to a creative style index ( $r = 0.31, p > 0.01$ ). Brophy (2001) looked at the relationship between convergent performance, which relies on logical and analytical skills, and divergent thinking, which relies on ideation fluency and analogical reasoning, with tolerance of ambiguity. He

found those who had high ambiguity tolerance scores did significantly better on the divergent performance tasks than the convergent performance tasks; while those with low ambiguity tolerance, the opposite was true. Comadena (1984) looked at the relationship of creative performance of undergraduates during brainstorming sessions and observed that AT was positively related with the number of ideas generated (ideational fluency). In a more recent study, Zenasni and colleagues (2008) found that tolerance of ambiguity was moderately and significantly linked to fluency, as measured by divergent thinking tasks ( $r = 0.36, p < 0.01$ ). In addition, tolerance of ambiguity is often correlated positively with other constructs like willingness to take risks and receptiveness to change, which are also viewed as important traits for creativity, while negatively to dogmatism (Norton, 1975; McLain, 1993). Given these results, it appears that tolerance of ambiguity plays an important role as a personality trait and has predictive force for creativity mostly in regards to ideational fluency, risk taking, and openness to the novel and unfamiliar.

### Summary

In summary, as can be viewed in this section, there are a number of important individual differences to consider when looking at the creative person, beyond the personality factor, *openness to experience*. Though this list (self-efficacy, persistence, intrinsic motivation, curiosity and tolerance of ambiguity) is far from a comprehensive list of personality factors related to creativity, they have all been shown to have strong correlations to various measurements of it. Figure 4.1 illustrates this relationship.

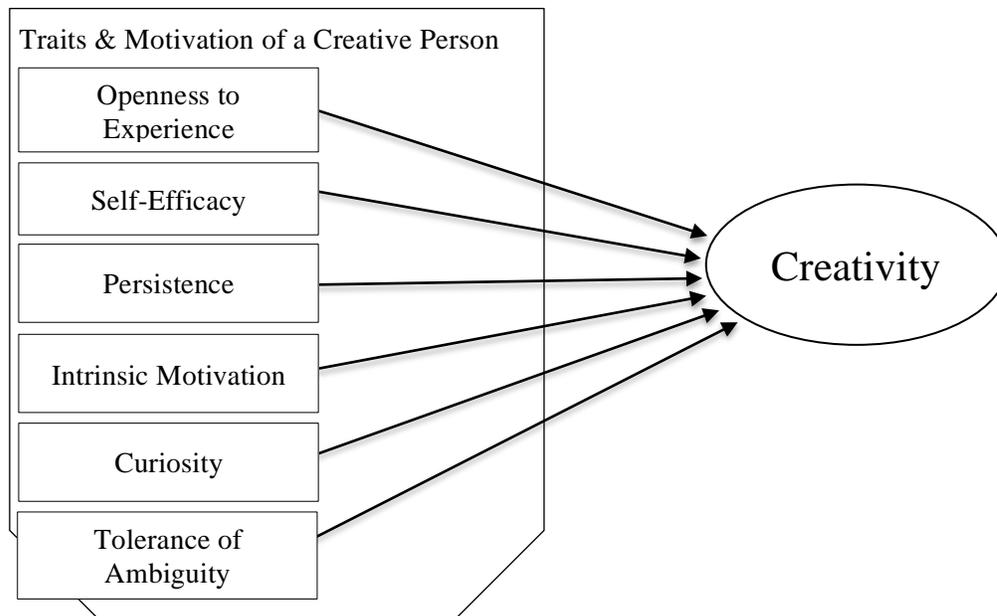


Figure 4.1: Illustration of individual difference factors of a creative person

In short, for this study, as described in detail in the following chapters, I designed two sets of creative personality questionnaires. The first questionnaire used items from the five-factor model of personality. The second questionnaire used the before mentioned traits (e.g., self-efficacy) to develop a set of items that looked at the creative personality from multiple trait dimensions. In the next subsection, I move from personality to the creative self-belief system.

#### 4.4 CREATIVE SELF-BELIEFS: “YES I AM CREATIVE”

People have a tendency to assess or consider their physical and mental abilities when confronted by tasks that are both novel and routine (Ackerman & Wolman, 2007). This leads to self-estimates of cognitive and other competencies and characteristics that constitute a self-concept. The question that often is raised is: how reliably do people provide self-estimates for a creative activity like “writing a poem”? When completing a self-estimate questionnaire, people often are susceptible to suffering from what is known

as the better-than-average effect. This self-serving effect reflects the tendency for people to evaluate themselves more favorably than others on behaviors and trait ratings (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995). Despite this obvious possibility and the intuitive skepticism towards self-evaluative questionnaires, a number of studies that have used such instruments have found them to have high predictability on creativity scores (see Table 4.4 for a list of some of these studies).

TABLE 4.4: THE RELATIONSHIP BETWEEN SELF RATED MEASURES OF CREATIVITY AND OTHER MEASURES OF CREATIVE POTENTIAL

Study	Strength of relationship	Creativity instrument
Furnham, Crawshaw, and Rawles (2006)	$r = 0.27, p < 0.05$	The Barron Welsh Art Scale
Furnham and Bachtiar (2008)	$r = 0.18, p < 0.05$	Divergent Thinking Test
Furnham, Batey, Anand, and Manfield (2008)	$r = 0.18, p < 0.05$	Divergent Thinking Test
Putwain, Kearsley, and Symes (2012)	$r = 0.36, p < 0.01$	Intrinsic motivation
	$r = 0.32, p < 0.01$	Extrinsic motivation
	$r = 0.28, p < 0.01$	Fluid intelligence <sup>8</sup>
	$r = 0.29, p < 0.01$	Literacy Achievement

Even though research is still relatively scarce, these types of self-rating assessments are often correlated with other important factors related to creativity (e.g., intrinsic motivation, divergent thinking, and fluid intelligence). Next I describe some scales that have been developed in order to look at ways to measure such creative self-ratings.

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<sup>8</sup> Fluid intelligence (gf) refers to the ability to solve novel problems such as those that require deductive and inductive reasoning (McGrew, 2005). It is often measured by a test called the Ravens's Standard Progressive Matrices (Raven, Raven, & Court, 2004) where subjects view a group of patterns with one section missing and they have to select from a list of possible elements the one that would keep the pattern consistent and whole.

Kaufman and Baer (2004) developed a self-rated questionnaire that measured the subjects' beliefs in their creativity in various domains. In this first version, called the Creativity Scale for Different Domains (CSDD), only 10 items were used and they were scored on a 5-point scale. Each item represents a different domain such as: science, managing interpersonal relationships, writing, art, interpersonal communication, solving one's own personal problems, mathematics, crafts (e.g., woodworking, sewing, repairing things, building things, cooking, etc.), and bodily/physical movement (e.g., dance, sports, etc.). An example for managing interpersonal relationships is as follows, "How creative are you in the area of managing interpersonal relationships?". In addition, there is one global item that addresses one's overall general belief in one's creativity. Furnham (2000) and Furnham and colleagues (2005) provide a slightly different approach to measuring creativity from a self-rating perspective in a questionnaire format called the Self-Estimates of Creativity (SEC). The items in this questionnaire were based on Gardner's Multiple Intelligences. The researchers simply replaced the word "intelligence" with "creativity". Therefore this questionnaire used the following categories: verbal or linguistic creativity, logical or mathematical creativity, spatial creativity, musical creativity, body-kinesthetic creativity, interpersonal creativity, and intrapersonal creativity. Subjects rated how creative they perceived themselves to be in each of these categories.

Later Kaufman (2006) further developed his inventory and expanded it to 56-items, which he called the Creativity Domain Questionnaire (CDQ), he subsequently through exploratory and confirmatory factor analysis determined seven general thematic areas of creative performance: Artistic-Verbal, Artistic-Visual, Entrepreneur,

Interpersonal, Math/Science, Performance, and Problem-Solving. This questionnaire was revised and shortened to 21-items that loaded onto 4 factors as can be viewed in Table 4.5 (Kaufman, Cole, & Baer, 2009). Each item is completed on a six-point scale ranging from 1 “Not at all creative” to 6 “Extremely creative”.

TABLE 4.5: 21-ITEMS AND 4 FACTORS IN THE REVISED CREATIVITY DOMAIN QUESTIONNAIRE (CDQ-R, KAUFMAN ET AL., 2009)

Drama	1) Acting
	2) Dancing
	3) English literature/criticism
	4) Keeping a journal/blog
	5) Vocal performance/singing
	6) Writing poetry/prose
Math/science	7) Algebra/geometry
	8) Chemistry
	9) Computers/computer science
	10) Life sciences/biology
	11) Logic/puzzles
	12) Mechanical abilities
Arts	13) Crafts
	14) Interior design/decorating
	15) Painting/drawing
Interaction	16) Leadership
	17) Money management
	18) Playing with children
	19) Selling people things
	20) Solving personal problems
	21) Teaching/education

Note: The four domain scores can be averaged to obtain a global creativity score. The items and instructions are published in Kaufman and colleagues (2009)

Kaufman (2012) more recently developed a self-report instrument called the Kaufman Domains of Creativity Scale (K-DOCS), which has 50-items that look at everyday creativity from different domain-specific perspectives. Similar to other self-report measures, subjects are asked to reflect and compare how creative they would rate

themselves as compared to other similarly aged individuals on a 5-point scale. The K-DOCS has five factors: Self/Everyday (e.g., “Teaching someone how to do something”), Scholarly (e.g., “Debating a controversial topic from my own perspective”), Performance (encompassing writing and music) (e.g., “Shooting a fun video to air on YouTube”), Mechanical/Scientific (e.g., “Writing a computer program”), and Artistic (e.g., “Sketching a person or object”). This approach focuses on the domain relevance or domain specific nature of creativity, which views creativity not as a general all encompassing trait, but highly influenced by a domain. For example, one study (Jeon, Moon, & French, 2011) found that domain knowledge in math explained more of the variance in creative performance in math than divergent thinking, but in art the reverse was true. So domain knowledge likely plays an important factor for creativity in some fields, especially ones like math and science, as the above style of questionnaires demonstrated.

In summary, as can be seen from the above review, there are a number of different ways to self-estimate or self-evaluate one’s perceived creativity by way of a questionnaire and such a method has increased in popularity and use over the past few decades and is still being developed and tested. The main differences appear to be length (ranging from 10 to 56 items) and the domains (artistic to mechanical or more general) used in the questionnaires. Although such a method may seem flawed due to the obvious problems associated with such questionnaires, as people are likely to amplify and overestimate their creative abilities when asked to compare themselves to others, these instruments have been shown to correlate well with other creative tests and personality instruments.

In order to look at the multiple dimensions of creativity, I developed a number of questionnaires for this study. In this subsection, I outlined the importance of self-beliefs in regards to creativity. Consequently, I developed a creative self-beliefs questionnaire for this study in Japanese, which is described in detail in the following chapter. In the next section, I look at the final part for assessing creativity and some say the most important for it looks directly at some perceivable product that the participant actually produces within the experimental setting.

#### 4.5 HAIKU: A SHORT POEM AS A CREATIVE PRODUCT

The final way of assessing creativity in this thesis is through a creative product. The creative product is often viewed as the source for any study on creativity. For example, Mackinnon (1987) contends that “the starting point, indeed the bedrock of all studies of creativity, is an analysis of creative products, a determination of what it is that makes them different from more mundane products” (p.120). So in essence, to be creative, one has to produce a creative product that is distinguishable and assessable like a short story, a poem, a drawing, or a sketch of an invention. The limitations of the experimental condition (time, resources, space, etc.) restrict what kind of products can be included in any study. Some have used collages or storytelling as a creative product task (Baer, 1993). Still others have used captions for pictures (Kaufman, Lee, Baer, & Lee, 2007) or poetry (Amabile, 1996; Kaufman, Baer, Cole, & Sexton, 2008). All of these different methods aim to get the participants to quickly produce some product that then could be assessed for creativity. Naturally all of them have the limitation of forcing an individual to be creative on the spot. It is this last method (poetry writing) that deserves more

attention since it is the method that I used in this research. Both Amabile (1996) and Kaufman and colleagues (2008) developed their own quasi-haiku form respectively called the “American Haiku” and the “SciFaiku”.

Haiku has become a popular form of writing poetry and continues to generate a wide amount of interest in Europe, the Americas, and other parts of Asia. School children outside of Japan often learn about it and practice writing it in class. This interest and fascination with haiku can be summarized by Blyth (1952) as follows:

It is not merely the brevity by which [the haiku] isolates a particular group of phenomena from all the rest; nor its suggestiveness, through which it reveals a whole world of experience. It is not only in its remarkable use of the season word, by which it gives us a feeling of a quarter of the year; nor its faint all-pervading humour. Its peculiar quality is its self-effacing, self-annihilative nature, by which it enables us, more than any other form of literature, to grasp the thing-in-itself (Blyth, 1952, pp. vol. 4, p. 980).

Japanese haiku (俳句 – haiku) are inherently short, simple, and profound and typically follow three important rules: haiku should have 17 syllables with a 5 – 7 – 5 pattern; haiku should contain a “cutting word” (切れ字 – kireji) that combines the two elements; and haiku should contain a seasonal word (季語 – kigo). Although these rules, especially the 17 syllables, have been questioned as being a necessary feature of this style of poetry, as haiku became internationally popular and began to be written in many different languages. In fact, Ross (1993) even suggests that the more recent generation of American poets have “through experimentation all but obliterated the requisite form and substance of classic Japanese haiku: there is a consistent lack of seasonal references, surrealist techniques and figurative expression are introduced” (p. xxiii). As haiku crossed borders it took on new forms and lost some of the rules associated with it and yet in its

economically minimal form, “haiku should leave the reader wondering” (Blasko & Merski, 1998, p. 40). Creative researchers took this form of poetry and altered it to fit their paradigm of research as a viable creative product. For instance, Amabile (1982, 1996) developed her “American Haiku” with the following instructions for the participants:

The instructions presented to subjects asked them to write a simple form of unrhymed poetry consisting of five lines: line 1 is a single noun; line 2 consists of two adjectives describing the noun; line 3 consists of three verb forms relating to the noun; line 4 contains any number of words (a phrase or sentence about the noun); and line 5 repeats the noun of line 1. For the poem they wrote at the beginning of the experimental session, subjects were given "Snow" as the first (and last) line (Amabile, 1985, p. 396)

She states “the format of the poem, this uniform theme was used in an effort to reduce variability and simplify creativity assessment” (p. 396). Kaufman and colleagues (2008) also created their own haiku form that also seeks to limit the theme of the poem by narrowing the range of topics to Science Fiction, which they playfully call SciFaiku.

Below are the instructions and an example:

SciFaiku is a form of poetry derived from haiku, a traditional Japanese poetry form composed of three lines of less than 17 syllables. The topic is science fiction. It strives for a directness of expression and beauty in its simplicity. SciFaiku also frequently strives for insightful commentary on the human condition. Here is an example:

on blackhole's edge  
indecision  
drifts me in (Kaufman et al., 2008 p. 177)

Haiku or writing a short poem is one example of a creative product used in creativity research. The biggest drawback with such a task is its high reliance on domain specific creativity. That is to say, it really focuses narrowly on literature, creative writing, and language competencies, as compared to other forms of creativities often found in math, the sciences, the digital world, and other domains. Undeniably, choosing a creative

product as a task in an experiment is a difficult choice and there are a number of constraints in the experimental setting, most notably material available to the participants and time. Despite these limitations, approaching creativity in a multifaceted way, it is important to use some type of product that provides an observable variable, as compared to solely relying on scores taken from questionnaires or self-report scales.

Csikszentmihalyi (1999) notes ideational fluency and openness to many ideas are good and valued personality traits, but “that objective quality called ‘creativity’ is revealed in the products, and that judges and raters can recognize it” (p. 314). This recognition of creativity by others is a crucial step in the creative process and in the next section I describe a technique that has been developed to do just this.

#### 4.5.1 THE CONSENSUAL ASSESSMENT TECHNIQUE: USING JUDGES AS EVALUATORS OF CREATIVITY

As briefly discussed in the previous chapter on metaphor, evaluating the creativity of a product like a poem or a metaphor is a difficult and challenging endeavor (as compared to conventional metaphors that typically have correct or incorrect responses). Using a statistical method, based on “uniqueness” of response, overlooks the social side of creativity and the importance of “finding the familiar” within the novel (as indicated by the Optimal Innovation approach in GSH). Therefore I mentioned the possibility of using a technique whereby a group of judges (experts in the given domain) endorse and agree that “yes this is creative”. This, in fact, is done in the real world with poetry contests and science awards. It is also done within research on creativity and the most common method is called The Consensual Assessment Technique (CAT) developed by Amabile (1982, 1996). This method is in stark contrast to the rating criteria found in divergent

thinking tasks, which were previously mentioned in this chapter, for these tasks seek to develop an objective way to measure creativity. On the other hand, CAT approaches creativity subjectively. According to this method, judges have the expertise, knowledge and background to be able to spontaneously recognize the creativity of a product (Amabile, 1982, 1996). Its popularity and success, as well as, having been shown to be reliable under various conditions (Amabile, 1996; Baer, 1994; Hennessey, 1994) have some calling it the “gold standard” of creativity assessment (Carson, 2006).

This technique does not attempt to theorize what creativity is, but rather relies on the subjective beliefs of the experts to “know” this. These evaluators work independently from one another and usually are provided very little guidance or criteria in how to rate the products, but are told to depend on their own sense of creativity. They are also told not to rate them according to some ideal standard, but relative to one another. Another important instruction that is usually provided to the evaluators is to go through all the products and simply provide each one a LOW, MEDIUM, or HIGH score and then shuffle the products and go through them a second time in a different order and provide a score based on some Likert-scale (e.g., 5-point scale). This is to reduce the effect of order on influencing the scores for the judges. Since most of the judges are not trained to do this, some instruction is usually provided, but again the researcher usually leaves it open enough for the evaluators to follow their own beliefs and set of appraisals. For instance, in one study, Baer (1994) provided the following instructions:

There is only one criterion in rating these tests: creativity. I realize that creativity doesn't exist in a vacuum, and to some extent creativity probably overlaps other criteria one might apply—aesthetic appeal, organization, richness of imagery, sophistication of expression, novelty of word choice, appropriateness of word

choice, and possibly even correctness of grammar, for example—but I ask you to rate the stories solely on the basis of your thoughtful-but-subjective opinions of their creativity. The point is, you are the expert, and you needn't defend your choices or articulate a definition of creativity. What creativity means to you can remain a mystery—what I want you to do is use that mysterious expert sense to rate the stories for creativity (Baer, 1994, p. 39–40).

Since the Consensual Assessment Technique (CAT) has had strong support and is the most widely used product-based assessment of creativity (Hennessey & Amabile, 1999), a number of studies have attempted to test its reliability, validity, and point out some limitations using it. The next section goes into more detail about these issues.

### Reliability, Validity & Issues with the Consensual Assessment Technique for Evaluating Creative Products

In the previous section, I outlined the CAT as a possible way to score the creative products, as well as, the before mentioned creative metaphor tasks. In this subsection, I go into more detail about the reliability, validity, and possible issues with this form of assessment. Developed on the basis that creativity assessment in research should reflect real-world assessment of creativity, the CAT shows that it obviously has ecological validity. In addition, using Cronbach's coefficient alpha, Amabile (1996) found good inter-rater reliability correlations from 0.7 to 0.89 using this technique. Moreover when the reliability is specific to the creative task of writing a poem (which typically consists of the American haiku, which is a five-line stanza poem usually referred to as cinquains), the reliability is consistently high (0.82 ~ 0.89). In one study, using 151 undergraduate students and 4 English graduate students as judges, the reliability score was 0.89 (Ruscio, Whitney, & Amabile, 1996).

Though one major question involving CAT, as an evaluative method in creativity research, is the ambiguity surrounding the word “experts”, which Amabile (1996) loosely defines as individuals “who have at least some formal training and expertise in the target domain” (p. 73). Hickey (2001) points out that Amabile theorizes inter-judge reliability by experts is a direct indication of construct validity, as she states, “if appropriate judges independently agree that a given product is highly creative, then it can and must be accepted as such” (Amabile, 1982, p. 1002). Yet finding experts to do such an assessment is not an easy task. Consequently, there has been a considerable amount of research into the reliability of using non-experts or quasi-experts whereby the researcher attempts to train these individuals to become more expert-like in their assessments (Dollinger & Sharafran, 2005; Kaufman & Baer, 2012; Kaufman, Lee, Baer, & Lee, 2007). In the study by Dollinger and colleagues (2005), they compared the creativity ratings of drawings between a group of expert judges and trained non-expert judges and found that their scores were highly correlated. The training consisted of showing the non-experts 16 representative drawings to illustrate prototypical levels of creativity assessments (by expert artists) before they had to evaluate the drawings in the study.

In fact, in some studies, the experts actually showed lower levels of reliability than the non-experts. For instance, Hickey (2001) used a numbers of raters (composers, music teachers, music theorists and even two groups of children) to judge the creativity of 11 musical compositions by children. He found that the music teachers and theorists showed the highest inter-judge reliabilities (0.73 and 0.64 respectively). Composers showed the lowest inter-judge reliabilities, even lower than the children. He concludes by indicating that the teachers appear to be the most reliable judges of creativity. Dolinger

and colleagues (2004) showed similar results in a different domain. Using a drawing production task, he then had a group of psychologists and a group of artists rate the drawings for creativity on two measures, details, and the overall gestalt of the drawing. The alpha reliabilities for the psychologists were 0.88 and 0.85, respectively, and for the artists, 0.59 and 0.78. Such findings have shifted the notion of ‘expert’ to a more temperate view and recently researchers have suggested that raters should “be familiar enough with the domain to have developed, over a period of time, some implicit criteria for creativity” (Hennessey, Amabile, & Mueller, 2010, p. 256). The poems completed in this study relied on the assistance from Japanese colleagues with either linguistic or literature backgrounds and can be assumed to have acquired sufficient knowledge to reliably judge the creativity of the poems. It should also be noted that judgments of creativity based on the CAT is limited by various factors like historical time, societal trends, and cultural norms (Amabile, 1996). In the final section of this chapter, I feel it is necessary to provide a brief section on creativity and culture, especially as it applies to Japan since this research took place in Japan and all the participants are university aged Japanese students.

#### 4.6 A NOTE ON CULTURE AND CREATIVITY: THE CASE OF JAPAN

Creativity is highly valued and perceived positively across cultures (Westwood & Low, 2003). Japan like other areas of Asia (e.g., Hong Kong, Singapore) has recently been aggressively pushing to advance creativity in business, education, and society (MEXT, 2006; Tan, 2000). The Ministry of Education in Japan explicitly lays out the importance of creativity as they urge the need to “train researchers with broad perspectives who are

rich in *creativity* and originality ... it is critical to foster and secure exceptional young researchers with abundant *creativity*” (MEXT, 2006 part 3.3.1.1 (2) & (3) *italics are mine*). It would be far beyond the reach of this thesis to provide a rich description of how culture impacts creativity, but as the research in this thesis took place in Japan, it is important to briefly consider the cultural setting.

Asian cultures have had to confront what has become known as the “creativity problem” or the “Needham Problem”, which questions why Asian cultures have fallen behind the West in regards to creativity. This notion of Asians lacking creativity has been reinforced by the publication of various popular books in Singapore such as, *Why Asians Are Less Creative Than Westerners* (Ng, 2001) and *Can Asians Think?* (Mahbubani, 2002). Such authors who propagate this “creativity problem” in Asia often point out how the values (e.g., Confucian values) that a culture observes, encourages, and transmits to the young can have a strong influence on creativity within the culture. Values that are commonly associated with Confucianism have been pointed out to hinder and stifle creativity such as conformity (Lubart, 1990), conservatism (Dollinger, 2007), and authoritarianism (Rubenstein, 2003).

Japan tends to be lumped together with those of other Confucian cultures. These cultures have often been said to advocate conformity, have high power distance (e.g., hierarchical) and be collectivistic societies. I do not attempt to refute any of these claims outright, but provide some evidence that may contradict these assumptions. The work of Hofstede (2001) often provides the source for the collectivistic-individualistic dichotomy that places countries along this continuum. In an attempt to contrast the West with the

East in a generalizable way, Japan somehow became the exemplar of collectivistic societies in the East. This is despite the contradicting data where in fact, at the time period when Hofstede (2001) conducted his study, Japan (22/23<sup>9</sup>) measured more closely with the western nations of Argentina (22/23) and Spain (20) than with the eastern nations of Taiwan (44), Singapore (39/41), or South Korea (43) in regards to the cultural dimension of individuality. This whole dichotomous notion of western countries (U.S. often being the exemplar), as being individualistic, and eastern countries (Japan), as being collectivistic has been questioned and any assertion that such a dichotomy exists is far from conclusive and actually lacks empirical support (see Matsumoto, 1999; Oyserman, Coon, & Kimmelmeier, 2002; Takano & Osaka, 1999; Takano & Sogon, 2008). In addition, Japanese are often viewed as conforming more to societal norms than those in the West, yet again empirical evidence suggests otherwise, where in the classic Asch's conformity experiment, Japanese conformed no more than Americans (Williams & Sogon, 1985; Takano & Sogon, 2008).

Moreover when examining creativity from a cultural or national perspective, choosing how to examine "creativity" can be rather diverse and subjective. For instance, if we look at patents as an indicator of innovation and creativity within a country, Japan by far has the most patents. For instance Japan has been granted 177,750 in 2014, which ranks top in the world, as compared to 144,621 for the USA, a country that has more than double the population (WIPO, 2016). Or if we take a different domain like food creativity

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<sup>9</sup> These numbers refer to the Individualism Index Values for 50 countries and three regions (Hofstede, 2001 p. 215). Note: where there are two numbers, this means that two countries have the same score.

and use the Michelin guide as the group of judges, Tokyo has more stars than even Paris (Robinson, 2007).

I acknowledge that culture has a strong impact on creativity, both in terms of encouraging and constraining it, but culture is something dynamic and changing and in the current environment in Japan, creativity is highly valued and there are attempts to cultivate it within the educational system. Also Japan has a longer history of research and interest in regards to the psychology of creativity than often asserted in the literature. Books on the topic have been written since the early 1900s, especially in regards to education (see Akiyama, 1983; Onda, 1986 for a brief history of creativity research in Japan). Torrance's divergent thinking tests have also been used in Japan since the 1970s (Torrance & Sato, 1979; Sato & Onda, 1978) and continue to be used (Saeki, Fan & Dusen, 2001). The interest in encouraging creativity can be exhibited in how language reflects and reveals these changing trends, whereby in the past the common saying, 出る杭は打たれる (deru kui ha utareru - "The nail that sticks up gets hammered down"), I have noticed has been playfully altered in a university education document to 出るくいを伸ばす (deru kui wo nobasu - "Extending the nail that is sticking up"). So the two contrasting images from these idiomatic expressions are one of conformity and constraining uniqueness and originality and the other of encouraging and promoting one's uniqueness. The point here is to show that creativity is an important element of education and highly regarded within the overall society in Japan.

#### 4.7 SUMMARY OF CHAPTER 4

In this chapter, I have shown the wide range of instruments frequently used to measure creativity. It has become more generally agreed upon that the best way to measure the multifaceted nature of creativity is to use multiple instruments that approach creativity from varying dimension like the product, the process, and the person. This chapter has outlined these differing dimensions and ways that previous research has attempted to measure it, as well as, the relationships between these numerous variables. In summary:

- Divergent thinking tasks provide a glimpse into the creative process and creative potential of the individual and really measure ideational thought, or the ability to come up with many ideas, and originality;
- Past creative achievement is a good predictor of future creative activities;
- Openness to Experience is a crucial personality trait that has been shown to be highly correlated with various other creative measurements in various cultural settings;
- Numerous other individual difference variables like tolerance of ambiguity, self-efficacy and intrinsic motivation also are highly relevant and important for creativity;
- People are aware of their own creativity and self evaluations of creative abilities also provide more insight into the creative person;
- Finally creativity is most strongly associated with some tangible product like a poem or invention, which is judged to be creative by some group at a specific time within a certain social environment.

In the next chapter, I describe a pilot study that provided valuable insight into the difficulties of gathering data and how I developed the final measurement tools to assess creativity and *creative metaphoric competence*.

## **Chapter 5 A Pilot Study and the Development of the Creativity Instruments and Creative Metaphor Production Tasks**

Developing the necessary instruments to measure creativity and *creative metaphoric competence* proved to progress slowly and along a nonlinear path. Throughout the academic years of 2013-2015, I experimented with various tools to assess these abilities in English classes that I taught at the university. For the creativity instruments this usually involved having the students do divergent thinking tasks or produce some creative product during class. I often integrated them into the lesson as a learning tool to build students' creativity with the language (see Birdsell, 2014). I also administered questionnaires at the end of class along with other teachers in my department who volunteered to distribute them in their classes. The metaphoric competence tasks were often integrated into awareness raising exercises that aimed to get the students to become more aware of the underlying metaphorical structure motivating many metaphors found in natural everyday language. Through the use of these tasks, I began to realize they mostly developed students' vocabulary knowledge of conventional expressions and failed to assess novel metaphors. So I shifted my focus to simpler and more open-ended exercises that prompted students to produce their own metaphors. In this chapter, I go into more detail of how I developed these various instruments. I first begin by describing a small pilot study, as a way to frame the discussion, and then throughout the chapter weave together other studies that I conducted that helped me finalize and narrow down the instruments into the versions that I eventually used in the main study.

## 5.1 LESSONS FROM A SMALL PILOT STUDY

In February of 2015, I conducted a lengthy, but small, pilot study to test the instruments and methods of collecting the data. Seven informants volunteered to participate in the study and were paid an hourly wage of 850 yen/hour based on university guidelines for student employment. This study took 3 hours to complete and was conducted in a classroom at the university. The participants sat at a desk and then received a folder with the materials inside it. The first step required the participants to sign a consent form (see Appendix A). Then they filled in their age, faculty, sex, TOEIC and TOEFL scores on the outside of the folder. This front page was bilingual written in both English and Japanese. The following material was inside the folder and numerically labeled:

- (1) Vocabulary Test
- (2) Questionnaires
- (3) Creativity Tests
- (4) English and Japanese Metaphor Tests

A PowerPoint presentation guided the participants through each section. In this chapter, I cover various elements of the above sections of this pilot study. I first briefly address the vocabulary test and then the development of the creativity instruments and finally the creative metaphor production tasks.

## 5.2 THE VOCABULARY TEST

Many students take the TOEIC and TOEFL tests while attending university in Japan, yet it is definitely not mandatory, so I considered that there would be many blank responses in the section that asked them to input these scores. Recognizing this and considering the

importance of having some data on the participants' English level, I looked at other ways to assess their English abilities. Since the participants completed a number of instruments for this study, I needed to use something short and efficient. Therefore I decided to use an abridged version of a vocabulary test based on Paul Nations and David Beglar's "Vocabulary Size Test" (2007). This test aims to measure vocabulary size based on word families of the 14 most common 1000 sets of words. In each word family there are 10 vocabulary items, so there is a total of 140 items on the original test<sup>10</sup>. Again in order to minimize the time to complete this vocabulary test, these items were reduced to 5 items of vocabulary for each 1000 set of words, so I used a 70-item test. The method of reducing this number was based on the following: removing borrowed English words that have an equivalent "katakana" word in Japanese and words that I found rather rare or unusual like "weir: We looked at the weir" and "lintel: He painted the lintel". This is far from a perfect method of reducing a large vocabulary test, but again it is a supplementary part of the overall research. Together with a standardized test like a TOEIC score, this vocabulary test provided some insight into the participants' English levels. This test was rather straightforward and did not change between the pilot and main study.

### 5.3 DEVELOPMENT OF THE CREATIVITY INSTRUMENTS

The idea that creativity can actually be assessed or measured by way of a psychometric tool or self-assessment questionnaire is in itself rather controversial. I, by no means, suggest that the tools I developed in this research reveal the social side of creativity or the full range of creativity in varying domains of experience. Rather, I propose that these

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<sup>10</sup> To see the original [http://www.victoria.ac.nz/lals/about/staff/publications/paul-nation/Vocab\\_Size\\_Test\\_Japanese.pdf](http://www.victoria.ac.nz/lals/about/staff/publications/paul-nation/Vocab_Size_Test_Japanese.pdf)

tools that I developed for this research do provide some insight into the creative individual from a multidimensional perspective including personality, past creative achievements, belief in one's creativity, and ability to produce creative products. I discuss each of these in greater detail in the following subsections.

### 5.3.1 THE QUESTIONNAIRES

In the pilot study, the participants completed two different questionnaires: a 60-item Big 5 personality questionnaire and a 66-item creative person questionnaire that looked at various creative traits, as outlined in the previous chapter (e.g., self-efficacy, curiosity, etc.). These questionnaires I concluded after the pilot study were too long, so my first goal was to reduce the items on these two questionnaires. To accomplish this, I created something called the *16-item Five-Factor Model of the Creative Personality Questionnaire (FFM-CPQ)* and the *24-item Creative Personality Questionnaire (CPQ)*, which I describe in more detail below.

#### Creativity: The 16-item Five-Factor Model of a Creative Personality Questionnaire

In the pilot test, I used a 60-item (12-items for each of the Big 5 factors) personality questionnaire developed from items from the International Personality Item Pool, as described in Chapter 4.4 (see Goldberg et al., 2006 or <http://ipip.ori.org>). In order to reduce the number of items on this questionnaire, I first reduced the 60-items to 50-items. These items consisted of the following: 9 items for conscientiousness, neuroticism, extraversion, and agreeableness; and 14 items for openness to experience. The additional items for openness were used since openness is the factor most commonly correlated with creativity (McCrae, 1987). The goal was to create a streamlined creative personality

questionnaire based on the five-factor model for the main study. In order to accomplish this, undergraduate university students (n=130, male=70) in various faculties at a university in northern Japan were asked to complete a questionnaire that asked them to score on a 6-point scale the characteristics they believed a creative person has. I did this for two main reasons. First, I wanted to develop a questionnaire based on students' perspectives of a creative personality. Secondly, I wanted to condense a very long questionnaire that dealt with various personality types (e.g., agreeableness and neuroticism) to a more manageable one that solely focused on the creative personality. It should be noted here that this is a rather unusual approach since most questionnaires are self-assessment in style, so I explicitly told them both verbally and on the questionnaire that this was not a personality test about themselves, but they were to score these items based on their own perceptions and beliefs of a highly creative person. The questionnaire was phrased as follows:

- I think the characteristics of a creative person are...

The questionnaire was administered during the last 10 minutes of an English class. The questionnaire included items from the five personality factors and it was completed in Japanese (see Appendix C for the complete list of items included on this questionnaire along with the mean score for each one). I then took the 11 highest and 5 lowest (reverse) items based on their mean scores and created, *The 16-item FFM-CPQ* (Five-Factor Model of the Creative Personality Questionnaire). Openness to Experience items made up most of this list, as was to be expected, along with a few Extraversion items. As mentioned in the previous chapter, Extraversion has also been shown in the literature to

be frequently correlated with creativity. This might also suggest that creativity is part of a higher order common factor or meta-trait referred to as “plasticity”, which encompasses both Openness and Extraversion. This is compared with the second factor, “stability”, which encompasses Neuroticism (emotional stability), Agreeableness, and Conscientiousness (see DeYoung, 2006; Silvia et al., 2009).

There are also three items from the factor Agreeableness. One item has to do with understanding others’ emotions and the second item is a very complex concept called “sunao” in Japanese. This word has multiple meanings in English such as: “spare, plain, bare, unembellished, unornamented, accepting, straightforward, obedient”<sup>11</sup>. This is typically opposite of a creative person within a Western context for according to Gough’s (1979) adjective list of a creative person, negative traits include such items as “submissive and well-mannered”, which “sunao” encompasses. In addition, the reverse item, manipulative, was also included. The one item from Conscientiousness, a reverse item, “does things in a sloppy manner”, perhaps reveals the importance of careful and systematic planning that goes into accomplishing something creative. There is one item from the factor neuroticism that could have been included based on its cumulative low score, but was not included because I judged other items with comparable low scores to be more suitable for a study on creativity. Table 5.1 provides the final list of items, their factors, means, and overall ranking. This questionnaire was then used for the main study.

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<sup>11</sup> <http://ejje.weblio.jp/content/素直>

TABLE 5.1: RESULTS FROM A STUDY TO DEVELOP THE 16-ITEM FFM CREATIVE PERSONALITY QUESTIONNAIRE (SEE APPENDIX D FOR THE ORIGINAL JAPANESE VERSION)

<sup>a</sup> Scale / Item (6-point scale)	Mean	<sup>b</sup>
O Has a rich imagination	5.28	1
O Has wide interests	5.25	2
O Likes to get lost in thought	5.11	3
O Is very curious about learning new things	5.08	4
O Sees the beauty in things that others might not notice	4.85	5
E Often searches for stimulating things	4.77	6
E Is very energetic	4.71	7
A Is “sunao”	4.63	8
A Feels others’ emotions	4.62	9
O Plays it by ear	4.6	10
O Likes to solve difficult problems	4.52	11
E Is afraid to draw attention to oneself *	2.65	45
C Do things in a half-way manner / Does a sloppy job of work *	2.60	46
A Is manipulative *	2.48	47
O Has a narrow world view *	2.4	49
O Not really interested in art and other works of beauty *	2.24	50

<sup>a</sup> Refers to factor (O, Openness to Experience; E, Extraversion; A, Agreeableness; C, Conscientiousness)

<sup>b</sup> Refers to the ranking based on the means \* Refers to reverse items

### Beyond the Big Five: A 24-item Creative Personality Questionnaire

To develop a creative personality questionnaire that goes beyond the Big 5, I decided to focus on the following traits: self-efficacy, persistence, intrinsic motivation, curiosity, and tolerance of ambiguity. I selected items from various questionnaires (as outlined in the previous chapter) that aimed to explore these components, which resulted in a 66-item questionnaire that was used in the pilot study. As I mentioned at the start of this section, I soon realized from administering, observing, and discussing afterwards with the student participants in the pilot study that this questionnaire’s length was too long and contained too much information. I accordingly reduced the number to 44 items (see Appendix E). This revised 44-item questionnaire was then administered to university students at the end of an English class. I collected a sample size of 185 responses and performed a principle components analysis on these items for the purpose of data reduction and to

look for interrelated correlations between the variables. Despite the sample size being slightly small for the recommended minimum 5 cases for each item (making an ideal size of 220), I did obtain a measure of sampling adequacy above the 0.6 level (.788) as measured by Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity was significant ( $p < 0.001$ ).

To achieve simple structure, I rotated the loadings using an orthogonal technique (Varimax) because I did not perceive these items to be highly correlated with each other. I limited the loading to a 0.4 bivariate correlation or above. Five components had eigenvalues above 1 and explained 41% of the variance. I went through the items and removed the ones (a total of 7 items) that did not load onto any of the components. I also removed the fifth component since it only had two items. In addition, I also removed items that loaded low on the four components or those that contained similar language between the items. Through this process, I was able to reduce the initial 44 items to a more manageable 24-item questionnaire with four components, which explained 49% of the cumulative variance. Looking through these items, the four components could be theoretically labeled as the following: (1) Self-efficacy; (2) Persistent goal directed motivation; (3) Reluctance / Intolerance to ambiguity; and (4) Exploratory motivation. See Table 5.2 below for the items and loadings on the respected components.

TABLE 5.2: PRINCIPAL COMPONENT ANALYSIS – ITEM REDUCTION TO 24 (SEE APPENDIX F FOR THE ORIGINAL JAPANESE VERSION)

a		Component			
		1	2	3	4
37	I often think of new ways to use things around me.	.697			
22	I'm good at finding common characteristics among dissimilar things.	.695			
06	I believe I am good at adapting to new and unfamiliar situations.	.670			
2	I am good at proposing original solutions to a problem.	.634			
32	I am knowledgeable about many different subjects.	.611			
12	I am good at making analogies.	.579			

04	In a discussion, I rarely have an opinion on the topic.	-426	
19	I often am absorbed in my studies and lose track of time.	.699	
42	I usually accomplish what I set out to do.	.665	
13	I have a “never give up” attitude in life.	.644	
07	I am studying at university simply because I enjoy learning new things.	.577	
26	I quit when I cannot solve a problem.	-.527	
30	I prefer to conform to the rules than stand out.		.778
35	I like to strictly follow a daily routine in my life.		.735
20	I am not very curious.		.589 -450
18	I prefer a teacher who is serious than one who is playful.	-.401	.544
08	When confronted by a risk I will choose the safer side of things.		.533
21	I am reluctant to participate in new endeavors.		.494
34	I like things that are new and unusual.		.636
01	Acquiring new knowledge about the world is very stimulating to me.		.624
39	I often daydream.		.602
25	A good teacher is one who gets students to become more curious about the world.		.600
15	I like to discover new things on my own outside of class.		.576

<sup>a</sup>The number it appeared on the questionnaire

After having reduced these two questionnaires in the pilot study down to a 16-item *FFM-CPQ* and a 24-item *CPQ*, I decided that I also needed to include other instruments to fully assess the creative person from a multidimensional perspective, namely, a Past Creative Achievement Questionnaire and a Creative Self-Beliefs Questionnaire. As mentioned in the previous chapter, these types of questionnaires have been widely used in the literature on creativity and creative achievement questionnaires are commonly used to measure real world creativity, as past creative achievements is often indicative of future creativity. In the next section I address how I developed these for the main study.

#### Development of Two Self-Report Questionnaires: Creative Achievements & Creative Self-Beliefs

A 34-item *Past Creative Achievement Scale* (see Table 5.3 for the full list of items) was developed in order for the participants to self report their own past creative achievements in various domains suitable for university students in Japan. I adapted and developed a Japanese version from previous research (see Batey, 2007; Dolinger, 2003; and Carson et

al., 2005) with items that look at everyday creative activities. I focused the questionnaire on four domains:

- Music, Arts, and Writing
- Math, Science, and Computers
- Clubs, Theater, Dance, Performance and Presentation
- Home Arts

The first domain consists mostly of the traditional forms of art such as painting, poetry, and playing an instrument. The second domain looks more at the scientific side of creativity, such as using computers and winning math or science awards. The third domain focuses on the performance side of creativity that assesses things like dance and theater. The final domain looks more at everyday creativity. There is also a final open-ended item where the participants can add other creative achievements they feel they have accomplished that are not represented on this questionnaire. Similar to Batey's (2007) study, this questionnaire follows a simple binary format in the form of a Yes/No question. For example on item #1, the participants were asked the following:

- Outside of your school classes have you ever taken an art class?

The scoring for this questionnaire was weighed differently depending on the creative achievement. For example, the above item has a score of "1" while the following item #4 has a score of "3", which is the highest possible score:

- Outside of your school classes have you ever sold an item of your art?

In this questionnaire there is a total maximum score of 60 points, plus any additional items the participant added to the the open-ended “other” item that appears at the end of this questionnaire. Any written-in “other” items were given a score of “1”. The questionnaire begins with the following statement:

- Outside of your school classes have you ever ~

Table 5.3 provides the full list of items translated into English (see Appendix G for the original Japanese version).

TABLE 5.3: 34-ITEM PAST CREATIVE ACHIEVEMENT SCALE

<sup>a</sup>	Scale / Item
<b>MUSIC, ARTS and WRITING</b>	
1	1. ~ taken an art class
2	2. ~ won a prize for your art
2	3. ~ displayed your art in an exhibition
3	4. ~ sold an item of your art
1	5. ~ studied one of the traditional Japanese arts (flower arrangement, calligraphy, tea ceremony)
2	6. ~ displayed your traditional Japanese arts (flower arrangement, calligraphy, tea ceremony) in an exhibition
1	7. ~ done creative writing (poetry, short story, novel, manga)
2	8. ~ won a prize for your writing
2	9. ~ participated in a public reading of your writing
3	10. ~ published your writing in a journal or book
1	11. ~ taken a music class
2	12. ~ won a prize for your music
2	13. ~ publicly played a music concert
3	14. ~ recorded your own music
<b>MATH, SCIENCE AND COMPUTERS</b>	
2	1. ~ designed your own web site
2	2. ~ put together your own computer, radio, or other electronic device
2	3. ~ designed your own software
2	4. ~ won a prize at a science fair or local science event
2	5. ~ won a math award
2	6. ~ invented something that has actually been made and used by other people
3	7. ~ published in any kind of scientific research journal
<b>CLUBS, THEATER, DANCE, PERFROMANCE and PRESENTATIONS</b>	
1	1. ~ started your own club

- 2 2. ~ acted live on stage for a theater play
- 2 3. ~ directed or produced a play or a short movie (YouTube)
- 2 4. ~ performed publicly in a dance performance
- 2 5. ~ done live comedy
- 2 6. ~ won a prize at a speech or presentation contest

---

HOME ARTS

- 1 1. ~ invented a game
  - 1 2. ~ cooked your own original recipe
  - 1 3. ~ planned a trip by yourself
  - 1 4. ~ designed your own clothing
  - 1 5. ~ made someone a present
  - 1 6. ~ made your own jewelry
  - 1 7. ~ collected things (coins, stamps, insects, tape)
  - 1 Write down any other creative activities you have accomplished
- 

<sup>a</sup> This number is the possible score for each item

In addition to the above *34-item Past Creative Achievement Questionnaire*, I also developed a questionnaire that evaluates one’s beliefs in one’s own creative abilities. This questionnaire was adapted and developed from previous studies, as outlined in Chapter 4.4 (see Furnham, 2000; & Kaufman et al., 2009). This questionnaire is called the *24-item Creative Self-Beliefs Scale* (See Table 5.4 for all the items). Similar to the Past Creative Achievement Questionnaire, this one is divided into different domains of experience; The Arts and Performance; The Social Self; and Science, Math, and Logic. The participants were asked to rate how creative they believe they are on a 10-point scale, “1” is “not at all creative” to “10”, which is “very creative”.

TABLE 5.4: THE 24-ITEM CREATIVE SELF-BELIEFS SCALE (SEE APPENDIX H FOR THE ORIGINAL JAPANESE VERSION)

Scale / Item
<b>The Arts and Performance</b>
1. Writing poems or short stories.
2. Coming up with humorous jokes.
3. Doing art (drawing, painting, photography, pottery, graphic design).
4. Playing a musical instrument or singing.
5. Giving a speech or presentation.

6. Home life (clothes fashion, gardening, cleaning, cooking).
  7. Doing sports, gymnastics or dance.
  8. Acting in film or theater.
- 

#### **The Social Self**

1. Brainstorming new ideas with your friends.
  2. Settling disputes between friends.
  3. Finding something fun to do even when you don't have any money.
  4. Traveling and interacting with other cultures.
  5. Teaching something to someone.
  6. Thinking of ways to help the community.
  7. Making people feel relaxed and comfortable.
  8. Maintaining a good balance between my studies and my personal life.
- 

#### **The Sciences, Math and Logic**

1. Sketching out ideas that you come up with for inventing a new product.
  2. Putting together electronic devices (radio, computer, robot).
  3. Solving difficult math problems.
  4. Doing puzzles or figuring out riddles.
  5. Doing experiments.
  6. Coming up with ways to fix a buggy computer.
  7. Writing a computer program.
  8. Thinking of new ways to use things around you.
- 

#### Summary: The Questionnaires

In summary, I developed four distinct questionnaires that aim to measure different facets of the creative person.

- The first questionnaire (16-item FFM-CPQ) focuses on the personality of the individual and uses items from the Big 5 personality traits that have been judged to be essential traits for a creative person.
- The second questionnaire (24-item CPQ) goes beyond these Big 5 traits and expands the creative personality to include such items as motivation, persistence, and self-efficacy.

- The third questionnaire (34-item Past Creative Achievement Scale) moves away from the personality traits and concentrates on past creative achievements.
- Finally the fourth questionnaire (24-item Creative Self-Beliefs Scale) addresses how one perceives one's own creativity in various domains of experience.

In the next section, I discuss different instruments that prompted the participants to produce a creative product or something tangible during the study that then could be assessed for creativity by a group of judges.

### 5.3.2 THE CREATIVE PRODUCTS

In the previous chapter, I described various ways to measure creativity by assessing a creative product that the participants actually had to produce. Using a creative product to measure creativity has strong construct validity since the participants' aim in this task is to create something novel and meaningful. Although the common issue that researchers face is choosing a task that can be done in a short amount of time and not require some domain specific skill (e.g., compose a song, sculpture, etc.) that is likely unevenly distributed among the participants. Past research has used various tasks from collages to stories to poems. Each of these tasks has their own limitations. Since this research aims to look at creativity from many different dimensions and thus requires multiple instruments, I decided to choose both verbal and figural creative product tasks. I describe below the development of a creative product that uses a haiku-like format and a second one that uses drawing prompts.

Development of a Creative Product: The Haiku

In the previous chapter, I discussed the work of Amabile (1996) and how she developed a creative product assessment tool called the “American Haiku”. I informally tested a modified version of it in English classes during the 2014 academic year. I provided the class with the example in Figure 5.1.

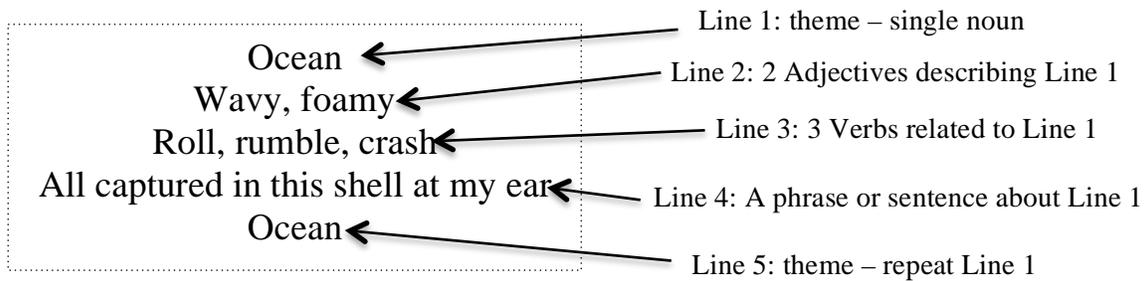


Figure 5.1: Creative product: An American haiku

In class, students produced a poem in English with the following seasonal topic, “Winter” while using the writing style found in Figure 5.1. In a different class, students had the seasonal topic, “Spring”, and they also were asked to write a second “American Haiku” with their own topic. Table 5.5 provides some examples of these students’ poems.

TABLE 5.5: EXAMPLES OF STUDENTS’ POEMS BASED ON THE “AMERICAN HAIKU” FORMAT

Winter Cold, snowy Ski, slip, snow We don’t want to go out Winter	Winter White, beautiful Ski, skate, sled Sports and views are very interesting Winter
Winter Cold, beautiful See, feel, enjoy All things look white Winter	Winter Cold, cool Roll, play, fun I make a snowman Winter
Spring Beautiful, misty Bloom, meet, separate The best season of separating is Spring	Spring Warm beautiful Flourish, born, breathe Trees grow in clear forests Spring

Spring Warm, shining Active, hope, sing Everyone wants to change one's self Spring	Spring Windy, beautiful Jog, kiss, date I've kissed the girl - Spring
Tuna Juicy, glossy Swim, fast All Japanese love it Tuna	Sun Hot, powerful Work, roll, fire I must work like that Sun
Moon Lonely, chill Shine, break, fill He gives us kindness and sadness Moon	Street Crowded, busy Greet, dart, surprise Funny accidents happen Street

What becomes apparent here is that the differences between the poems seem negligible and difficult to evaluate. This task requires the participants to follow a very rigid pattern of writing (e.g., 2 adjectives followed by 3 verbs) and what appears to happen from looking at the poems created by the participants is that there are a number of repeated words like “cold” and “white” for winter and “warm” and “beautiful” for spring. What becomes evident is that this creative product turns more into a divergent thinking task that aims to measure statistically unique adjectives for these topics. Another concern here is that this American Haiku format is structured for the English language and would not work the same in Japanese.

Bearing these concerns in mind, in the pilot study, I asked the participants to use Japanese and in order to get enough variation between the poems, I provided fewer restrictions and only instructed them to write a short poem like a haiku and incorporate one of the four seasons as the topic. Below are the instructions provided in the pilot study for the creative product:

Write a short poem like a Haiku or Tanka. Use one of the four seasons as the theme of your poem.

Table 5.6 provides two examples of the participants' poems, which I have loosely translated into English. Participant #1 actually wrote a *Tanka* style of poem, which is similar to a *Haiku*, but slightly longer and follows a 5-7-5-5 syllable pattern (unfortunately I was unable to maintain this in the translation). It also likely has a double meaning in the final line. The word (しふく - shifuku) means bliss, but also ordinary or private clothes, which may refer to being naked (i.e., similar meaning to "birthday suit"). Participant #6 wrote a longer poem that used free verse and long descriptive sentences. The responses from the participants in the pilot study demonstrated that this format works well as a creative product task.

TABLE 5.6: EXAMPLES OF PARTICIPANTS' POEMS FROM THE PILOT STUDY (SEE APPENDIX I FOR THE ORIGINAL JAPANESE FOR THESE 2 SELECTED POEMS)

English Translation of Poems
<p><u>Research Participant #1</u></p> <p>Only in Autumn            Do I go out on the veranda            Just after the wind blows            Nakedness all around            A time of bliss</p>
<p><u>Research Participant #6</u></p> <p>The snow doesn't melt, so around the base of the cherry tree I scatter hot water.            Though in the kettle the water was boiling, by the time it reached down to the cherry tree, it had cooled.            Where the lukewarm water had melted the snow around the roots, one part of the snow had changed to ice.</p>

In order not to rely too much on language for a measurement of creativity, I also developed a creative product that involves two types of drawing tasks. I explain how I first developed one of these tasks from a DT activity and then over the past couple of

years administering it to students established a dataset of drawings, which was used to assess originality.

### Development of the Creative Product: Complete a Drawing

Over a span of years (2013-2015), I used the *picture completion* DT task in my English classes as a mini-lesson to get students to creatively draw a picture and then describe the picture to a partner. I found that this exercise could be done in a short amount of time and in fact resulted in a creative product that could be assessed on a couple of dimensions like originality and overall creativity. This provides a creative product quite different than the haiku poem for it relies less on language and more on nonverbal abilities like drawing and imagery. The only constraint is that the participants had a limited amount of time (10-15 minutes) and they had to start by using four lines that appear on the page, as shown in Figure 5.2.

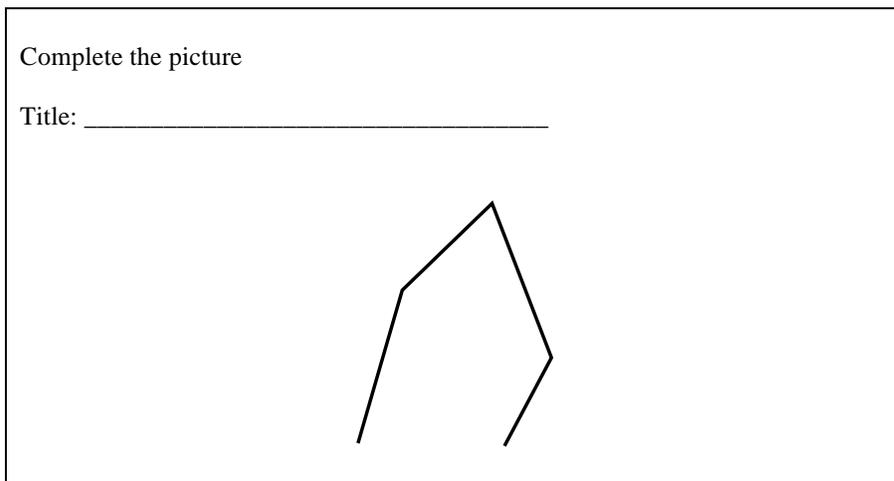


Figure 5.2: Example of the complete the picture drawing task 1

From the collected pool sample of drawings (n=173) over the two-year span, I equated the statistical uniqueness of the drawings (originality). I created a scoring criteria as

follows based on a 6-point scale for originality: 6 points = less than 0.6%; 5 points = 0.6% to 1.7%; 4 points = 1.8% to 2.9%; 3 points = 3.9% to 5%; 2 points = 5.1% to 10%; 1 point = over 10%. Table 5.7 shows the drawings categorized as tools, animals & insects, large made objects, small made objects, nature, food, and humans & ghosts along with the frequency of occurrence, percentage of occurrence and the originality score.

TABLE 5.7: PICTURE COMPLETION POOL OF DRAWINGS AND ORIGINALITY SCORING CRITERIA CATEGORY

CATEGORY	IMAGE	Frequency	%	Originality Score (5-point)
<b>Tools</b> 20.2%	Sword	11	6.4%	2
	Pens/Pencils	23	13.3%	1
	Compass	1	0.6%	5
	Pikachu	5	2.9%	3
<b>Animal &amp; Insects</b> 18.5%	Rabbit	8	4.6%	3
	Bird	1	0.6%	5
	Fish	3	1.7%	5
	Koala	1	0.6%	5
	Squirrel	1	0.6%	5
	Squid	3	1.7%	4
	Starfish	1	0.6%	5
	Turtle	1	0.6%	5
	Horse	1	0.6%	5
	Shark	1	0.6%	5
	Cockroach	2	1.2%	5
	Butterfly	2	1.2%	5
	Dinosaur	1	0.6%	5
	Fox	1	0.6%	5
	<b>Large Made Objects</b> 24.3%	House / Building	21	12.1%
Rocket		12	6.9%	2
Airplane		3	1.7%	4
Tunnel		2	1.2%	5
Bridge		1	0.6%	5
Tower		1	0.6%	5
Boat		2	1.2%	5
<b>Small Made Objects</b> 8.1%	Shirt	1	0.6%	5
	Origami	1	0.6%	5
	Ear Ring	1	0.6%	5
	Soccer Ball	1	0.6%	5
	Hat	1	0.6%	5
	Box	1	0.6%	5
	TV	1	0.6%	5
Game Catcher	2	1.2%	5	

	Book	1	0.6%	5
	Flag	1	0.6%	5
	Necktie	1	0.6%	5
	Baseball bat	1	0.6%	5
	Robot	1	0.6%	5
<b>Nature / Place</b> 17.3%	Crystals/ Diamonds	13	7.5%	2
	Flowers	4	2.3%	4
	Mountain Top	2	1.2%	5
	Sea	1	0.6%	5
	Camping	1	0.6%	5
	Snowman	1	0.6%	5
	Graveyard	4	2.3%	4
	Ice/Ocean	2	1.2%	5
	Star	1	0.6%	5
<b>Food</b> 1.7%	Banana	1	0.6%	5
	Cheese	2	1.2%	5
<b>Human &amp; Ghosts</b> 8.1%	Face	6	3.5%	3
	Person	7	4.0%	3
	Ghost	1	0.6%	5
<b>Other</b> 2.3%	Aomori	1	0.6%	5
	Bacteria	1	0.6%	5
	Heart	1	0.6%	5
	Egyptian Sphinx	1	0.6%	5
<b>TOTAL</b>		<b>173</b>		

In addition to the uniqueness or overall originality of the drawings, this creative product was also scored for overall creativity by a group of evaluators or judges. For instance, Figure 5.3 shows an example of 6 drawings taken from the pilot study. Each one has been scored for each of these two criteria using a 6-point scale. Again, originality was based on the above frequency table, while creativity was based on a cumulative score by 3 judges.

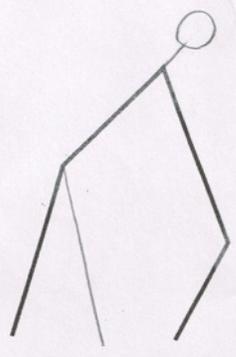
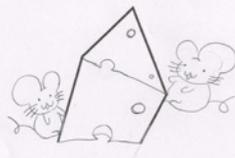
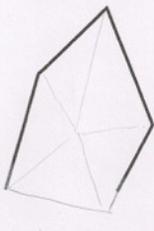
<p>Drawing 1: Rocket</p> <p>Title: <u>rocket</u></p>  <p>Originality: 2 Creativity: 5</p>	<p>Drawing 2: Space</p> <p>Title: <u>space</u></p>  <p>Originality: 2 Creativity: 10</p>	<p>Drawing 3: An Old Man</p>  <p>An old man.</p> <p>Originality: 3 Creativity: 13</p>
<p>Drawing 4: Mouses Eat Cheese</p> <p>Title: <u>MOUSES EAT CHEESE</u></p>  <p>Originality: 5 Creativity: 12</p>	<p>Drawing 5: The Tower that Sees Everything in the World</p> <p>Title: <u>The tower sees every thing in the world</u></p>  <p>Originality: 6 Creativity: 17</p>	<p>Drawing 6: Starfish</p> <p>Title: <u>star fish</u></p>  <p>Originality: 6 Creativity: 3</p>

Figure 5.3: Examples of scoring for the creative product: Drawing task 1

### Development of the Creative Product: Drawing & Ideational Fluency

The before mentioned creative drawing relies on originality and overall creativity, a second type of drawing similarly developed from the DT tests relies on ideational thought and fluency or the ability to come up with many drawings to fit a pattern, as well as, an overall creativity of the drawings. There are two types of possible tasks (as described in Chapter 4.1.1): one called *lines* where the participants receive a page with many lines that

look like X's and have to create as many images from these X's as possible and the other called *circles* where the participants receive a page with many circles that look like O's. Figure 5.4 is an example of a blank page from this form that was used in the pilot study (this has been condensed to only two rows though in the study the rows of "O's" covered the entire page).

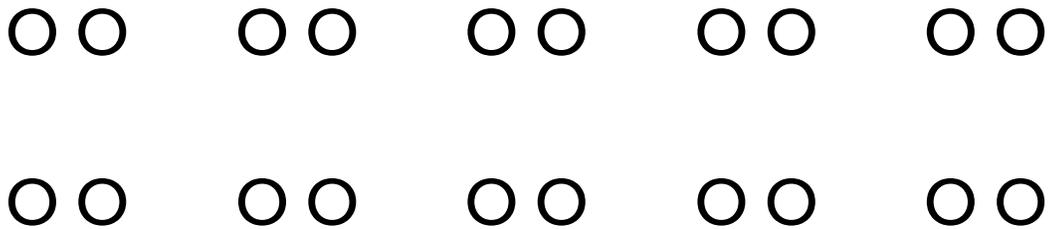


Figure 5.4: *Circles* figural task: Drawing task 2

In the pilot study participants were shown the *lines* form with drawings on it, as an example. Then they were told to come up with as many drawing as possible using the *circles* form. They had 15 minutes to complete this task. Figure 5.5 and 5.6 show examples from participants 3 and 6 in the pilot study.

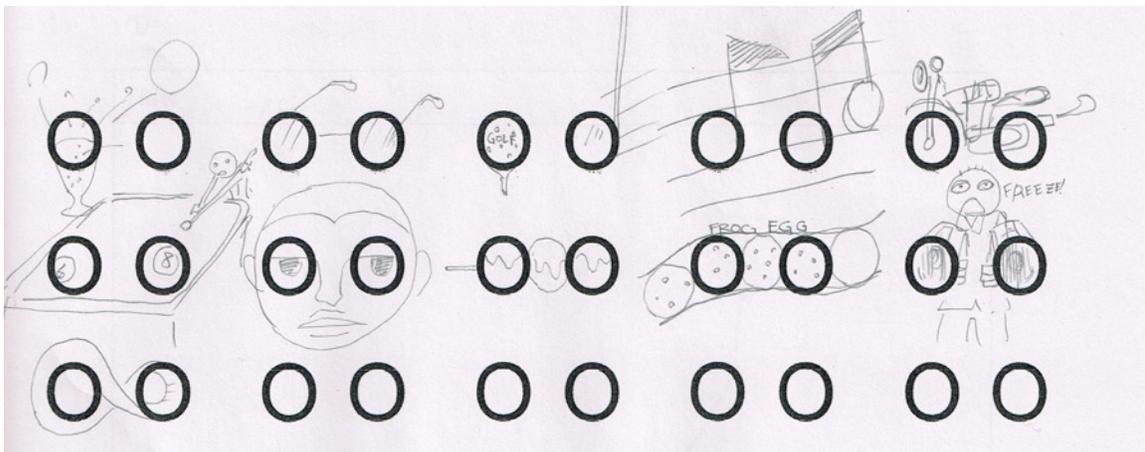


Figure 5.5: Drawing task 2: Participant 3 (pilot study)

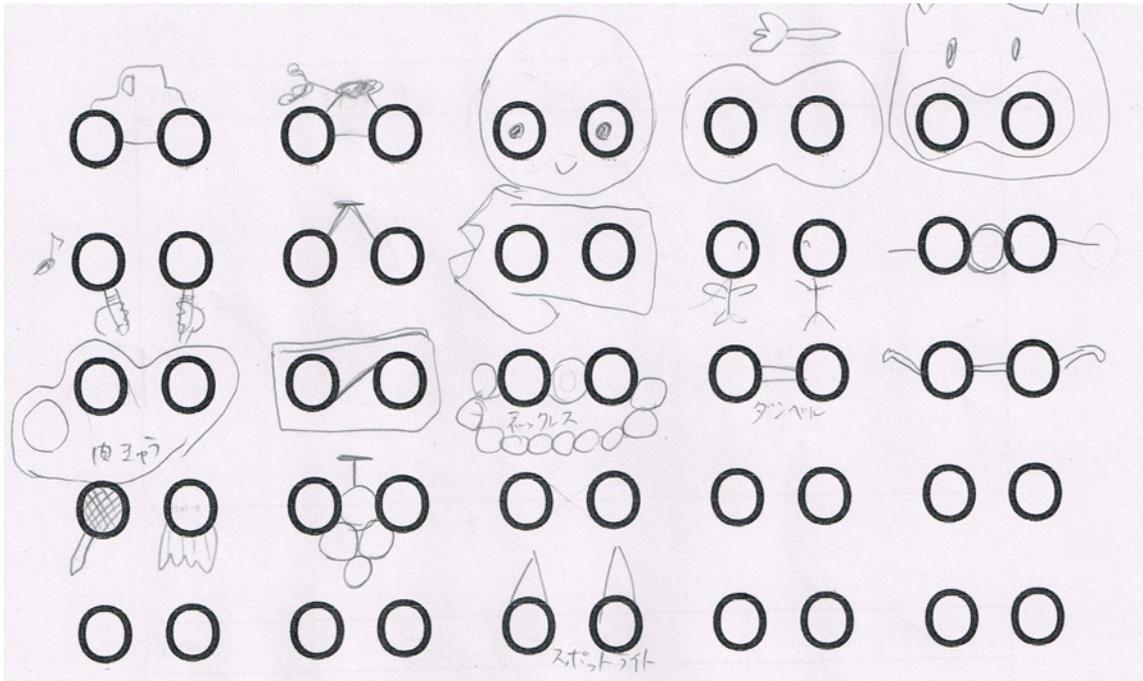


Figure 5.6: Drawing task 2: Participant 6 (pilot study)

Common drawings were wheels on a vehicle (e.g., car, bicycle), glasses, eyes, ears, nostrils, fruit (e.g., apples and cherries), and buttons on a shirt. These drawing were assessed using two criteria: fluency or the overall number of drawings and an overall consensual assessment of creativity by a group of judges, so similar to the previously mentioned set of drawings. For instance, participant 6 scored higher on fluency (19 to 11) but lower for overall creativity (9 to 14), as assessed by 3 judges on a 6-point scale. In summary, the main study used 3 creative products: a short (haiku-like) poem in Japanese and two drawing tasks.

### 5.3.3 SUMMARY: THE CREATIVITY INSTRUMENTS

This section has provided background to the development of the creative instruments used in the main study. I have shown that to grasp the complexity of creativity, it is

important to use multiple instruments that aim to measure different facets of this construct such as personality traits, past creative achievements, self-assessment of one's own creativity, and actually producing a creative product. Better understanding the varying components of creativity and the inter-relationships between them is in itself a worthwhile endeavor, but this thesis also aims to investigate *creative metaphoric competence*, and to examine if this ability shows up in both an L1 and an L2. In order to investigate this possibility, in the next section I discuss the development of a set of metaphor tasks used in this research that aims to assess *creative metaphoric competence* in both an L1 and L2.

#### 5.4 DEVELOPMENT OF THE CREATIVE METAPHOR PRODUCTION TASKS

In the previous section, I have outlined the instruments that I developed in order to measure the many different facets of creativity. In this section, I turn my attention to the different ways to measure metaphoric competence. First, I begin by discussing a metaphor recognition task that appeared in both the pilot and main study. Then I examine some initial tests that I developed and used in the pilot study and the shortcomings of them. Finally I discuss in greater detail, the two production tasks that I decided to use for the main study.

##### 5.4.1 THE METAPHOR RECOGNITION TASK

In order to familiarize the participants with the concept of “metaphor” and variations between conventional and novel metaphors in language, two versions of a Metaphor Recognition Task were developed in Japanese (L1) and English (L2). Although the

sentences in each of the two languages were different, the two sets included similar patterns of literal, conventional, and novel metaphorical sentences. Participants were asked to score each sentence from “1” being “a literal sentence” to “5” being “a conventional/everyday metaphorical sentence” to “10” being “a creative/novel metaphorical sentence”. They were provided the same example at the start of each task (the Japanese version was in Japanese). They were shown how to mark these sentences as indicated in Figure 5.7.

### An Example

- **EXAMPLE:**
  - In my case I would circle the following for the below sentences:
- |   |   |                         |
|---|---|-------------------------|
| <ul style="list-style-type: none"> <li>• <i>Their math professor is <u>old</u>.</i></li> </ul>                                  | ← | Literal sentence        |
| <ul style="list-style-type: none"> <li>① 2 3 4 5 6 7 8 9 10</li> <li>• Their math professor is <u>over the hill</u>.</li> </ul> | ← | A conventional metaphor |
| <ul style="list-style-type: none"> <li>1 2 3 4 5 6 7 8 9 10</li> <li>• Their math professor is a <u>fossil</u>.</li> </ul>      | ← | A novel metaphor        |

Figure 5.7: Examples from the metaphor recognition task

They were also told that such responses could vary from person to person and simply to respond how they felt towards each sentence for there are in fact no right or wrong answers. Table 5.8 lists the sentences used for the Japanese and English versions (see Appendix K to see the original Japanese version). Next to each sentence, the mean average from the pilot study is also included in this table.

TABLE 5.8: METAPHOR RECOGNITION TASK

<b>Japanese Version</b>		<b>Mean</b>	<b>English Version</b>		<b>Mean</b>
1.	Will you give me a hand?	4.0	1.	He has a sore back.	2.0
2.	The prison guard was not kind.	1.0	2.	The new student's mind is a sponge.	6.29
3.	The cave painting is ancient graffiti.	3.86	3.	Traffic here is terrible in the summer.	3.43
4.	The contract is a handcuff.	8.57	4.	The nurse's touch was medicine.	7.0
5.	The wind blew all through the night.	1.29	5.	She has a lot of emotional baggage.	6.71
6.	Now the yen is sharply falling.	4.0	6.	Unfortunately his attitude is a cancer.	8.86
7.	His dream vanished.	5.0	7.	Failing the test was a blow to his confidence.	6.14
8.	His new book received a showering of criticism.	4.71	8.	During the troubling times, his wife was his anchor.	7.14
9.	Tokyo Skytree is high.	1.0	9.	Their friendship is crumbling.	5.57
10.	His lecture is sleeping medicine.	9.0	10.	The economy is on the edge.	5.43

The scores on the Japanese version are as expected. Participants clearly distinguished conventional metaphorical expressions like talking about the value of a currency in spatial terms, as in, falling and rising and another common metaphor in Japanese is to describe criticism as a “shower” from more novel metaphors like describing a contract as a “handcuff”, which scored very high (8.57). The literal expressions were accordingly scored very low (1.0, 1.29, 1.0). On the other hand, participants scored the English version similarly, but the stark contrast is not as apparent, which might indicate more doubt and uncertainty such as scoring, “Traffic here is terrible in the summer” relatively high (3.43), which is comparable to the Japanese expression, “The wind blew all through the night” (1.29). The point though for this exercise was to help the participants to become more aware of metaphors in both languages and to show them how some metaphors are viewed as being more “conventional” and others more “creative”. At the end of this section in both the pilot and main study, I also indicated that

the goal of this research was to respond creatively to the followings metaphor tasks. So in short, this exercise acted like a primer for the ensuing tasks and also aimed to raise their awareness of metaphors in language and to reiterate that the goal of this research was to produce creative and novel metaphorical responses.

#### 5.4.2 MEASURING METAPHORIC COMPETENCE: INITIAL SHORTCOMING

In this subsection, I describe the varying shortcomings and inadequacies of my initial metaphor production tasks. Again, the goal of these tasks was to be able assess to a certain degree one's metaphoric competence in both an L1 and L2, especially in regards to creative metaphor production. Similarly to measuring a creative product, priming participants to create novel metaphors is a complicated task. As I have mentioned throughout this thesis, my goal was not to evaluate their ability to understand or use conventional metaphorical expressions in context, but to look more closely at their ability to produce their own creative metaphors that are both meaningful and novel. Despite this intention, the various instruments that I initially designed often failed to capture the creative aspect of metaphors. For instance, in one task the participants were asked to complete a triad of words or expressions with an associated emotion like the following example:

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hit the roof	steam	boil	.....
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In the above example, the emotion commonly associated with these words is anger. Yet what I realized is that this type of task mostly tested the depth of their semantic knowledge of various words and not their creative ability to produce novel metaphors. So this task was too narrow and constraining and subsequently I needed to develop

something more open-ended that allowed for a wide range of responses. In the next part, I specifically look at two examples of tasks that I had in the pilot study, but also were not used in the main study and I describe why I did not include them.

### Examples from the Pilot Study

One task that I experimented with in the pilot study required the participants to produce as many adjectives as possible to replace the adjective in a conventional expression like “the picture is (colorful)”. Benedek and colleagues (2014) used a similar approach to this (as described in Chapter 3.5.2). In this example, possible responses are “a rainbow”, “a wing of a pressed butterfly”, “a box of crayons”, “a garden in full bloom” and so on. Viewing this example, it seems that this could be a promising task to assess creative metaphor production, but a few problems emerged. First, other common adjectives that I used in this task like “big”, “smooth” or “hard” have a limited possible range of responses. How many different ways can one metaphorically extend the adjective “smooth”? So the participants’ responses to items in this task were minimal and a number of them actually did not provide any responses to a few of the adjectives. The second problem is that this task likely directs the participants’ attention to focus more on attributional metaphors or metaphors that rely on mere appearances (e.g., the snake is a river) or physical similarity. For example, for the prompt “the bread is (hard)”, many participants responded with the word “rock”. A rock is likely one of the more common exemplars for the category, “objects that are hard”. Attributional metaphors are less cognitively demanding and appraised as less interesting (see Chapter 2.3.1 & Gentner, 1988), as compared to relational metaphors and therefore this task did not seem appropriate for this study. Moreover, since the participants usually provided few and

similar responses for each adjective, thereby limiting the variance between the subjects' scores, I concluded that it was probably not a reasonable way to measure *creative metaphoric competence*.

A second example of a task that I tried to develop and used in the pilot study, but failed to produce any meaningful responses from the participants is a modern version of the Metaphor Triads Task (Kogan, Connor, Gross, & Fava 1980). The goal was to assess the participants' ability to combine visual stimuli together in metaphorical ways. Similar to Kogan and colleagues (1980), I used three images. Two pairs of these images could literally be combined while the third pair could be metaphorically combined. For instance in one example from the pilot study, there was the following triad: a bird, a violin and a tree. The bird and tree could be paired to express the literal expression, "The bird is in the tree". The violin and tree could be combined to express the literal expression, "The violin is made of wood." The third also could be metaphorically combined to express the similarity between a bird singing and the music of the violin. Nevertheless in an attempt to bring another mode (in this case the visual) into one of the metaphor tasks, this task failed to produce any measurable data in the pilot study. This could possibly be due to the fact that the task itself forced the participants into producing a conventional metaphor that the researcher had already designed into the set of pictures. So in actuality, similar to the before mentioned set of three words that aimed to prime the participants to produce an emotion, this task also overly constrained them to respond in a very limited and constricted way.

In response to these shortcomings, I then decided that the metaphor tasks had to be open-ended enough to allow the participants the freedom to produce their own metaphor, while at the same time appropriately structured in order to prime them to actually produce a metaphor. Consequently, I decided to rely on two variant tasks: one is contextually independent and the second is contextually dependent. I go into more detail about each of these in the next section.

#### 5.4.3 CREATIVE METAPHOR PRODUCTION TASKS USED IN THE MAIN STUDY

In this final part of this section on the development of the metaphor tasks, I describe in detail the two tasks that were used in the main study. These are called and “The Context Independent” and “Context Dependent” metaphor tasks.

##### ① The Context Independent Metaphor Task: The Copula (A is B)

Finding a task that is both suitably open, allowing the participant to create a novel metaphor, and at the same time sufficiently constrained, allowing the researcher a degree of control, is a tremendous challenge. In the end, simplicity is perhaps the best option. One type of task used in the main study was the context independent metaphor task based on the copula A is B. Independent, insofar as there is no context to the metaphor, but rather the participant is simply provided a topic or the “A” part of the metaphor and asked to provide a source or the “B” part of the metaphor and then to interpret the meaning of it. In the following part, I first discuss the pilot study version of this and then the revised version, which was used in the main study. After that, I provide the rationale for

including this task in the main study as a way to measure *creative metaphoric competence*.

### Lessons from the Pilot Study

In the pilot study, participants were asked to produce a nominal metaphor using a copula (A is B) format. For example, the participants on the English version received the following nominal metaphor:

- College is a garden.

They were then provided with the following interpretation of this metaphor:

- **Interpretation:** *While attending college students grow a lot like plants grow in a garden. Rain and sunshine are like knowledge. Rain and sunshine help plants grown while knowledge helps students grow. In a garden there are many different types of flowers and also at college there are many different types of people.*

They were provided two topics in each language (English: “Life is ... ” and “Memories are ...”; Japanese: “Love is ...”, and “Looking for a job is ...”). I provided one metaphor example for each of the topics. For example, for the Japanese topics, I provided the following examples: “Love is a rollercoaster” and “Looking for a job is being lost in a maze”. For each of the metaphors provided by the researcher, they were then asked to interpret what they thought these metaphors meant. Then they were asked to come up with their own metaphors and subsequent interpretations of them. By providing them these initial examples, I thought it would prime them to more easily produce their own metaphors.

A number of issues arose in the pilot study in regards to this task. Firstly, the layout was too complicated and the directions too confusing. Secondly, by providing the participants with an example metaphor using the topic likely constrained their thinking about the topic. Taking these considerations into account, for the main study I made a few modifications. Firstly, I removed the example metaphors. Secondly, I changed the format to something that more closely resembles the creative process that includes both ideational fluency and evaluation. So in the main study, the participants were provided a topic like “college” and then asked to come up with as many metaphors as possible that could be used to describe this topic such as: College is a garden; College is a party; College is doorway; College is madness; College is freedom; College is homework; College is a mirror; College is flying. This is in fact a type of divergent thinking task, so ideational fluency is crucial. Yet in contrast to DT tasks, the creative process involves another crucial stage, an evaluative stage of reflecting on the items and judging the one that is most appropriate. Therefore they were then asked to evaluate this list of metaphors that they had just produced and choose only one that they believed in their viewpoint was the most novel and meaningful. Finally they were asked to provide an interpretation of it.

#### The Context Independent Metaphor Task: A Creative Process

In order to provide some rationale for choosing this task for the main study, first I need to return to a quote that I mentioned earlier in this thesis, “the value of research on metaphor lies in the fact that metaphor shows on a small scale all the principal features of the thought processes that are most significant in creativity” (Miall 1987, p. 82). This metaphor task clearly shows on a small scale similar thought processes to creativity. For instance, the creative process proposed in the literature encompasses four phases:

problem analysis, ideation, evaluation, and implementation (Zeng et al., 2011). In a similar way, the above metaphor task requires similar phases in order to complete it. Figure 5.8 provides a visual model of this process. First one has to analyze the topic and access one’s conceptual knowledge of this concept and then use divergent thinking or ideation to think of many possible vehicles to complete this metaphor in a meaningful and novel way. After that, one must evaluate this list and determine which one is most apt based on it being both novel and meaningful. Finally one then needs to provide an interpretation of this metaphor.

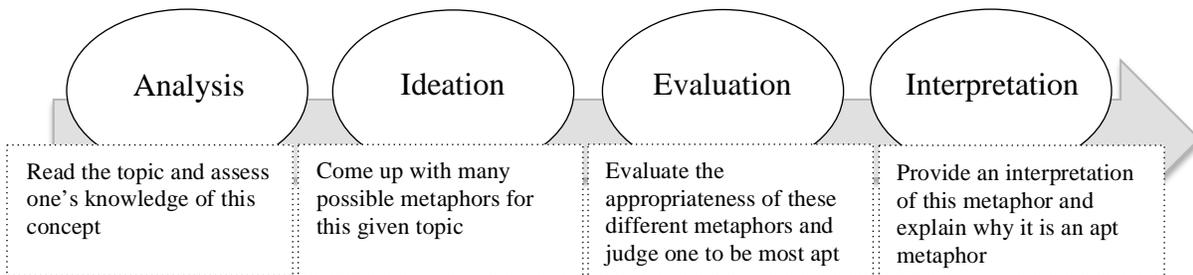


Figure 5.8: The metaphor process for producing/interpreting a nominal metaphor

A slightly alternative way to approach this process is to view it using a conceptual model as seen in Figure 5.9. In this model, the written stimuli, which in this case using the example provided above, is “College is...”, enters the sensory system through the visual mode. One first has to identify that this writing is indeed a recognizable linguistic code (as opposed to Arabic to a non-Arabic speaker). Since this written code is without context and the task asks the participants to produce a creative metaphor to complete it, the representational system for this concept becomes active, which includes semantic knowledge, autobiographical knowledge, and associational structures for this concept.

*Creative metaphoric competence* ensues as the participant seeks combinatorial possibilities that may complete the metaphor in a meaningful and creative way.

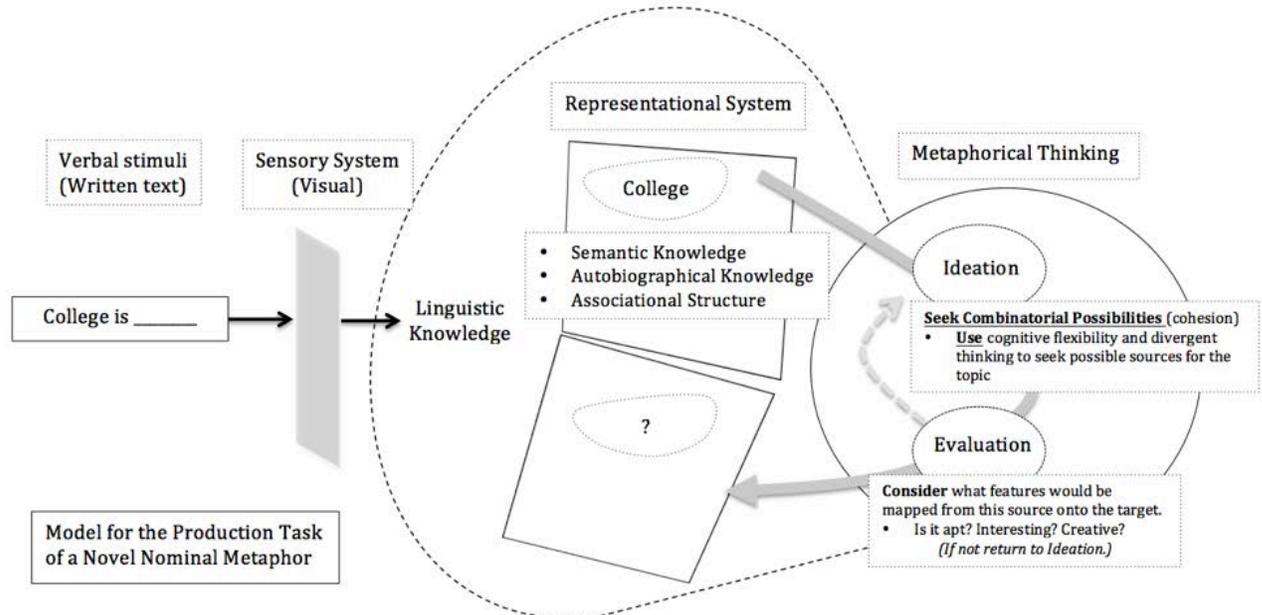


Figure 5.9: A conceptual model of the process to produce a response for the context independent metaphor task

Once one has exhausted all the possible combinations, one then evaluates the best possible response by considering what features would be mapped from this source onto the topic. This likely happens somewhat unconsciously and by asking oneself the question, how interesting and appropriate is it? Interest or pleasure arises from the combining of two concepts that are semantically distant, but at the same time, they allow for the recoverability or discovery of certain shared features. The more unexpected or surprising these shared features are, the greater the interest or pleasure (see Wimmer et al., 2016 for a discussion on non-conventional figurative language and emotional aesthetic appreciation). This task requires one to seek out possibilities and then choose the best one and finally provide reasons for this choice. One of the challenges to these

creative metaphor tasks is to develop a way to measure these responses, which I address in the next section.

### Assessing the Context Independent Metaphor Task

In the previous part of this section, I discussed the creative process required to complete the context independent metaphor task. The question that then arises is; how can one reliably evaluate these responses? Tests that aim to measure metaphoric competence that are based on conventional metaphors rely on similar methods as traditional vocabulary tests whereby there are right and wrong responses. In contrast, this instrument aims to measure the creative side of metaphor production and therefore assessing the responses are less objective and therefore require some consensual input. In order to do this, a group of evaluators scored them based on a simple criterion, “is the response creative?” In order to minimize the ambivalence in the scores, a simple 3-point scale was developed. Using a wider scale (e.g., a 5-point scale) would entail being able to qualitatively explain the difference between giving one response 4-points and another 5-points and this could be problematic. To eliminate this possibility and provide the evaluators a clear guide, I adapted scales used in previous studies (Beaty & Silvia, 2013; Littlemore 2001a, 2010; Silvia and Beaty, 2012) and used the following evaluation criteria:

- **1 – *Not creative*** > literal, not appropriate, or highly conventional responses
- **2 – *Somewhat creative*** > extended conventional responses
- **3 – *Creative*** > surprising and novel responses

*(When rating these metaphors one should consider the following points: A creative metaphor involves novelty and originality, remoteness/distance between the two concepts, an element of surprise, and aesthetic appreciation. On the other hand, a non-creative response uses language that is highly conventional or even literal, familiar, and not surprising, and involves minimal cognitive effort to understand.)*

In addition to the above “creative” score, this task also had a second score based on the sheer number of metaphors the participant created, which was labeled, the “fluency” score for this task. So in brief, this *context independent task* has two scores, a consensually assessed creative score and a tallied fluency score. In the next section, I discuss a contrasting task or the second set of creative metaphor production tasks used in the main study called the *context dependent task*.

## ② The Context Dependent Metaphor Task: Complete the Sentence

Along with a *context independent metaphor task*, I also included in the main study, a *context dependent metaphor task*. These sentences were similarly constructed, as those found in Littlemore’s (2010) study, which used two sets of sentence starters (one in English and one in French) to test original metaphor production. These sentences provided the participants a starting context that they then needed to creatively complete. Each sentence primes a certain topic based on the contextual cues within the sentence. For example, the following sentence from the Japanese version primes the topic of “Disappointment”.

- His parents had many expectations that their son would be successful, so they got him into an expensive private university. But rather than studying hard, he began to party every night and in the end he had to drop out of school. His parents dream (\_\_\_\_\_).

Due to the length of the sentences, there are a number of linguistic constraints to this task. First, it requires the participants to comprehend a full sentence. Moreover one needs to overcome the ambiguity of the incomplete part. In addition, one needs to have the linguistic skills to complete the sentence in a meaningful way. This requires

understanding the grammatical structure of the sentence. In the pilot and main study, there were five context dependent metaphor-priming sentences in each language (see Table 5.9 for the full list). In order to develop these sets of sentences in the two respected languages, I first compiled a set of topic ideas that could be used to prime the participants to produce a metaphor. Then I worked and consulted with a Japanese university student research assistant who helped me compose these sets of sentences in the two languages, and to provide insight and advice into choosing culturally appropriate themes that are familiar to Japanese university students (i.e., school, music, looking for a job, being in debt, disappointing one's parents, falling in love, and an angry teacher).

TABLE 5.9: A COMPLETE LIST OF THE SENTENCES IN THE CONTEXT DEPENDENT METAPHOR TASK: ENGLISH AND JAPANESE VERSIONS

<b>English</b>	<b>Japanese</b>
<p><b><i>Prime: Recalling a memory is</i></b></p> <p>1) In writing class, Mary has been told to look into her past and (____) some of her memories for there is a lot of good drama there.</p>	<p><b><i>Prime: A beautiful voice is</i></b></p> <p>1) She has a beautiful voice. Whenever I hear her voice, I imagine (____).</p>
<p><b><i>Prime: A burden (debt) is</i></b></p> <p>2) After graduating from university, he has not been able to find a job. But still he bought a new car and a lot of new clothes. Now he has a lot of credit card debt and worries. He (____).</p>	<p><b><i>Prime: Nervousness/Excitement is</i></b></p> <p>2) A friend asked her to give a speech at her wedding reception, she (____).</p>
<p><b><i>Prime: A large group of people are</i></b></p> <p>3) Yesterday in Odaiba, AKB48 came to sign autographs for their fans. There were so many people waiting outside and when they finally opened up the gate to let the fans approach the tables, (____).</p>	<p><b><i>Prime: Disappointment is</i></b></p> <p>3) His parents had many expectations that their son would be successful, so they got him into an expensive private university. But rather than studying hard, he began to party every night and in the end he had to drop out of school. His parents dream (____).</p>

<p><b>Prime: Anger is</b></p> <p>4) The school festival was suppose to be a fun occasion, but when the teacher saw the students painting on the walls he got really angry. He (____).</p>	<p><b>Prime: An unforgettable experience is</b></p> <p>4) It was really exciting for I was competing against the top-level skaters in the world in the Olympics. So I will never forget this experience. This experience (____).</p>
<p><b>Prime: Falling in love is</b></p> <p>5) I met this really great girl/boy last night. We went out and had a great time. When I got home I couldn't sleep. She/he really (____).</p>	<p><b>Prime: Happiness/Pride is</b></p> <p>5) When I passed the university entrance exam, my parents (____).</p>

Establishing a way to assess these responses is a key part to developing this instrument.

In the next part, I approach this in a similar way to the *context independent task*, but also consider the differences between these two tasks and the need to slightly alter this assessment.

#### Assessing the Context Dependent Metaphor Task

Assessing the *context dependent metaphor* task is slightly different than assessing the *context independent task* because of the greater reliance on linguistic knowledge in the former task (i.e., having to read an incomplete sentence in the L2, as compared to having to read a single word). For instance, the first sentence item in the English set (E1) primes the respondents to think about recalling a memory. The part that needs to be filled in requires a verb for grammatical accuracy. In the L1, this is rather elementary, but in the L2 this adds an additional layer of complexity in order to complete. Responses could vary between literal verbs like “think about” or “remember”, to more conventional metaphors like “dig up” or “pull out”, to more novel ones like “paint” or “harvest”. These examples are relatively straightforward to assess, but participants who provided a metaphor (based on the topic “memories”), but not the correct grammatical form to fit the pattern of the

sentence, obviously may cause some difficulty to assess. For example, in the pilot study, one participant provided the noun “jewel” to complete the sentence, which is grammatically ambiguous (i.e. “look in her past and jewel some of her memories”), but conceptually is appropriate (i.e., “memories are jewels”). Accordingly this was an issue that needed to be addressed when assessing the responses in the main study.

Consequently, in contrast to the *context independent task*, which is assessed through a cumulative score based on a group of evaluators, this task initially was assessed by the researcher and then discussed and modified or confirmed with a second evaluator. The second evaluator was a native English or Japanese speaker, respectively.

In order to provide some structure to assessing these responses, a set of criteria was developed. Returning to the above five sentences, in the first one from the Japanese set, the participants were asked to complete a sentence that primes the topic, a beautiful voice. Looking at the responses from the main study, there were four possible categories of responses: not creative (“Mariah Carey” – comparing a beautiful voice to someone who has a beautiful voice – often these are literal, predictable, and tightly associated with the topic concept), somewhat creative (“an angel” – comparing a beautiful voice to some imagined entity – these are typical responses and often are considered conventional metaphors), somewhat creative (“after completing difficult homework, that moment being praised for doing it when submitting it to the teacher”- these are less common in the pool of responses, but do not seem terribly appropriate), and creative (“beads scattered on white drawing paper” – comparing a beautiful voice to another mode, the visual, in the form of some artistic expression – these are both novel and apt responses and the relations between the two concepts are distant). Therefore this set of criteria

added an additional score on the scale, as compared to the context independent task. This was deemed necessary to add after looking through the responses for there seemed to be one additional category of responses that were creative, but lacked the element of surprise, aesthetic appreciation, or appropriateness. Each of these sentence completion tasks were then assessed using this format:

- **1 – *Not Creative*** > highly predictable, tightly associated with the topic, highly conventional metaphorical or literal response, and common response among the participants
- **2 – *Somewhat Creative*** > not as common of a response, a conventional metaphor, but slightly more creative
- **3 – *Creative (novel)*** > unfamiliar, unconventional, novel response, but not completely appropriate or hard to find meaning in it
- **4 – *Creative (novel + appropriate)*** > unfamiliar, unconventional, novel response, surprising, and also appropriate and meaningful – vivid and has good imagery

In the *context independent task*, every participant provided a response, but in this task, a few participants did not provide any response, especially in the English version.

Therefore, a “0” point was also required for these blank responses.

#### 5.4.4 SUMMARY: THE CREATIVE METAPHOR PRODUCTION TASKS

In this section of the chapter, I have discussed the course of developing various metaphor tasks, which eventually, I narrowed down to two types of tasks: a context independent one and a context dependent one. The former resembles the creative process that measures both ideation or fluency and overall creativity of the response, which is comprised of both a metaphor and an interpretation of it. The latter task is more heavily

dependent on the language and context of the sentence, which required the participants to complete the unfinished part of it. Table 5.10 outlines the metaphor tasks that were used in the pilot and main study.

TABLE 5.10: METAPHOR TASKS USED IN THE PILOT AND MAIN STUDY

<b>Pilot Study</b>	<b>Main Study</b>
Expand the adjective in the sentence with a metaphor	*Not included <ul style="list-style-type: none"> <li>• Too limiting in the number of possible responses</li> </ul>
Metaphor Triads Task - Visual Mode	*Not included <ul style="list-style-type: none"> <li>• Confusing, few responses by participants, constraining</li> </ul>
Context Independent Metaphor Tasks	Context Independent Metaphor Tasks <ul style="list-style-type: none"> <li>• Modified version – made it simpler and clearer to understand</li> </ul>
Context Dependent Metaphor Tasks	Context Dependent Metaphor Tasks <ul style="list-style-type: none"> <li>• Unchanged</li> </ul>

## 5.5 SUMMARY OF CHAPTER 5

In this chapter I have provided background on the various instruments that have been developed and used for the main study. Both the creativity instruments and the creative metaphor production tasks went through major alterations through initially using them in an informal classroom setting through to a more formal pilot test and finally into the versions that were used in the main study. The goal was to measure the different facets of creativity and *creative metaphoric competence* in the individual participants. It might be advantageous now to briefly return for a moment to the questions posed in this thesis. First I aimed to explore the relationship between an individual's *creative metaphoric competence* in an L1 and an L2. It is hypothesized that the individual's preference for novelty will appear in both the L1 and L2. That is to say, when a participant is confronted with these metaphor production tasks and has to respond within a limited time frame, one

approach is to rely on salience (Giora, 2003) or what comes to mind easiest and with the least amount of cognitive effort, yet obviously this is not always the case. As mentioned in Chapter 3, the fine-coarse semantic processing model (Jung-Beeman, 2005) could explain such a difference among individuals. For instance, some people may rely more heavily on fine-grained semantic processing, often associated with processing literal language, but more specifically highly conventional and familiar language. For example, when confronted with the context independent metaphor task, they may simply provide a response that is semantically close to the topic, in this sense, a literal or conventional response while others may recruit coarser semantic processing in order to seek out connections between more distantly related semantic concepts. So the question is, does this preference or inclination for novelty and using coarser semantic processing appear in both languages?

The second question addresses the creativity instruments and the role that creativity plays in the production of novel metaphors in an L1 and L2. It is assumed that novel metaphor production requires a number of similar personality traits found in creativity research like risk taking, curiosity, tolerance of ambiguity, and openness (especially to possible alternative meanings to words), and persistence. So it is hypothesized that scores on the creative personality questionnaires should have some correlation to the scores for the creative metaphor production tasks.

## **Chapter 6 Main Study: Methods and Assessment of the Creativity Instruments and Creative Metaphor Production Tasks**

In this chapter the process of analysis and descriptive statistics are reported in detail along with the raters' assessments of the productive creativity and metaphor tasks. In the following chapter (Chapter 7), I then present the inferential statistics and discuss the results from the main study. Throughout this thesis it has been suggested that metaphoric competence needs to be further classified as either being competent with conventional expressions that are used in everyday language or being competent in producing creative metaphors. In the former case, depth and breath of vocabulary knowledge in the given language is necessary and thus highly contingent on linguistic skills. The latter relies more on ideational fluency and combinatorial abilities linking distantly related concepts together. If this is the case then it is hypothesized that this form of metaphoric competence might be an individual difference or the proclivity towards novelty and uniqueness whether or not using an L1 or L2. Consequently, in order to investigate this, it is necessary to first look at ways to measure *creative metaphoric competence* in both an L1 and L2 and then look at the relationship between them. Moreover it is hypothesized that various measurable features of creativity such as personality, past creative achievements, self beliefs in one's creativity and actually producing a creative product may also be related to *creative metaphoric competence*.

In this chapter, I describe in detail the main study. First, I begin by describing the student participants. Then I review the instruments used in this study, which summarizes the material developed in the previous chapter. Next I discuss the methods used to collect the data. Afterwards, the main focus of this chapter explores the reliability of the instruments in the main study and provides an outline of how I assessed and coded the participants' responses. In short, the latter part of this chapter primarily focuses on the process of analysis of the data and provides descriptive statistics to the various measurements collected in the main study.

## 6.1 PARTICIPANTS

The participants in the main study (n=130) were Japanese university students in northern Japan with Japanese as their first language (L1) and English as a foreign language (L2). There was a relatively even distribution of males (n=60) and females (n=70). Of these 130 participants, 116 completed all the sections of the research. I did not ask the participants to provide their age, but they did provide their class grade and faculty. At the time the participants completed the research, a large majority were 1<sup>st</sup> year students, but since it was open to all students, a few 2<sup>nd</sup> and 3<sup>rd</sup> year students joined and a very small number of 4<sup>th</sup> year students also participated (4<sup>th</sup> year students, n=9; 3<sup>rd</sup> year, n=14; 2<sup>nd</sup> year, n=27; 1<sup>st</sup> year, n=80). The participants came from the various faculties at the university, but a majority came from the faculties of Medicine and Humanities (Medicine n=69, Humanities n=35, Agriculture =11, Science & Technology n=11, Education n=4).

### 6.1.1 ENGLISH LANGUAGE BACKGROUND

The participants had all studied English as a foreign language for a minimum of seven years (3 years in junior high school, 3 years in high school, and 1 year in university)<sup>12</sup>. Although these participants were by no means bilingual, each student had had a relatively similar and significant background experience with the English language. In terms of English abilities, as measured by a standardized English test, I asked the participants to provide any test score on a common standardized test like the TOEIC or TOEFL. 103 participants provided either a TOEIC score or a G-TELP score. G-TELP is a standardized test that had been recently implemented at the university and these scores were then converted into an equivalent TOEIC score based on a conversion table provided by the university. The average TOEIC score of these 103 participants was 699 with a wide range from 310 to 920. This level is roughly comparable to the B1 Threshold level or an overall intermediate level of English ability with a few outliers on both sides (A2 and B2).

In addition to these standardized tests, the participants also completed a vocabulary test. This test, as outlined in the previous chapter, is a condensed version of Paul Nations and David Beglar's "Vocabulary Size Test" (2007). The aim was to provide another measure to assess the participants' English abilities. This test was a 70-item multiple-choice test and the average score of the participants in the main study was 43 (range Low=30 High=54). In short, the student participants had some variation in their English abilities, which might have affected their capacity to respond to the English

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<sup>12</sup> English is a required course for all junior and senior high school students in Japan and also is a required course for 1st year university students at the university where the research took place.

metaphor tasks, especially the *context dependent task* that requires them to comprehend a longer contextualized sentence in the L2.

### 6.1.2 RECRUITING THE PARTICIPANTS

During the months of November and December of 2015, student participants were recruited through flyers and posters and word of mouth. This was predominantly done in and around the language-learning center at the university. They were clearly told that the research would take 2 hours to complete and they would receive compensation for their time based on the university regulations for employing students in research-based projects. Despite these efforts to recruit students and the monetary incentive for participation, few students (n=46) took the initiative to participate in this study. In order to increase the number of participants, I recruited students (n=84) directly from English classes in the spring term of 2016. In this case, I asked the students to participate in order to assist me in completing a research project, but explicitly told them that this was not a requirement for the class and that participating or not participating in this research would not have any influence on their final grades for the class.

### 6.1.3 ETHICAL CONSIDERATIONS

All student participants were presented with and completed a consent form that explained in detail the research goals, the tasks involved in this research, and an explicit statement clarifying that all data collected would remain anonymous (see Appendix A for the Japanese version of this consent form with an English translation of it). I also informed them that participating in this research was voluntary and they could withdraw at any time. As a consequence, as mentioned above, 14 students or about 11% of those who

began the study did not fully complete every section. The students were informed that since this study was anonymous, any formal feedback could not be provided, but if they were interested in this research, they could inquire afterwards with me and I would provide more details about the results.

In addition to the abovementioned student consent form; I also received verbal permission to conduct this study with students at the university both from the professor in charge of my department and the office staff who took care of the paperwork, especially in regards, to providing students compensation for their time. My research proposal also went through the ethical review board at the University of Birmingham and was approved in order to commence the research project.

## 6.2 MATERIALS

In Chapter 5, I provided a detailed outline of the development of the instruments used in the main study. To briefly review, the first main goal of this study was to address *creative metaphoric competence* in both an L1 and L2 through evaluating the creativity of metaphor production on two varying sets of metaphor tasks. The second main goal of this research aimed to assess individual differences in creativity as measured through using a set of questionnaires that evaluated participants' personality, past creative achievements and self-appraisal of one's own creativity. In addition, a verbal and figural creative product was also collected from the participants. Finally I explored how these individual differences in creativity related to one's *creative metaphoric competence* in both the L1 and L2. I briefly review the instruments used in this study in the following subsections.

### 6.2.1 THE CREATIVITY INSTRUMENTS

In order to approach the complex and often elusive construct of creativity, a number of instruments were developed with the aim of approaching it from multiple different perspectives. This included using questionnaires and having the participants produce an actual creative product. Table 6.1 provides an outline with the measurement aims for each of the instruments used to measure creativity.

TABLE 6.1: OUTLINE OF THE CREATIVITY INSTRUMENTS

<b>The Creativity Instruments</b>	<b>Measurement Aim</b>
The Questionnaires (4)	<b><i>16-Item FFM-CPQ</i></b> A reduced five-factor model questionnaire based on Japanese university students' assessment of personality traits crucial for a creative person
	<b><i>24-Item CPQ</i></b> A questionnaire that encompasses a wide range of creative personality traits like tolerance of ambiguity, curiosity, and motivation
	<b><i>34-Item Past Creative Achievements</i></b> Past creative achievements in a number of different domains with the underlying assumption that past creative achievement is predictive of future creativity
	<b><i>24-Item Creative Self-Beliefs</i></b> A self assessment of one's own creativity in a number of different domains with the underlying assumption that creative people are aware of their own creativity
The Creative Production Tasks (3)	<b><i>Drawing 1</i></b> A complete the drawing task that aims to measure originality or statistical uniqueness and overall creativity
	<b><i>Drawing 2</i></b> A complete the drawing task that aims to measure ideational fluency by counting the total number of drawings and overall creativity of the drawings
	<b><i>Poem</i></b> A short written composition in the format of a Japanese "haiku" or "tanka" that aims to measure verbal creativity

This is by no means an exhaustive set of instruments that could have been used to measure creativity. I should take some caution in using this word as a noun (see Runco, 2008) and should probably refer to these instruments as attempts to measure creative personality, creative past achievements, creative self-beliefs and creative products, but not creativity, as some overarching individual trait. Moreover, one may notice from this list that it does not include divergent thinking (DT) tasks, which are often used to measure creativity in the literature, but this instrument has also come under a lot of criticism for conflating divergent thinking with creativity (see Cropley, 2006 & Sawyer, 2006). In short, as Piffer (2012) has poignantly expressed “DT tests cannot be considered measures of creativity, as they neither assess one's lifetime creative output (person's creativity) nor the creativity of a product” (p. 260). Another major criticism of divergent thinking tests is the overreliance of them on originality and fluency and their neglect of appropriateness (Zeng et al., 2011). Appropriateness or sometimes referred to as value or relevance along with novelty are the two standard characteristics of creativity (Amabile, 1983, Boden, 2004; Ward, Smith, & Finke, 1999). Therefore DT tests were not included in this study. Alternatively, this study used a diverse set of instruments that measured different facets deemed important for creativity in order to produce a more comprehensive assessment of it.

### 6.2.2 THE CREATIVE METAPHOR PRODUCTION TASKS

The metaphor tasks used in this study consisted of two different metaphor production tasks. Table 6.2 provides an outline with the measurement aims for each of these tasks.

TABLE 6.2: OUTLINE OF THE METAPHOR TASKS

Metaphor Tasks	Measurement Aim	
The Context Independent Task (2 topics/L1, L2)	<i>Metaphor fluency</i>	A metaphor task that aims to measure the ability to find multiple associations to a certain topic prompt
	<i>Creative metaphor production</i>	A metaphor task that aims to measure the ability to produce a creative metaphor and provide an interpretation of it for a certain topic prompt
The Context Dependent Task (5 sentences/L1, L2)	<i>Creative metaphor production</i>	A metaphor task that aims to measure the ability to produce a creative response that is embedded within a longer sentence prompt.

As noted in the previous chapter, the context-independent task required the participants to seek out various ways to complete a metaphor by providing a source for a given topic and then choosing the most creative one from this list and providing an interpretation of it.

This process intends to reflect the creative process on a small scale, from ideation to evaluation and then analysis or in the case of this metaphor task, interpretation (see Zeng, et al. 2011 for an in depth evaluation of the different parts of the creative process).

However, the *context dependent task* relied more on language and the ability to interpret meaning from the sentence in order to produce a novel and appropriate response to complete the sentence. In contrast to the creativity instruments, which were all completed in the L1, these tasks had two versions, one in the L1 (Japanese) and the second in the L2 (English).

### 6.3 PROCEDURE

In Chapter 5, I mentioned that prior to the main study, I conducted a small pilot study. Besides providing insight into how to better develop the instruments for the main study, this pilot study also brought forth some crucial methodological problems. In order to

minimize these problems for the main study, I had to adjust a number of procedures.

Below are three pivotal complications that surfaced during the pilot study and while analyzing the participants' responses:

- The creativity and metaphor sections of this study relied on paper and pencil writing exercises. After looking over the responses, I found that many of them were illegible and would require some guessing or additional assistance to interpret the handwriting.
- The environment and process was not conducive to creativity. It was rigid, over controlling, and not very relaxing.
- After conversing with the informants who participated in the study and others who wanted to participate but could not fit it into their schedules, I concluded that the length was too long for one sitting and in order to gather enough informants I had to be more flexible in the format of conducting it.

Taking the above factors into account, I reformatted the data collection procedure accordingly for the main study. First, I transferred the material into Google forms, so the participants could type the responses instead of handwriting them. I made these forms available online and accessible through the computers within the university's language learning center. In addition, the new format divided the test into four clear sections that could then be taken at separate time slots, allowing for more flexibility (see Figure 6.1). Yet, it should be noted that once a participant started a section, one had to complete that section in order for the data to be saved correctly.

この研究に参加したい場合は、まずこの同意書をサインしてください: [同意のフォーム](#)

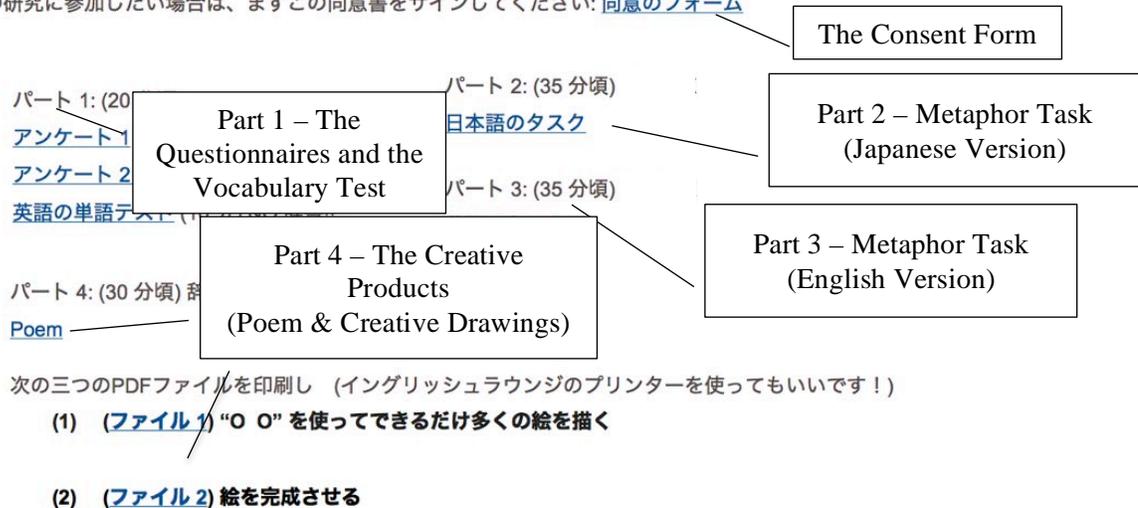


Figure 6.1: Screen shot of the front web page of the study divided into the four parts

Student participants entered the language-learning center and informed the staff that they wanted to take part in this research. The staff asked them to fill in their names and arrival times on a sign-in form. If this was their first visit, they were informed of the procedures to complete this research. In addition, they were told to spend a total of 2 hours to complete all four parts, but they did not have to complete all four parts in one sitting. When they left, they marked the departure times on the sign-in form. Figure 6.2 provides a photo of the language learning center and the computers available for the participants to use.



Figure 6.2: Photo of the language-learning center and computers used in the study

Students were explicitly told to respond as creatively as possible to the various creative production and metaphor tasks in the study. Explicitly instructing participants to “be creative” has been shown in previous research to increase creative performance on the given tasks (Chen et al., 2005; Harrington, 1975). Students did not use their names on any of these forms, except when they signed the consent form. In order for me to be able to assemble the different sections of the study together for each participant, the participants used their student ID codes. After all the sections had been assembled into one spreadsheet data form, these ID codes were converted into a simplified and completely anonymous set of participant codes. All the data collected was stored in a password protected Google account dedicated to this research. Nobody else besides the primary researcher had access to this account.

#### 6.4 PROCEDURE FOR ASSESSMENT

Since this study used a wide array of tasks to evaluate both creative traits in the individual and competencies to produce creative metaphors, assessing all these tasks

proved to be quite difficult. This is especially true when attempting to assess creativity in general. One possible way to accomplish this requires the use of outside evaluators in order to provide some ecological validity to the assessment. The goal was to obtain high inter-rater reliability in their evaluations of the participants' responses, which then would indicate a certain amount of consensual assessment and thereby reducing an overreliance on subjectivity in the data. Yet obviously, the assessment of creativity in its very nature is subjective and the difference between anomaly and creativity is at times ambiguous, but likewise in the real world, something is often deemed creative when a group of judges concur and then state that it is so (see Amabile, 1996 for a detailed outline of the reliability and validity of using the CAT to evaluate creativity and Chapter 4.5.1). In the next two subsections, I discuss in detail how the creativity instruments and metaphor tasks were assessed and the methods used in order to complete this.

#### 6.4.1 ASSESSMENT OF PERFORMANCE ON THE CREATIVITY INSTRUMENTS

The creativity tasks were arranged into two different sections. The questionnaires were part of the first section of the study, and all 130 participants completed them. In contrast, the creative products (the drawings and poem) were the fourth section of this study and the participant completion rate for this section dropped to 92% (119 of the 130 participants). The questionnaires used quantitative analysis to assess the participants' responses while the creative products relied on the consensual assessment technique to measure the creativity of that specific product. The following parts of this subsection provide a detailed look at the assessment method for each instrument. I first describe the questionnaires and then look at the creative products.

#### 6.4.1.1 The Creativity Tasks: The Questionnaires

##### 16-Item Five-factor Model of the Creative Personality Questionnaire (FFM-CPQ) Assessment

Participants replied to the 16 items in the FFM-CPQ using a 6-point Likert scale ranging from “Completely disagree” (1) to “Completely agree” (6). The initial prompt was the following:

I see myself as someone who...

This prompt was followed by the 16 items in the questionnaire such as, “Has a rich imagination”. Table 6.3 provides the means and standard deviation of the 16 items in the main study ranked by highest mean to lowest.

TABLE 6.3: ITEMS ON THE 16-ITEM FFM-CPQ BASED ON MEAN SCORES

<sup>a</sup>	<b>Item</b>	<b>Mean</b>	<b>SD</b>
9	Has wide interests	4.68	1.30
16	Feels others’ emotions	4.43	1.21
4	Is very curious about learning new things	4.32	1.19
2	Is “sunao”	4.27	1.24
12	Likes to solve difficult problems	4.22	1.34
13	Often searches for stimulating things	3.84	1.45
14	Is very energetic	3.75	1.35
7	Sees the beauty in things that others might not notice	3.68	1.43
3	Plays it by ear	3.64	1.36
15	Has a narrow world view	3.61	1.33
1	Has a rich imagination	3.52	1.27
8	Likes to get lost in thought	3.38	1.31
11	Is afraid to draw attention to oneself	3.31	1.48
10	Do things in a half-way manner / Does a sloppy job of work	3.22	1.35
5	Not really interested in art and other works of beauty	3.13	1.59
6	Is manipulative	2.66	1.43

n=130

<sup>a</sup> order in the questionnaire

The 16-item FFM-CPQ has an acceptable Cronbach’s alpha ( $\alpha=0.78$ ), which indicates that there is adequate internal consistency and the plausibility that these items measure a single latent construct. It should be noted here that internal consistency, which is the interrelatedness of a set of items, is important for but not synonymous with homogeneity or the unidimensionality of a set of items (Schmitt, 1996). Table 6.4 provides the inter-item correlations. Looking at those with high correlations such as (4) “Is very curious about learning new things” and (9) “Has wide interests” (0.60); (1) “Has a rich imagination” and (8) “Likes to get lost in thought” (0.59); (13) “Often searches for stimulating things” and (14) “Is very energetic” (0.54) and (5) “Not really interested in art and other works of beauty\*” and (7) “Sees the beauty in things that others might not notice” (-0.37), these suggest that there is good internal reliability between the items.

TABLE 6.4: INTER-ITEM CORRELATION MATRIX

Items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	<b>1.0</b>															
2	.28	<b>1.0</b>														
3	.35	.27	<b>1.0</b>													
4	.44	.26	.51	<b>1.0</b>												
5	-.30	-.01	-.08	-.15	<b>1.0</b>											
6	.23	-.01	.21	.24	-.09	<b>1.0</b>										
7	.40	.06	.18	.42	-.37	.08	<b>1.0</b>									
8	.59	.18	.34	.50	-.24	.17	.39	<b>1.0</b>								
9	.20	.16	.43	.60	-.29	.20	.38	.43	<b>1.0</b>							
10	-.01	-.17	-.14	-.10	.07	.03	.00	.11	.02	<b>1.0</b>						
11	-.17	-.04	-.25	-.24	.04	-.19	-.18	-.25	-.18	.04	<b>1.0</b>					
12	.24	.15	.35	.42	-.10	.11	.39	.46	.41	-.10	-.12	<b>1.0</b>				
13	.30	.01	.50	.48	-.21	.16	.30	.44	.52	.15	-.40	.44	<b>1.0</b>			
14	.30	.26	.51	.48	.02	.19	.22	.39	.40	.00	-.28	.40	.54	<b>1.0</b>		
15	-.24	-.14	-.49	-.25	.09	.02	-.09	-.23	-.07	.14	.27	-.26	-.27	-.17	<b>1.0</b>	
16	.10	.12	.20	.14	-.13	-.14	.07	.08	.17	.04	-.00	.10	.22	.27	-.12	<b>1.0</b>

## 24-Item Creative Personality Questionnaire (CPQ) Assessment

The 24-item CPQ used a similar questionnaire method, as the above 16-item FFM-CPQ.

Table 6.5 provides the means and standard deviation of the 24 items in the main study ranked by highest mean to lowest.

TABLE 6.5: ITEMS ON THE 24-ITEM CPQ BASED ON MEAN SCORES

<sup>a</sup>	Items	M	SD
14	A good teacher is one who gets students to become more curious about the world. (EM)	5.22	0.93
6	Acquiring new knowledge about the world is very stimulating to me (EM)	5.00	1.03
24	I prefer a teacher who is serious than one who is playful (TA*)	4.85	0.98
11	I am not very curious (TA*)	4.72	1.13
10	I like things that are new and unusual (EM)	4.56	1.28
2	I often daydream (EM)	4.50	1.31
19	I like to discover new things on my own outside of class. (EM)	4.48	1.12
4	I am studying at university simply because I enjoy learning new things (PM)	4.35	1.45
12	I usually accomplish what I set out to do (PM)	4.15	1.13
7	I like to strictly follow a daily routine in my life (TA*)	4.12	1.40
17	I am reluctant to participate in new endeavors (TA*)	3.98	1.38
16	I have a “never give up” attitude in life (PM)	3.92	1.66
8	I often am absorbed in my studies and lose track of time (PM)	3.86	1.39
9	I believe I am good at adapting to new and unfamiliar situations (SE)	3.83	1.43
1	I’m good at finding common characteristics among dissimilar things (SE)	3.61	1.18
18	I often think of new ways to use things around me (SE)	3.26	1.34
5	I am good at proposing original solutions to a problem (SE)	3.24	1.35
13	I am knowledgeable about many different subjects (SE)	3.10	1.33
3	I prefer to conform to the rules than stand out (TA*)	3.05	1.39
21	I am good at making analogies (SE)	2.99	1.24
23	I quit when I cannot solve a problem (PM*)	2.96	1.31
22	In a discussion, I rarely have an opinion on the topic (SE*)	2.92	1.46
15	When confronted by a risk I will choose the safer side of things (TA*)	2.60	1.32

<sup>a</sup> order in the questionnaire

SE – Self-efficacy; PM – Persistent intrinsic motivation; TA – Tolerance towards ambiguity; EM – Exploratory intrinsic motivation

\* - Reverse items

As mentioned in Chapter 5, from a pilot study that developed this questionnaire, four components theoretically labeled as the following emerged from that study: (1) Self-efficacy (SE); (2) Persistent goal directed motivation (PE); (3) Tolerance of Ambiguity

(reversed items for Reluctance / Intolerance to ambiguity) (TA); and (4) Exploratory motivation (EM). Tables 6.6 – 6.9 provide the inter-item correlations, Cronbach’s alpha, and the average mean of all the items. Results indicate that self-efficacy and tolerance towards ambiguity items showed adequate reliability while the other two components showed questionable reliability. Despite this low reliability, which could be related to the shorter length of the measures, they may still be quite useful (see Schmitt, 1996).

TABLE 6.6: SELF-EFFICACY (SE) (AVERAGE MEAN WITH ITEM 22 REVERSED M=3.45)

<sup>a</sup>	1	5	9	13	18	21	22*
1	<b>1.0</b>						
5	.32	<b>1.0</b>					
9	.35	.34	<b>1.0</b>				
13	.35	.38	.28	<b>1.0</b>			
18	.32	.47	.12	.44	<b>1.0</b>		
21	.37	.26	.19	.36	.16	<b>1.0</b>	
22*	.14	.37	.42	.14	.06	.15	<b>1.0</b>

<sup>a</sup> order in the questionnaire

$\alpha=0.73$

\* - Items reversed

TABLE 6.7: PERSISTENCE AND MOTIVATION (PM) (AVERAGE MEAN 4.00 \* WITH ITEM 23 REVERSED)

<sup>a</sup>	4	8	12	16	23*
4	<b>1.0</b>				
8	.35	<b>1.0</b>			
12	.15	.41	<b>1.0</b>		
16	.15	.27	.45	<b>1.0</b>	
23*	.25	.33	.37	.24	<b>1.0</b>

<sup>a</sup> order in the questionnaire

$\alpha=0.67$

\* - Items reversed

TABLE 6.8: TOLERANCE OF AMBIGUITY (TA) (AVERAGE MEAN 3.89)

<sup>a</sup>	3	7	11	15	17	24
3	<b>1.0</b>					
7	.48	<b>1.0</b>				
11	.38	.37	<b>1.0</b>			
15	.37	.27	.32	<b>1.0</b>		
17	.33	.25	.46	.34	<b>1.0</b>	
24	.14	.40	.31	.05	.25	<b>1.0</b>

<sup>a</sup> order in the questionnaire

$\alpha=0.73$

TABLE 6.9: EXPLORATORY MOTIVATION (EM) (AVERAGE MEAN 4.75)

<sup>a</sup>	2	6	10	14	19
2	<b>1.0</b>				
6	.20	<b>1.0</b>			
10	.18	.42	<b>1.0</b>		
14	.24	.41	.31	<b>1.0</b>	
19	.17	.29	.36	.17	<b>1.0</b>

<sup>a</sup> order in the questionnaire

$\alpha=0.64$

Table 6.10 provides the inter-item correlations between the four constructs in this creative personality questionnaire. As expected all four items showed positive and significant correlations.

TABLE 6.10: INTER-ITEM CORRELATIONS BETWEEN THE FOUR COMPONENTS ON THE 24-ITEM CPQ

	Self Efficacy	Persistent Motivation	Tolerance of Ambiguity	Exploratory Motivation
Self Efficacy	<b>1.0</b> .00			
Persistent Motivation	.41** .00	<b>1.0</b> .00		
Tolerance of Ambiguity	.57** .00	.33** .00	<b>1.0</b> .00	
Exploratory Motivation	.53** .00	.36* .00	.53** .00	<b>1.0</b> .00

N=130

\*\* Correlation is significant at the 0.01 level

\* Correlation is significant at the 0.05 level

### Past Creative Achievements Assessment

The participants for this section of the study were asked to choose a binary “yes/no” response to the following prompt:

Outside of your school classes have you ever ~ ? Yes \_\_\_\_ | No \_\_\_\_

This prompt was followed by a list of 34-items categorized into different domains of experience such as “Music, Arts and Writing” and “Math, Science and Computers” (See Table 6.11 for the full list). Each item was weighed (from 1 to 3) based on the significance of the achievement. For instance, the first item “taken an art class” is weighed with a “1” score and the total cumulative score in the main study for this item is “74”, which means that 74 of the 130 participants marked “yes” here. On the other hand, the item “sold an item of your art” is weighed with a “3” and has a total cumulative score of “12”, which means that only 4 participants marked “yes” for this item. Table 6.19 provides the complete list of the items along with the total cumulative score for each item.

TABLE 6.11: PAST CREATIVE ACHIEVEMENT ITEMS BASED ON CUMULATIVE SCORES

<sup>a</sup>	MUSIC, ARTS and WRITING (14 <sup>b</sup> )	<sup>c</sup>
1	taken an art class	74
2	won a prize for your art	104
2	displayed your art in an exhibition	70
3	sold an item of your art	12
1	studied one of the traditional Japanese arts (flower arrangement, calligraphy, tea ceremony)	71
2	displayed your traditional Japanese arts (flower arrangement, calligraphy, tea ceremony) in an exhibition	74
1	done creative writing (poetry, short story, novel, manga)	39
2	won a prize for your writing	24
2	participated in a public reading of your writing	20
3	published your writing in a journal or book	9
1	taken a music class	65
2	won a prize for your music	40
2	publicly played a music concert	64
3	recorded your own music	96
<b>MATH, SCIENCE AND COMPUTERS (7)</b>		
2	designed your own web site	34
2	put together your own computer, radio, or other electronic device	38
2	designed your own software	22
2	won a prize at a science fair or local science event	16
2	won a math award	4
2	invented something that has actually been made and used by other people	6
3	published in any kind of scientific research	18

CLUBS, THEATER, DANCE, PERFROMANCE and PRESENTATIONS (6)		
1	started your own club	4
2	acted live on stage for a theater play	16
2	directed or produced a play or a short movie (YouTube)	20
2	performed publicly in a dance performance	60
2	done live comedy	30
2	won a prize at a speech or presentation contest	30
HOME ARTS (7)		
1	invented a game	8
1	cooked your own original recipe	39
1	planned a trip by yourself	65
1	designed your own clothing	8
1	made someone a present	78
1	made your own jewelry	23
1	collected things (coins, stamps, insects, tape)	46
OTHER (WRITE IN ITEMS)		
1	(e.g.) Nail art, wrote lyrics to a song, pottery, made furniture, made a plastic model	26

N=130

<sup>a</sup>This number represents how each item is weighed - the higher the number the more significant the creative achievement.

<sup>b</sup>This number is the total number of items in this domain

<sup>c</sup>This number is the total cumulative score of all the participants for this individual item.

In the main study, the minimum score among all the participants was 0 and the highest score was 34 with an average mean cumulative score of 10.33. The total possible cumulative score score for this questionnaire was 78.

### Creative Self-Beliefs Assessment

In this questionnaire, participants were asked to score on a 10-point scale from (1) “not creative at all” to (10) “very creative”, the level of creativity they believe they have in various domains of experience. This questionnaire has 24-items, so a total of 240 points is the highest possible score. In the main study, the minimum score was 56 and the maximum was 230 (M= 147, SD=40). Table 6.12 provides the means and standard deviation of the 24 items in the main study ranked by highest mean to lowest.

TABLE 6.12: ITEMS ON THE 24-ITEM CREATIVE SELF-BELIEFS QUESTIONNAIRE BASED ON MEAN SCORES

<sup>a</sup> Items	Mean	SD
4 Writing a computer program.	7.05	2.54
6 Acting in film or theater.	6.60	2.78
3 Doing puzzles or figuring out riddles.	6.58	2.57
10 Thinking of new ways to use things around you.	6.57	2.37
24 Doing art (drawing, painting, photography, pottery, graphic design).	6.56	3.11
21 Finding something fun to do even when you don't have any money.	6.50	2.92
13 Solving difficult math problems.	6.45	2.70
14 Coming up with humorous jokes.	6.39	2.68
5 Giving a speech or presentation.	6.28	2.64
9 Home life (clothes fashion, gardening, cleaning, cooking).	6.22	2.61
7 Settling disputes between friends.	6.20	2.61
18 Maintaining a good balance between my studies and my personal life.	6.15	2.64
23 Brainstorming new ideas with your friends.	6.15	2.69
12 Doing sports, gymnastics or dance.	6.07	2.48
22 Doing experiments.	6.04	2.48
11 Thinking of ways to help the community.	6.02	2.14
1 Writing poems or short stories.	5.84	3.33
15 Coming up with ways to fix a buggy computer.	5.82	2.84
19 Putting together electronic devices (radio, computer, robot)	5.82	3.22
16 Playing a musical instrument or singing.	5.81	2.82
20 Traveling and interacting with other cultures.	5.68	2.63
8 Sketching out ideas that you come up with for inventing a new product.	5.56	3.35
17 Making people feel relaxed and comfortable.	5.22	3.21
2 Teaching something to someone.	5.19	3.35

N=130; <sup>a</sup> order in the questionnaire

Tables 6.13 – 6.15 provide the inter-item correlations and Cronbach's alpha for each of the three creativity domains found in this questionnaire. All three show adequate to good internal reliability.

TABLE 6.13: THE ARTS AND PERFORMANCE ITEMS

<sup>a</sup>	1	5	6	9	12	14	16	24
1	<b>1.0</b>							
5	.36	<b>1.0</b>						
6	.36	.53	<b>1.0</b>					
9	.24	.27	.43	<b>1.0</b>				
12	.03	.31	.42	.38	<b>1.0</b>			
14	.48	.39	.62	.42	.42	<b>1.0</b>		
16	.10	.28	.36	.32	.29	.40	<b>1.0</b>	
24	.65	.39	.55	.38	.17	.56	.18	<b>1.0</b>

$\alpha=0.82$ ; <sup>a</sup> The numbers are how they appeared in the questionnaire and correspond to the items in the before mentioned table

TABLE 6.14: THE SOCIAL SELF ITEMS

<sup>a</sup>	2	7	11	17	18	20	21	23
2	<b>1.0</b>							
7	.48	<b>1.0</b>						
11	-.17	.12	<b>1.0</b>					
17	.72	.37	.04	<b>1.0</b>				
18	.35	.49	.13	.45	<b>1.0</b>			
20	.08	-.02	.26	.26	.11	<b>1.0</b>		
21	.60	.31	-.09	.71	.31	.05	<b>1.0</b>	
23	.24	.08	.30	.47	.09	.34	.31	<b>1.0</b>

 $\alpha=0.76$ 

TABLE 6.15: THE SCIENCES, MATH AND LOGIC ITEMS

<sup>a</sup>	3	4	8	10	13	15	21	23
3	<b>1.0</b>							
4	.23	<b>1.0</b>						
8	.29	.34	<b>1.0</b>					
10	.29	.28	.45	<b>1.0</b>				
13	.45	.48	.49	.32	<b>1.0</b>			
15	.30	.42	.20	.29	.29	<b>1.0</b>		
19	.29	.15	.64	.17	.56	.04	<b>1.0</b>	
22	.05	.28	.50	.39	.30	.27	.31	<b>1.0</b>

 $\alpha=0.79$ 

In summary, in the above analysis, I have described the descriptive statistics from the 4 questionnaires used in the main study. The first two looked specifically at the creative personality. I used these two in order to look at creativity from multiple trait dimensions. The Past Creative Achievement Questionnaire examined the participants past experiences in a range of creative activities. This type of questionnaire has been widely used in the literature to measure “real world” creativity (see Chapter 4), but was developed specifically for this study for Japanese university students. The final questionnaire looked at one’s perceived creativity in varying domains. In this next part of this subsection, I shift my focus from the questionnaires to the creative products.

#### 6.4.1.2 Creativity Tasks: The Creative Products

In the main study, I used three different tasks to prompt the participants to produce a creative product. Two prompted them to generate some form of a drawing and the third one prompted them to write a short poem. I explain how each one of these tasks was assessed below and provide some examples of the variations in scores.

##### Creative Product: Drawing Assessment

As explained in more detail in sections 4.1.1 and 5.3.3, participants completed two different drawing tasks. In the first task, the participants were presented with an incomplete picture consisting of only 4 lines, which they then were asked to complete. In the second drawing task, the participants were given a page full of circles and were asked to draw as many pictures as possible from these circles. In order to assess the creative product drawings 1 and 2, I recruited three (3<sup>rd</sup> and 4<sup>th</sup> year) undergraduate art majors from the faculty of education to evaluate the drawings. I placed all the images onto a PowerPoint file, one drawing per slide<sup>13</sup>. The evaluators came into a small classroom with a large Big Pad in the room. They were told to use their own subjective opinion of creativity and to evaluate each one accordingly. They viewed each slide for approximately 5-8 seconds. In order to first get a feel of the level of creativity among these drawings, they viewed all of them twice. The first time, they were asked to simply mark an “L”, “M”, or “H” next to each number corresponding to each drawing. Then the second time viewing the drawings, each rater evaluated the drawings on a 6-point Likert scale from (1) “not creative” to (6) “very creative”. The three evaluators inter-rater

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<sup>13</sup> See <http://bbirdsell.wixsite.com/index/project-page> and <http://bbirdsell.wixsite.com/index/creativity-research-2> for a full list of these drawings in PDF format

reliability was very good (Drawing 1,  $\alpha=0.88$ ; Drawing 2,  $\alpha=0.94$ ). For Drawing 1, the average cumulative score by the three raters was 9.45 with a range from 3 to 18 and 9.24 with a range from 3 to 18 for Drawing 2. The two sets of scores for the drawings were then summed for a total creative product drawing score with a range from 6 to 35 and an average score of 18.69. Figures 6.3 and 6.4 show examples of the range of scores from low to high as judged by the evaluators.

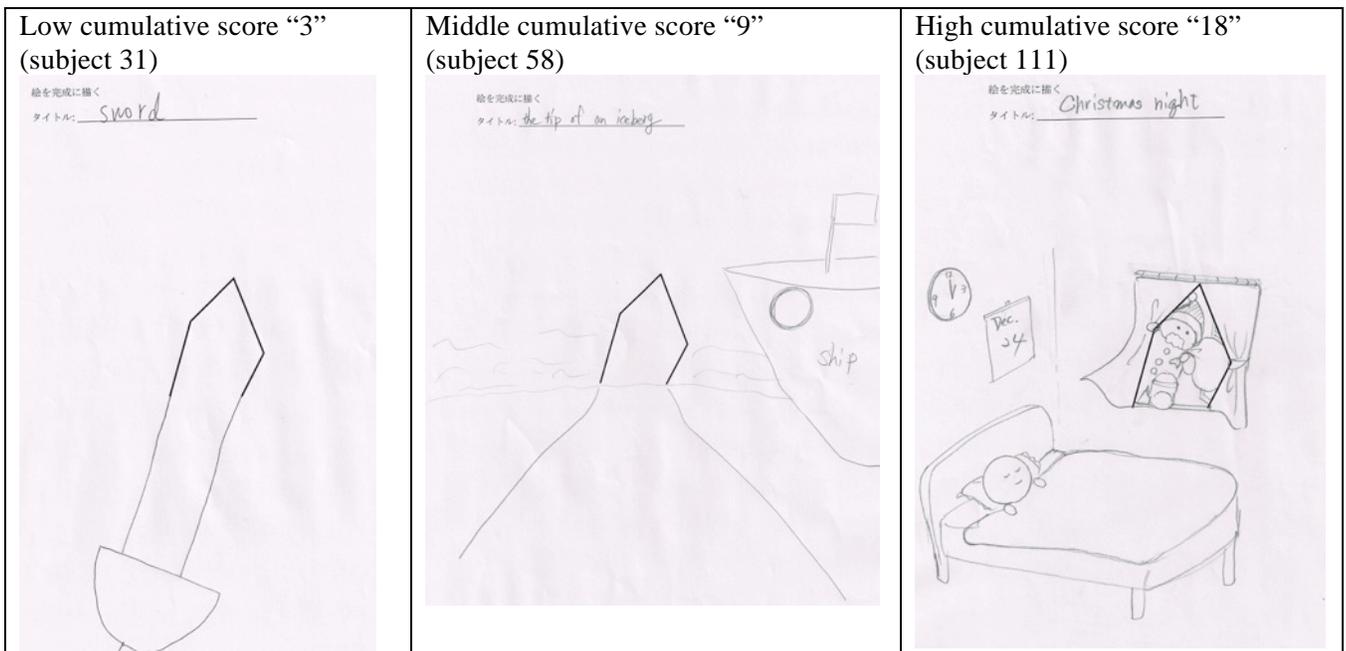
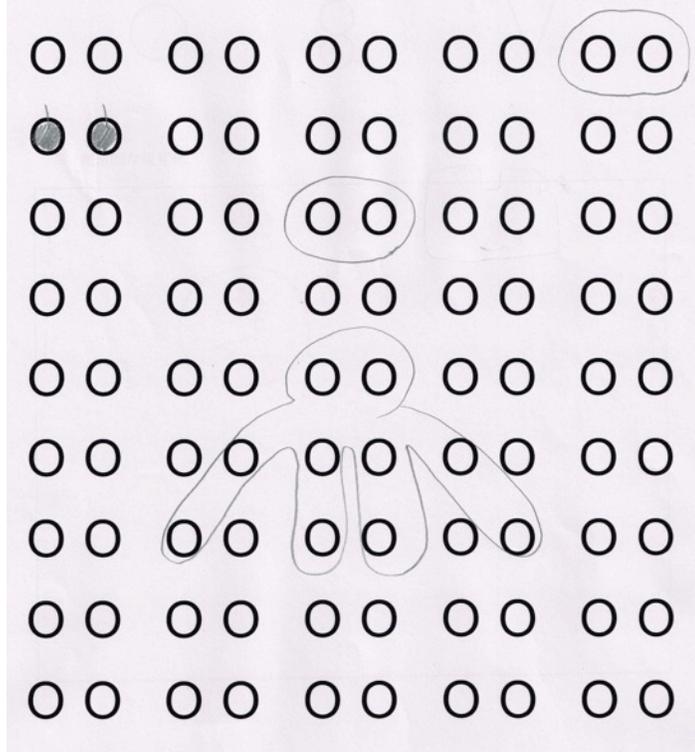
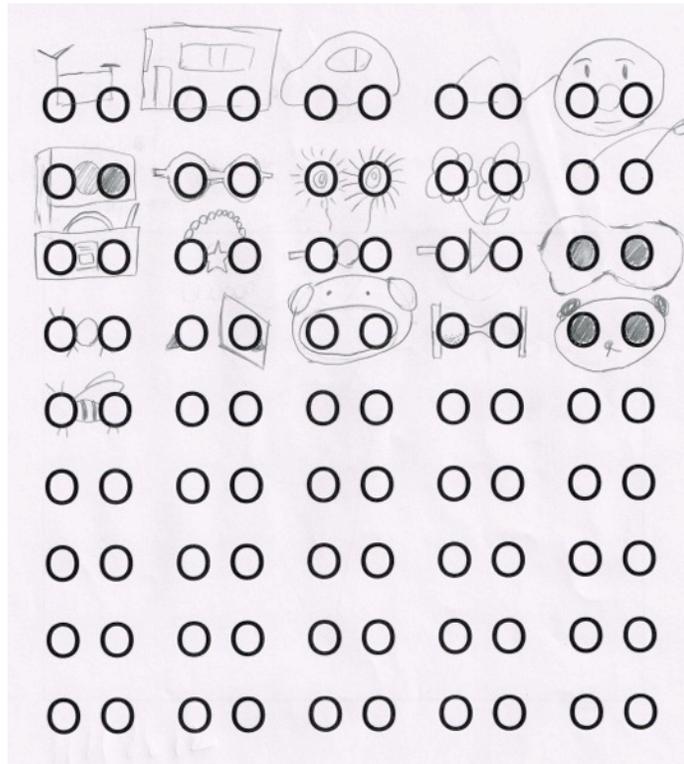


Figure 6.3: Examples of the range of scores for the drawing task 1

Low cumulative score "3"  
(subject 38)



Middle cumulative score "9"  
(subject 22)



High cumulative score “18”  
(subject 61)

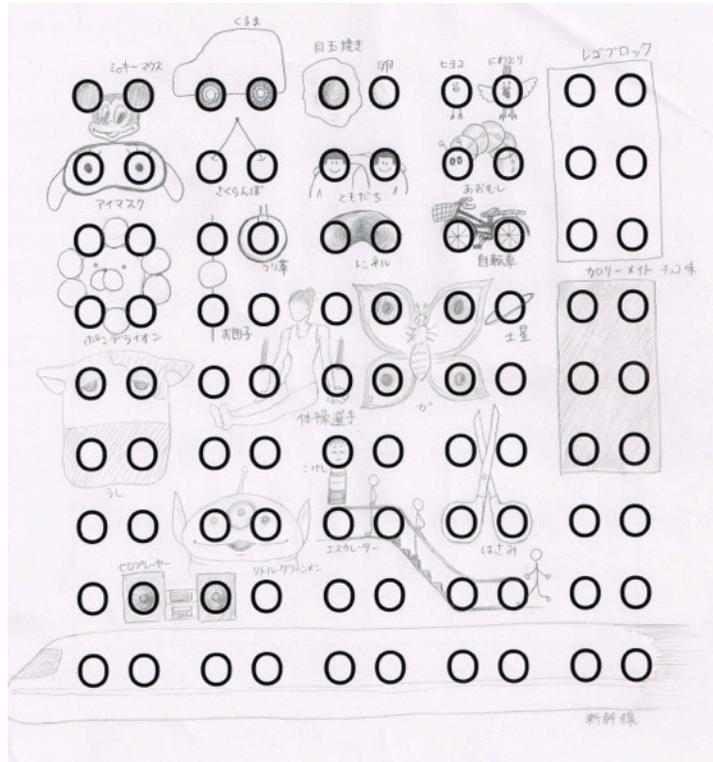


Figure 6.4: Examples of the range of scores for the drawing task 2

### Creative Product Drawing 1: Originality

The originality, or the statistical uniqueness, of drawing 1 was also assessed using the pilot study results as a criterion. In Chapter 5, I outlined how I developed this originality criterion based on a collected pool sample of drawings over a two-year span. They were scored based on a 6-point scale. 6-point scores were given to drawings that were completely original, 5-point scores to those that had occurred 3 times or less (e.g., fish, tower, boat) and each subsequent lower score were more statistically common drawings up until 1-point, which referred to those that occurred over 10% (e.g., pen/pencil and house) in the collected pool sample. The scores in the main study ranged from 1 to 6 with a mean average of 3.54.

### Creative Product Drawing 2: Fluency

Creative product drawing 2, which required the participants to draw as many pictures as possible from a series of circles, were then given a fluency score based on the sheer number of drawings each participant drew (along with the before mentioned overall creativity score). On the page there were 5 pairs of circles horizontally arranged into 9 rows. So there were 45 possible images, although it should be noted that many participants did not restrict themselves to drawing an image for each pair of circles, which means that one image could include a number of circles (e.g., the legs of an octopus could include 5-6 pairs of circles). I created a simple scoring criterion for this in order to maintain a 6-point scale, similar to the originality criterion, based on counting the number of images (see Table 6.16 for the complete 6-point scale). For instance, subject 38 only drew 4 images, so received 1-point. On the other hand, subject 22 produced 21 images, so received 3-points (see Figure 6.4 above for the drawings from these subjects).

TABLE 6.16: SCORING CRITERION FOR DRAWING 2 FLUENCY ASSESSMENT

1	0 – 7
2	8 – 15
3	16 – 23
4	24 – 31
5	32 – 39
6	Over 40

### Creative Product: Poem Assessment

For the final creative product, the participants were asked to write a short poem like a haiku. In section 4.5, I described the rationale for using this type of creative product. Moreover in section 5.3.2, I provided some background in how I developed this task

specificity for this final study. In order to score the creativity of these short poems, five independent raters were selected to assist in evaluating the poems in this study. Four of the five raters were professors at a national university in Japan and the fifth one was a PhD student in an Asian Studies department at a university in the U.S., but was currently doing research in Japan. Three were native Japanese speakers with some knowledge of English and two were native English speakers, but highly fluent in Japanese and had a strong background in Japanese literature (i.e., the before mentioned PhD student). Each rater was first provided a hard copy of all the poems and asked to read through them and provided each poem a simple score of L (“low”), M (“medium”), or H (“high”). A week later, I sent them a link to a Google form with all the poems and a 6-point scale under each poem (see Figure 6.5 for an example). They were asked now to provide a score for each poem by rating each one from 1 to 6 (“1” being the least creative and “6” being the most creative).

(01) 犬がもみじの葉をかき分け遊ぶ \*

	1	2	3	4	5	6	
NOT VERY CREATIVE	<input type="radio"/>	VERY CREATIVE					

Figure 6.5: Screenshot example of the form for rating the poems

They were also informed that there should be roughly an even number of poems distributed among the 6-point scale, but it did not have to be exactly evenly divided. The following suggestions were provided at the top of this form to help guide the raters when rating each poem:

- Is the poem creative?
- Is the word choice in the poem novel?
- Does the poem have good rhythm?
- Does the poem possess rich imagery?
- Is the poem expressed clearly?

The poems on the Google form appeared in random order for each rater therefore lessening the chance of the order influencing their scores. Each poem had a numeric code next to it (in Figure 6.5, the code is “01”), so they could reference the hard copy of poems that they had previously rated “L”, “M”, and “H”, which also had the code attached to each one. Table 6.17 provides the mean scores for each rater. Despite rater 3 and 5 scoring the poems considerably higher than rater 1, the five raters had adequate internal consistency ( $\alpha=0.70$ ) between their scores.

TABLE 6.17: MEAN SCORE FOR EACH RATER ON THE POEM ASSESSMENT

<b>Rater</b>	<b>Mean</b>	<b>SD</b>
Rater 1	2.86	1.23
Rater 2	3.23	1.25
Rater 3	3.82	0.82
Rater 4	3.30	0.94
Rater 5	3.85	1.20

n=125

The five scores for each rater than were summed, providing each participant an overall score for the verbal part of the creative product. The average score was 17.06 with a low score of “9” and a high of “26”. Table 6.18 provides a couple examples of poems that were evaluated with a “9” (low), “15” (medium), and “25-26” (high). I included “25” since only one poem received a “26” score. So in short, this means that there was not one poem that received all “1’s” or all “6’s” from all 5 raters. As mentioned in the previous chapter, participants were asked to write a short poem like a haiku, using one of the

seasons as the topic (See Appendix J for the full list of poems in Japanese by the participants).

TABLE 6.18: EXAMPLES OF SCORING VARIATION IN THE CREATIVE PRODUCT: POEMS

Low Score “9” Example	Medium Score “15” Example	High Scores “25-26” Example
<p>(subject 93) Summer has come the cherry blossoms scatter - Hirosaki Castle</p> <p>夏が来て 桜が散るなり 弘前城</p>	<p>(subject 10) With the bicycle, a whiteness swaying - one-piece</p> <p>自転車と 白く揺れる ワ ンピース</p> <p>(Note: one-piece is a Japanese borrowed word from English, but in more colloquial English refers to a dress or summer dress.)</p>	<p>(subject 84) A fleeting moment flowing unbroken a stream and a field not knowing where it goes it has a purpose</p> <p>はかなくも 縷々とし流 る 野の小川 行方も 知らず 目指すものあり (折句：はるのゆめ)</p> <p>(Note: In Japanese the subject wrote an acrostic poem – the first sound of each line makes a new word. Translated from Japanese, it is “Spring Dream”.)</p>
<p>(subject 125) I am going with you to the firework festival how I look forward to it</p> <p>君とゆく 花火大会 楽しみに に</p>	<p>(subject 62) Friends parting and meeting on this spring morning</p> <p>仲間との 別れと出会いの 春の朝</p> <p>(Note: Spring is the start of the school year in Japan.)</p>	<p>(subject 100) So many icicles All lined up – A glockenspiel!</p> <p>つららをね たくさん並べ グロッケン</p> <p>(Note: ね – is a colloquial sound meaning something like “hey look...”)</p>

A few noticeable differences emerged from these examples. First the lower scored examples tended to be very conventional (e.g., the scattering of cherry blossoms) or situational (e.g., going to a firework festival) while the mid-level scored examples used more imagery, as in subject 10’s poem. In this example, the writer mixed the movement of the bicycle with the swaying color of a dress blowing in the wind. The highest scored

poems were quite different. Subject 84 used a complex writing technique to compose the poem whereby the first sound in each line formed a word pair or perhaps a title for the poem while subject 100 created this simple, but unique analogy between a row of hanging icicles and a glockenspiel. So the combination of simplicity, uniqueness, and imagery could possibly explain why the raters highly evaluated this poem for creativity.

#### 6.4.1.3 Summary to the Creativity Assessment Section

In this subsection, I described how each creativity instrument was scored for the main study. The two personality questionnaires followed very similar scoring methods that are typically used in the psychometric tradition of personality assessment. On the other hand, the Past Creative Achievement Questionnaire used a scaling technique based on the significance of the achievement whereby some achievements had a higher score than others. The self-beliefs questionnaire relied on a cumulative score over a wide array of activities in various domains of experience. The creative products used the consensual assessment technique to score the creativity of the drawings along with a uniqueness and fluency score for drawing 1 and drawing 2, respectively. Likewise, the poem also used the consensual assessment technique to evaluate the creativity of the writing. The main difficulty in the assessment of these creative products was finding raters who had some interest, background, and specialty in the arts and poetry.

#### 6.4.2 ASSESSMENT OF PERFORMANCE ON THE CREATIVE METAPHOR PRODUCTION TASKS

A total of 124 participants completed the Metaphor Creativity Tasks in English while 128 completed the Japanese version. This discrepancy is likely based on the difficulty of

doing this task in a foreign language. Moreover it could also be the result that the English version was the 3<sup>rd</sup> part of this study and therefore it is possible that a few participants lost interest in this research and/or failed to return to complete it. In the following parts of this section, I first address the *context independent task* and then the go into more detail about the assessments in each language (English and Japanese).

#### 6.4.2.1 The Context Independent Task

Scores for the *context independent task* consisted of a fluency and creativity score. The fluency score was the cumulative number of responses they provided for each prompt while the creativity score was the summed score provided by three independent raters based on a 3-point scale. As a quick summary of this task, the participants were asked to produce as many metaphors as possible using the following four topics, two in each language: “Love” (English 1 – E1), “Memories” (English 2 – E2) and “Life” (Japanese 1 – J1) “Looking for a Job” (Japanese 2 – J2). The participants were then asked to choose the one that they thought was the most creative and provide an interpretation of it. So the fluency score was based on the absolute number of metaphors they came up with for each topic. These were then aggregated into one fluency score labeled “Japanese Context Independent Metaphor Score - Fluency” (JCIMS-F) for the L1 (Mean=8.96; Low=3; High=22) and “English Context Independent Metaphor Score - Fluency” (ECIMS-F) for the L2 (Mean=6.64; Low=2; High=19).

The second score focused on creativity and utilized a consensual assessment technique, whereby three independent raters evaluated the metaphors and interpretations of them for creativity. In order to accomplish this, I created four Google forms for each of

the four topics and inputted all the participant responses into these forms. Each metaphor/interpretation item had a unique participant code attached to it and beneath it a 3-point Likert scale scored as follows:

- **1 – *Not creative*** > literal, not appropriate, or highly conventional responses
- **2 – *Somewhat creative*** > extended conventional responses
- **3 – *Creative*** > surprising and novel responses

The raters were all professors at universities in Japan or PhD students associated with a university in the UK with some background knowledge in metaphor research. They were told to use their own opinions of creativity, but were also presented with an outline of key aspects of creativity (as presented in the previous Chapter 5.4.3), in order to rate these metaphor/interpretation items. Each rater saw the responses in a different order (randomly generated) in order to avoid any bias based on the positioning of the metaphor in the list. Scores on the 2 tasks were then aggregated into one score in each language and labeled “Japanese Context Independent Metaphor Score - Creativity” (JCIMS-C) for the L1 (Mean=9.59; Low=6; High=18) and “English Context Independent Metaphor Score - Creativity” (ECIMS-C) for the L2 (Mean=11.78; Low=3<sup>14</sup>; High=18).

#### The Context Independent Task: English

Participants in this final study completed two variants of the *context independent tasks* one in English and the other in Japanese. In order to assess the English part, three native English-speaking raters independently scored the responses for creativity. Their assessments showed adequate inter-rater reliability between them ( $\alpha=0.76$  and  $\alpha=0.74$

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<sup>14</sup> The 3 score is possible because one participant only completed one of the topics and left the other blank.

respectively for the two different tasks). Tables 6.19 (E1) and 6.20 (E2) show the raters mean scores and standard deviations for the English topics followed by a set of examples that the raters evaluated with a low score and another set they evaluated with a high score (See Appendix L for the full list of the participant responses to these two metaphor tasks in each language).

TABLE 6.19: E1: CONTEXT INDEPENDENT TASK – TOPIC: MEMORIES

<b>Rater</b>	<b>Mean</b>	<b>SD</b>
Rater 1	2.05	0.73
Rater 2	1.90	0.75
Rater 3	1.94	0.79

n=124  $\alpha=0.76$

<b>Rater 1</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 2</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 3</b>	<b>Frequency</b>	<b>%</b>
1	28	22.6	1	39	31.5	1	40	32.3
2	62	50.0	2	58	46.8	2	51	41.1
3	34	27.4	3	27	21.8	3	33	26.6

*The following are examples of those that were scored low by all 3 evaluators (English version):*

\* The first part is the metaphor, the sentence following the “>>” is the participant’s interpretation of the metaphor.

Memories are dream >> Memories fade soon. (Subject 7)

Memories are mind >> Because the one which matches mind is easier to take out and than a picture is taken with a camera a memory is in the neighborhood all the while.

(Subject 14)

Memories are life. >> Memories are grand sum of life. (Subject 89)

Memories are ambiguous >> Even if we think we remembered things correctly, our memories are not correct. We often remember mistakenly. (Subject 91)

The following are examples of those that were scored high by all 3 evaluators (English version):

Memories are bottles pouring water. >> Memories we can have is a limit. The older the memory is, the more likely it is forgot like bottle pouring water overflow. (Subject 21)

Memories are many kinds of fruits. >> There are many kinds of fruits on the earth. Tastes of fruits are various for example, bitter, sweet and sourness. We experience a lot of things in our life. So our experiences are like fruits taste. (Subject 34)

Memories are handcuffs. >> Memories are handcuffs, because memories often constrain people. (Subject 63)

Memories are leaves. >> Some memories fall down and others are eaten by worms. (Subject 108)

TABLE 6.20: E2: CONTEXT INDEPENDENT TASK – TOPIC: LOVE

<b>Rater</b>	<b>Mean</b>	<b>SD</b>
Rater 1	1.90	0.78
Rater 2	1.82	0.63
Rater 3	2.15	0.73

n=124  $\alpha=0.74$

<b>Rater 1</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 2</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 3</b>	<b>Frequency</b>	<b>%</b>
1	44	35.5	1	36	29.0	1	21	16.9
2	48	38.7	2	74	59.7	2	64	51.6
3	32	25.8	3	14	11.3	3	39	31.5

The following are examples of those that were scored low by all 3 evaluators (English version):

Love is big. >> Everyone has big love. (Subject 56)

Love is peace. >> When people love other person, they become kind to other person. It is happiness. (Subject 81)

Love is something which we can not stop. >> We cannot stop loving after it starts. (Subject 114)

Love is truth. >> No one tell a lie to love, love is a truth. (Subject 130)

*The following are examples of those that were scored high by all 3 evaluators (English version):*

Love is an umbrella. >> If it is a sunny day (good day) we don't need it or just put it in our bag. However it is rainy day, umbrella stay with us together. (Subject 44)

Love is paints. >> There are many kinds of love as there are many kinds of color in paints. Expressing love is different depending on the person while painting is different depending on the person. How to love is decided by what you have done until now and how to paint is decided by what you have done until now. (Subject 62)

Love is three-legged race. >> If they do not think about each other, they cannot advance. When one do not work well, the other can support him. (Subject 72)

Love is a hot stone. >> When we fall in love, at first the love is very ambitious, but gradually it wither. A hot stone is at first very hot, but gradually it became cold. (Subject 97)

What appears from these metaphors and the subsequent evaluations of them is that when participants used an abstract source (e.g., Memories are mind, Love is truth) to complete the metaphor they were often rated low by the evaluators, but when they used a concrete or a more embodied source (e.g., Memories are leaves, Love is a hot stone), they were rated more creative. Where raters differed in their scores, this usually only occurred by a single point. For example, one rater gave a certain response a “1” score and another rater gave the same response a “2” score. Rarely did the raters provide scores that differed by more than two points. Some examples, when this did occur are the following:

- Memories are evidence. >> Memories are our identity. Our experiences make our characters. (Subject 75) (Rater 2 score=1; Rater 1 score =3)
- Love is tolerance. >> People relatively have different ideas, so if they do not have tolerance, this world would be covered with storms of quarrels. (Subject 57) (Rater 1 score=1; Rater 3 score =3)

What is interesting about the above examples and the discrepancy in scores is how the raters may have differently interpreted the responses. The first one, “memories are evidence”, it is possible that rater 2 interpreted “evidence” as the abstract meaning of the word, “proof, confirmation, etc.” while rater 1 may have viewed it quite differently, as in, the more perceptual meaning, “signs, traces, marks, etc.”. In the latter case, memories are these physical marks or traces that one leaves behind in the world, so a memory is like a fingerprint or threadlike piece of hair left behind and points somehow to the fact that this person was once there. In contrast, the former interpretation is more difficult to conceptualize. The second metaphor example above actually appears to more closely resemble a literal statement insofar as it refers to the fact that one needs to be tolerant when showing the emotion of love. So it is relatively clear why rater 1 may have scored it

low. On the other hand, the participant's interpretation of the metaphor is quite interesting and the idea that without tolerance, love and the world in general would fall into "storms of quarrel". So one possibility for the discrepancy between the scores is that rater 1 may have focused more heavily on the metaphor and rater 3 focused more on the interpretation of it.

#### The Context Independent Task: Japanese

Three native Japanese-speaking raters independently assessed the creativity of the *context independent task*. Their assessments also showed good inter-rater reliability between them ( $\alpha = 0.82$  and  $\alpha = 0.87$  respectively for the two different tasks). Tables 6.21 (J1) and 6.22 (J2) show the raters mean scores and standard deviations for the Japanese topics followed by a set of examples that the raters evaluated with a low score and another set they evaluated with a high score.

TABLE 6.21: J1: CONTEXT INDEPENDENT TASK – TOPIC: LIFE

<b>Rater</b>	<b>Mean</b>	<b>SD</b>
Rater 1	1.84	0.64
Rater 2	1.51	0.70
Rater 3	1.67	0.63

n=128  $\alpha=0.82$

<b>Rater 1</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 2</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 3</b>	<b>Frequency</b>	<b>%</b>
1	38	29.7	1	78	61.0	1	53	41.4
2	72	56.3	2	35	27.3	2	64	50.0
3	18	14.1	3	15	11.7	3	11	8.6

*The following are examples of those that were scored low by all 3 evaluators (Japanese version):*

Life is sadness. >> In life one notices the sad and harsh things more than happy things. Therefore in order to avoid these unpleasant things, people try to improve and seek a better direction. Yet in the end, I think that life is meaningful because of the sadness. [人生は悲しみだ。>>人生は幸せなことよりも悲しみや苦しみのほうが目につく。だからこそその嫌なことを避けるた

めに改善を求めていい方向に持っていかうとする。だから、結局は人生は悲しみがあつてこそそのものだと思うから。(Subject 45) ]

Life is effort. >> I think that the most important thing in life is effort. In order to achieve one's goals, effort is essential. Humans are human beings because they keep trying until they die. [ 人生は努力です。>> 人生において一番大切なものは努力だと思います。どんな目標を達成するにしろ努力が欠かせません。人間は死ぬまで努力し続けることで人間たるのです。(Subject 58) ]

*The following are examples of those that were scored high by all 3 evaluators (Japanese version):*

Life is an electrocardiogram. >> An ECG moves up and down like the repetitive up and down movement of success and failure in life. [人生は心電図 >>心電図が上下するように、人生もうまくいくこととうまくいかないことの繰り返しだから。(Subject 22)]

Life is stir-fried vegetables. >> Stir-fried vegetables basically are not decided for you, but you have to choose the ones to cook with and also the spices you use. Everyone also cuts up the vegetables differently. So if ten people made stir-fried vegetables, you are likely to get ten different kinds of stir-fried vegetables. This is the same as life. [人生は野菜炒めです。>>野菜炒めは、基本的な材料が決まっていないから、自分で材料を選んで、味付けも考えなければなりません。野菜の切り方も色々だし、十人が作ったら十種類の野菜炒めができます。これは人生に通じます。(Subject 111)

TABLE 6.22: J2: CONTEXT INDEPENDENT TASK – TOPIC: JOB-HUNTING

<b>Rater</b>	<b>Mean</b>	<b>SD</b>						
Rater 1	1.70	0.74						
Rater 2	1.34	0.61						
Rater 3	1.53	0.66						
n=128 $\alpha=0.87$								
<b>Rater 1</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 2</b>	<b>Frequency</b>	<b>%</b>	<b>Rater 3</b>	<b>Frequency</b>	<b>%</b>
1	59	46.1	1	94	73.4	1	72	56.3
2	48	38.0	2	25	19.5	2	44	34.4
3	21	16.4	3	9	7.0	3	12	9.4

The following are examples of those that were scored low by all 3 evaluators (Japanese version):

Job-hunting is a meeting. >> It is a place to meet friends who you will work with in the future and meet your future bosses. At the same time, it is also a place to earnestly meet to carry out plans to raise profits and return some of these profits to make new products and services. [就活は出会いです。>> 将来一緒に同じような業務内容の仕事をするであろう仲間に出会ったり、将来の上司に出会ったりする場所です。同時に、会社という、利益を上げてその一部を新しい商品やサービスに還元するサイクルを行なっていく場所に本格的に出会うところでもあります。(Subject 1)]

Job-hunting is is difficult. >> You have to think about what kind of person you are and what you want to do in the future. Then go to many companies and do many interviews. When rejected from these jobs, you will become very depressed. Looking at all of this, job hunting is very hard. [就活は大変です。>> 自分はどのような人か、将来どうなりたいのか、自分について考えること。多くの企業に行って、面接などをすること。不採用になるとすごく落ち込むこと。これらを全部見て、就活はとても大変です。(Subject 12)]

The following are examples of those that were scored high by all 3 evaluators (Japanese version):

Job-hunting is a tide. >> The one who can successfully ride the wave will be raised up. After a long time adrift that person will be lifted up. [就活は潮流です。>> うまく波に乗れたものが引き上げられます。長い漂流の後、引き上げられたりします。(Subject 23)]

Job-hunting is *natto*<sup>15</sup>. >> Natto is said to be delicious when you eat it after mixing it 100 times. It is because you have to work hard to get used to job hunting after preparing firmly as you did before eating natto. [就活は納豆です。>> 納豆は、100回まぜてから食べるとおいしいという。就活も納豆を食べる前のようにしっかりと準備をおこなってから、ねばりづよくがんばらねばならないから。(Subject 126)]

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<sup>15</sup> *natto* is a common type of food in Japan, which is typically translated as sticky fermented soybeans.

Differences of two points again were uncommon among the raters. It did occur in a few examples, especially with rater 2 who generally gave the responses a lower score compared to the other two raters. Below are two examples when this did occur:

- Life is a cicada. >> That is to say in a moment it just passes by.人生は蟬です。>> あっという間に過ぎてしまうということ。(Subject 53) (Rater 1 score=3; Rater 2 score =1; Rater 3 score =3)
- Life is a field. >> Life is a field because after much effort every day, it bears fruit. Thanks to the sun, rain, insects, and many other things a field can develop, in a similar way, life can be developed thanks to the help of many people. 人生は畑です。>> 日々の努力の分だけ実りがあるから。太陽や水、虫など多くのもののおかげで成り立つように、人生もまた多くの人のおかげで成っているから。(Subject 127) (Rater 1 score=3; Rater 2 score =1; Rater 3 score =2)

In the next part of this subsection, I address the second metaphor task used in the main study, the *context dependent task*. I first describe the scoring criteria and then the descriptive statistics for this task in both languages.

#### 6.4.2.2 The Context Dependent Task

The *context dependent task* required the participants to complete a sentence that primed them to use a metaphor. In order to evaluate participant responses to this task, I used a scoring criterion based on the following scale in this study:

- **1 – Not Creative** > literal or highly conventional responses
- **2 – Somewhat Creative** > extended conventional responses
- **3 – Creative** > novel, but difficult to find meaning in the responses
- **4 – Very Creative** > novel, surprising, and meaningful responses

As discussed in Chapter 5, it was decided that this scale needed one additional score compared to the context independent task, due to the greater variation in the responses. For instance, in the context independent task, the participant had to complete a metaphor, but in this task, the participant was simply primed by the context to use a metaphor to complete the sentence, but could also have provided a more literal response. The differences between these 4-scores were determined based on a number of features such as conventionality, familiarity, and literalness on the lower side of the scale and novelty, originality, and surprise on the higher side of the scale. Also appropriateness was considered an important factor for a response to be very creative. That is to say, it had to allow one to recover the familiar within the novelty of the response or more precisely it had to allow one to construe meaning within it. It should be noted here that when a participant attempted to complete a few sentences in this task (there were a total of 5 sentences), but left others blank – in such cases, these responses were given a “0” score. For participants who did not even attempt to complete this section were provided “data not available” for this section of the study. For the Japanese version, I first went through all the responses and translated them into English. Then for each version (English and Japanese), I gave the responses a score from 1-4 based on the above criteria. Then two native English speakers corroborated these scores for the English responses and two native Japanese speakers did the same for the Japanese responses. Items of disagreement between the raters were then discussed until a compromise was reached. Scores on the 5 complete the sentence items were then aggregated into one score in each language and labeled “Japanese Context Dependent Metaphor Score” (JCDMS) and “English Context Dependent Metaphor Score” (ECDMS).

The Context Dependent Task: English

In this task, the participants had to complete 5 sentences that primed them to use a metaphor. Each sentence was coded. For instance, the first English sentence was coded E1 and the next one E2 and subsequent ones followed this pattern. Table 6.23 provides the English items' mean scores and standard deviations for each of the 5 sentences and the total average cumulative score for all 5 items. Table 6.24 looks at the English items' score frequencies. For items 1, 3 and 5 a "1" score was most frequent while for items 2 and 4, a "2" score was most frequent. Responses that received a "4" or highly creative score ranged from 5.3% (E4) to 15.3% (E2). Following these two tables, example responses for each scoring code in the scale are provided.

TABLE 6.23: CONTEXT DEPENDENT TASK: ENGLISH ITEMS MEAN SCORES AND STANDARD DEVIATIONS

Items	Mean	SD
Item E1	1.47	1.0
Item E2	2.39	0.97
Item E3	1.90	1.07
Item E4	1.85	0.82
Item E5	1.46	0.87
Cumulative average for all 5 items: 9.07		

TABLE 6.24: CONTEXT DEPENDENT TASK: ENGLISH ITEMS SCORE FREQUENCIES

Item E1	Frequency	%	Item E2	Frequency	%	Item E3	Frequency	%
0	9	6.9	0	2	1.5	0	2	1.5
1	75	58.1	1	17	13.0	1	54	41.3
2	61	17.6	2	57	43.5	2	43	32.8
3	18	5.3	3	29	22.1	3	7	5.3
4	16	7.6	4	20	15.3	4	19	14.5
Item E4	Frequency	%	Item E5	Frequency	%			
0	-	-	0	1	.8			
1	45	34.4	1	87	66.4			
2	60	45.8	2	25	19.1			
3	13	9.9	3	3	2.3			
4	7	5.3	4	9	6.9			

The following are examples of those that were given a “4” score (English version):

The school festival was suppose to be a fun occasion, but when the teacher saw the students painting on the walls he got really angry. He ... *is weather in the mountains*. (Item E4, subject 48)

In writing class, Mary has been told to look into her past and ... *bring from old shelf* ... some of her memories for there is a lot of good drama there. (Item E1, subject 111)

The following is an example of one that was given a “3” score (English version):

After graduating from university, he has not been able to find a job. But still he bought a new car and a lot of new clothes. Now he has a lot of credit card debt and worries. He ... *is now standing on the edge of hell*. (Item E2, subject 123)

The following are examples of those that were given a “2” score (English version):

I met this really great girl or boy last night. We went out and had a great time. When I got home I couldn't sleep. She or he really ... *is an angel*. (Item E5, subject 59)

The school festival was suppose to be a fun occasion, but when the teacher saw the students painting on the walls he got really angry. He ... *is like an exploded bomb*. (Item E4, subject 95)

The following are examples of those that were given a “1” score (English version):

In writing class, Mary has been told to look into her past and ... *notice* ... some of her memories for there is a lot of good drama there. (Item E1, subject 5)

Yesterday in Odaiba, AKB48 came to sign autographs for their fans. There were so many people waiting outside and when they finally opened up the gate to let the fans approach the tables, ... *it was panic*. (Item E3, subject 4)

The Context Dependent Task: Japanese

Similar to the English version, the participants had to complete 5 sentences that primed them to use a metaphor. Then each sentence was coded. For instance, the first Japanese sentence was coded J1 and the next one J2 and subsequent ones followed this pattern.

Table 6.25 provides the Japanese items' mean scores and standard deviations for each of the 5 sentences in this section and the total average cumulative score for all 5 items.

Table 6.26 looks at the Japanese items' score frequencies.

TABLE 6.25: CONTEXT DEPENDENT TASK: JAPANESE ITEMS MEAN SCORES AND STANDARD DEVIATIONS

<b>Items</b>	<b>Mean</b>	<b>SD</b>
Item J1	1.96	.90
Item J2	2.03	.90
Item J3	1.95	1.0
Item J4	1.67	.99
Item J5	1.74	.82
Cumulative average for all 5 items: 9.35		

TABLE 6.26: CONTEXT DEPENDENT TASK: JAPANESE ITEMS SCORE FREQUENCIES

<b>Item J1</b>	<b>Frequency</b>	<b>%</b>	<b>Item J2</b>	<b>Frequency</b>	<b>%</b>	<b>Item J3</b>	<b>Frequency</b>	<b>%</b>
1	40	30.8	1	36	27.7	1	48	36.9
2	67	51.5	2	66	50.8	2	59	45.4
3	7	5.4	3	12	9.2	3	1	.8
4	14	10.8	4	14	10.8	4	20	15.4
<b>Item J4</b>	<b>Frequency</b>	<b>%</b>	<b>Item J5</b>	<b>Frequency</b>	<b>%</b>			
0	1	.8	0	-	-			
1	74	56.9	1	54	41.5			
2	32	24.6	2	62	47.7			
3	8	6.2	3	3	2.3			
4	13	10	4	9	6.9			

The following are examples of those that were given a “4” score (Japanese version):

His parents had many expectations that their son would be successful, so they got him into an expensive private university. But rather than studying hard, he began to party every night and in the end he had to drop out of school. His parents dream ... *scattered like a snowstorm of torn up paper.* (両親は、息子の成功へ期待を多く抱いていたので、彼らは高い私立大学に息子を入学させた。しかし、彼は一生懸命勉強せず、パーティーで一晩中外出し始め、最終的には学校を中退した。両親の夢は。。。紙吹雪のように散った。) (Item J3, subject 14)

When she was asked by her friend to give a speech at her wedding, she ... *became a sparrow and quickly flew off.* (結婚披露のスピーチを友達に頼んだら、彼女は。。。雀になり、素早く逃げ去った。) (Item J2, subject 66)

The following is an example of one that was given a “3” score (Japanese version):

It was really exciting for I was competing against the top-level skaters in the world in the Olympics. So I will never forget this experience. This experience ... *is more valuable than the Pacific Ocean.* (本当にワクワクしている。なぜなら世界で最高のスケーターと競うためにオリンピックに来たからだ。そして、私はこの経験を決して忘れません。この経験は。。。太平洋よりも大きな価値がある。) (Item J4, subject 103)

The following are examples of those that were given a “2” score (Japanese version):

She has a beautiful voice. Whenever I hear her voice, I think of ... *the chirping of a bird in the morning.* (彼女は素晴らしい声を持っています。私が彼女の歌声を聞く時はいつでも、。。。朝にさえずる小鳥。。。を想像する。) (Item J1, subject 122)

When I passed the university entrance exam, my parents ... *looked like popcorn jumping around.* (私の両親が、私の大学入学試験合格をした時、彼らは。。。ポップコーンみたいに飛び跳ねた。) (Item J5, subject 38)

The following are examples of those that were given a “1” score (Japanese version):

She has a beautiful voice. Whenever I hear her voice, I think of ... *an angel*. (彼女は素晴らしい声を持っています。私が彼女の歌声を聞く時はいつでも、。。。天使。。。を想像する。) (Item J1, subject 7)

It was really exciting for I was competing against the top-level skaters in the world in the Olympics. So I will never forget this experience. This experience ... *is my treasure*. (本当にワクワクしている。なぜなら世界で最高のスケーターと競うためにオリンピックに来たからだ。そして、私はこの経験を決して忘れません。この経験は。。。私の宝物。) (Item J4, subject 63)

Many responses fit well into the four scoring categories and therefore little disagreement arose between the evaluators in these cases. Distinguishing differences between creative responses and conventional responses was rather transparent. The discrepancies mostly involved a single score unit (e.g., 1 to 2 or 3 to 4) and rarely involved a double or triple score unit (e.g., 1 to 3 or 4). Where there were disagreements, the evaluators were able to discuss the differences and jointly reach an agreeable score. Despite the relatively smooth process of scoring these responses, a couple of issues did arise: (1) To what degree of an extension on a conventional response is necessary for this response to score higher than the other highly conventional responses? (2) What kind of borrowing occurred between the L1 and the L2? For instance, could some of the responses that were written in English and given a creative score by the native English speaking evaluators, in fact, simply be a direct translation of some conventional expression in the L1? Such issues need to be recognized as possible limitations of this assessment method.

#### 6.4.2.3 Summary of the Metaphor Assessment Section

The *context independent task* showed to a certain degree that creativity could be reliably recognized by a group of independent raters. This assessment closely resembles the ones used in the literature on creativity, most notably the consensual assessment technique, as outlined by Amabile (1996). In this situation, the raters acted completely independent to assess the metaphors. On the other hand, the *context dependent task*, which relied more on the assessment technique used by Littlemore (1998), employed a slightly different set of coding criteria. Moreover, since this task did not directly prompt the participants to produce a metaphor, a fourth scoring item was added to account for the larger range of possible responses. The assessment process differed also by the fact that the raters worked more closely together and corroborated on the scoring of these responses.

### 6.5 SUMMARY OF CHAPTER 6

In this chapter, I first described the participants and procedure for collecting the data in the main study. Then I provided a detailed description of the various instruments. I explained in depth the consensual assessment technique used in scoring both the metaphor tasks and creative products. This technique was shown to have good reliability as way to measure creativity of a product both in the form of a drawing, a poem, and a metaphor. In this chapter, I also presented the descriptive statistics for the various questionnaires developed for the main study. In summary, as shown in this chapter, there were a number of variables used in the main study in order to measure metaphor production in an L1 and L2, as well as creativity. In order to organize these variables, I have arranged them in Table 6.27. Each variable has a code that is an abbreviated

description of it. In the next chapter, I examine the results of the main study through the use of inferential statistics that explore the relationships between these variables and discuss possible ways to interpret these results.

TABLE 6.27: FINAL VARIABLES USED IN THE MAIN STUDY FOR ANALYSIS

<b>Language Variables</b>	<b>Code</b>
TOEIC score	TOEIC
Vocabulary score	VOCAB
<b>Metaphor Creativity Variables</b>	<b>Code</b>
English Context Independent Metaphor Score – Fluency	ECIMS_F
English Context Independent Metaphor Score – Creativity	ECIMS_C
Japanese Context Independent Metaphor Score – Fluency	JCIMS_F
Japanese Context Independent Metaphor Score – Creativity	JCIMS_C
English Context Dependent Metaphor Score	ECDMS
Japanese Context Dependent Metaphor Score	JCDMS
<b>Creativity Variables</b>	<b>Code</b>
16 items in the Five Factor Model Creative Personality Questionnaire	FFM_CPQ
24-item Creative Personality Questionnaire	CPQ
24-item CPQ – Self-Efficacy	CPQ_SE
24-item CPQ – Persistent Motivation	CPQ_PM
24-item CPQ – Intolerance of Ambiguity	CPQ_IA
24-item CPQ – Exploratory Motivation	CPQ_EM
34-item Past Creative Achievements Questionnaire	ACHIEV
24-item Creative Self Beliefs Questionnaire	SELFBIO
The Creative Drawings	CP_DRAWING
The Creative Drawing 1 – Originality	CP_DRAWING_O
The Creative Drawing 2 – Fluency	CP_DRAWING_F
The Creative Poem	CP_POEM

## **Chapter 7 Results and Discussion**

### **7.1 INTRODUCTION**

In Chapter 6, descriptions and methods of scoring each of the creativity measurements and creative metaphor tasks were analyzed in detail. There were two types of measurements. One type used a questionnaire format to measure personality items, past creative achievements, and one's own beliefs in one's creative abilities. The second type used a production task such as writing a poem, drawing a picture, or completing a metaphor in both the L1 and L2. This second set of measurements relied on the social side of creativity for it utilized a group of individuals who acted like gatekeepers and evaluated the creativity of the participants' responses. Such a model of evaluating creativity has a long history in the field of creativity research and usually is labeled, the Consensual Assessment Technique (see Chapter 5). Now with this large set of variables, this chapter aims to look at the intercorrelations between them and gain a deeper understanding of the multifaceted nature of creativity and the cognitive ability to produce and interpret creative metaphors between a first and second language.

This chapter is divided into two main parts:

- The results and
- Discussion

The first part, which looks specifically at the results from the main study, is further divided into three sections. In the first section, I examine the creativity instruments

looking for intercorrelations between the numerous variables. Then I perform a multiple regression analysis with the aim of finding predictor variables for the real-life creativity measurement (past creative achievements). In the second section, I examine the two creative metaphor instruments in Japanese (L1) and English (L2). In both of these two sets of data, I first analyze the correlations between the L1 and L2 and then perform a t-test to look more closely at the differences in the scores between them. Finally in the third section, I explore the relationships between the various measurements based on the creativity instruments with the creative metaphor scores. Then in the second part of this chapter, I discuss these results and possible interpretations of them.

## 7.2 RESULTS

As indicated in Chapter 6, there were two types of measurements collected from the participants.

- Measurements for creativity and
- Measurements for creative metaphor production in an L1 and L2

These measurements are shown in Table 7.1 along with the code in parenthesis, which is used in the subsequent tables in this chapter.

TABLE 7.1: TOTAL SET OF TASKS IN THE MAIN STUDY AND VARIABLES USED FOR ANALYSIS

Creativity Tasks (Self-report measures)	Creativity Tasks (Production + Consensual Assessment)	Creative Metaphor Competence Tasks (Production + Consensual Assessment)
16-items Five Factor Model Creative Personality Questionnaire (FFM_CPQ)  24-item Creative Personality Questionnaire <ul style="list-style-type: none"> <li>• Self-Efficacy (CPQ_SE)</li> <li>• Persistent Motivation (CPQ_PM)</li> <li>• Tolerance of Ambiguity (CPQ_TA)</li> <li>• Exploratory Motivation (CPQ_EM)</li> </ul> 34-item Creative Achievements Questionnaire (ACHIEV)  24-item Creative Self-Beliefs Questionnaire (SELFBIO)	The Creative Drawings (CP_DRAWING)  The Creative Drawing 1 – Originality (CP_DRAWING_O)*  The Creative Drawing 2 – Fluency (CP_DRAWING_F)*  The Creative Poem (CP_POEM)  * These scores do not use consensual assessment, but rather a score based on the statistical uniqueness of the drawing or a cumulative score based on total number of drawings.	English Context Independent Metaphor Score – Fluency (ECIMS_F)*  English Context Independent Metaphor Score – Creativity (ECIMS_C)  Japanese Context Independent Metaphor Score – Fluency (JCIMS_F)*  Japanese Context Independent Metaphor Score – Creativity (JCIMS_C)  English Context Dependent Metaphor Score (ECDMS)  Japanese Context Dependent Metaphor Score (JCDMS)  * These scores do not use consensual assessment, but rather are cumulative scores based on total number of responses to a metaphor prompt.

Hypotheses Involving the Creativity Measurements

Creativity involves a number of interacting components (see Rhodes, 1961). The process of generating a creative product is one of these components and is often used to measure an observable variable that represents an individual’s creative potential. In this study, a poem and two drawings were used as the creative products. It is necessary to distinguish when analyzing the creativity variables between measuring creative potential, or possible traits or abilities that may lead to higher levels of creativity and creative achievement, which refers to real-life past creative achievements, as assessed by means of a

biographical measure (Eysenck, 1993; 1995). Therefore creative potential refers to predictors that may then result in creative achievement. In this approach then, creative potential measurements like DT tests (see Runco, 2010) or similarly designed creative product tasks are commonly viewed as independent variables. On the other hand, creative achievement refers to an individual's past behavior in specific domains of experience (see Silvia et al., 2012; Carson et al., 2005). This variable more closely resembles "real-life" creativity and is the dependent variable in this model. Previous studies have also used a similar approach to distinguishing creative potential from creative achievement (Jauk et al. 2013; Jauk et al. 2014). In short, creative potential measures can be viewed as independent variables that may provide some predictive strength to the dependent variable, creative achievement. Creative potential in this main study used various creative products, as noted above, which required the participants to generate or produce something original and useful. Moreover, various creative personality measures were also used to measure creative potential. These measures are self-reporting measures that look at several creative traits like motivation, persistence, tolerance of ambiguity, and openness to experience, as well as, one's own self-reported estimations of one's creativity.

Below are a number of hypotheses for the main study in regards to the creativity measurements:

- **(HC1) Hypothesis 1:** Scores measured by the Five-Factor Model of the Creative Personality Questionnaire (FFM\_CPQ) and the personality traits (Self-efficacy, Persistent Motivation, Tolerance of Ambiguity, and Exploratory Motivation) in

the Creative Personality Questionnaire (CPQ) will be positively correlated with each other and display convergent validity.

- **(HC2) Hypothesis 2:** Scores measured by the FFM\_CPQ and items in the CPQ will be positively correlated with the levels of creativity reported in the SELFBIO and ACHIEV self reports and scores from the creative products (verbal: poem; figural: 2 drawings).
- **(HC3) Hypothesis 3:** Scores measured by the creative products (verbal: poem; figural: 2 drawings) will be positively correlated with the SELFBIO and ACHIEV self reports.
- **(HC4) Hypothesis 4:** Scores measured by the various independent observable measurements collected in this study (FFM\_CPQ, CPQ, SELFBIO, and Creative Products) will have some significant predictability of the dependent variable, ACHIEV.

In short, it was assumed that since all of these variables were measuring different facets of creativity (personality, potential, product), they should all show signs of being related with one another. The SELFBIO instrument was one variable among the above sets of variables that could have shown some signs of not being related to the others. This assumption is based on the issue regarding the reliability of self-reports, especially in regards to self-beliefs in one's ability. Although the ACHIEV form was also a self-report questionnaire, this one dealt with past experiences, which are more concrete and rely on memory recall to complete, while the SELFBIO self-report could have been more easily inflated.

#### Hypotheses Involving the Creative Metaphor Tasks

In Chapter 3, it was suggested that metaphors lie on a continuum from the highly conventional and familiar to the novel and creative. The more conventional a metaphor

is, the more likely it has been codified in the mental lexicon and consequently relies on memory retrieval for processing. In contrast, creative metaphors defamiliarize the reader through the use of novel connections between disparate semantic domains, but despite this unusual or surprising association, the metaphor still elicits meaning and therefore is seen as having value. The metaphors produced in this study were deliberate, insofar as the participants were asked to produce a metaphor in order to complete the particular tasks. The metaphors, similarly to the creative products, were assessed by a group of evaluators for creativity. Creativity was operationalized as having novelty and value. Value refers to the ability to retrieve or uncover meaning in the metaphor. In the main study, the participants were explicitly asked to produce creative metaphors.

Below are a number of hypotheses for the main study in regards to the creative metaphor tasks:

- **(HCM1) Hypothesis 1:** Scores on the two metaphor tasks will show a positive relationship between the two languages.
- **(HCM2) Hypothesis 2:** Scores on the two metaphor tasks in the L1 and the L2 will not be significantly different from one another.
- **(HCM3) Hypothesis 3:** The vocabulary test scores and self-reported TOEIC scores will show a positive relationship with the L2 metaphor tasks, but not the L1 metaphor tasks.

#### Hypotheses Involving the Creative Instruments and Creative Metaphor Tasks

Previous research has aimed to look for relationships between metaphoric competence and various individual differences. For instance, Silva and Beaty (2012; Beaty & Silvia, 2013) found that fluid intelligence (Gf) and broad retrieval ability (Gr) had a stronger

effect on the production of novel metaphors than conventional metaphors to which they conclude “creative metaphors rely more on executive processes, whereas conventional metaphors primarily draw from acquired vocabulary knowledge” (2013; p. 255).

Littlemore (1998, 2001) also explored the relationship between metaphoric competence and various learning and communicative strategies and found a number of correlations, which suggests the cognitive dimension of metaphoric competence, especially in regards to creative metaphors. Therefore this study aimed to further explore the possible relationships between metaphor production and various instruments developed to measure creativity.

Below are a number of hypotheses for the main study regarding the relationships between the creative instruments and the creative metaphor tasks:

- **(HC-CM1) Hypothesis 1:** Scores on the creative metaphor tasks will show a positive relationship with scores from the creative products.
- **(HC-CM2) Hypothesis 2:** Scores on the creative metaphor tasks will show a positive relationship with the various creative personality traits.
- **(HC-CM3) Hypothesis 3:** Scores on the creative metaphor tasks will show a positive relationship with real-life creativity.

The next subsection describes the procedure for preparing the data for the final analysis and assumptions for conducting the respected tests.

#### 7.2.1 PREPARING THE DATA FOR ANALYSIS

In this study all the data for each of the variables were entered into SPSS 24 as ordinal measurements. Using ordinal measurements fulfills one of the assumptions to use

parametric tests. Parametric tests have more statistical power than nonparametric tests insofar as being able to detect a difference that truly exists and are less likely to make a Type II error or an error that fails to reject the null hypothesis when in fact it is false. The other assumptions that need to be fulfilled are the following:

- Random independent samples
- Normally distributed
- No extreme outliers
- Homogeneity of variance
- Large enough sample size

The data was collected from a random sample and the sample size was large enough to conduct a parametric test. There were only two extreme outliers in the Past Creative Achievements Scale and none in the other measures. As for normal distribution, the measures of creative personality and creative self-beliefs were all normally distributed, whereas Figure 7.1 shows the distributions of the past creative achievements scores. This scale displayed positive skewness (skewness = 0.94,  $p < .01$ ; kurtosis = 1.12,  $p < .01$ ), yet this is predicted by theory and has been shown to be the case in previous research that used a similar creative achievement questionnaire (Jauk et al., 2014).

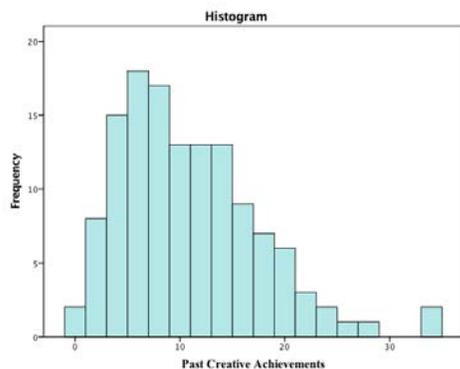


Figure 7.1 Frequency distributions of the Past Creative Achievements Scale

In the following three subsections of this part of the chapter, I first present the results from the creativity instruments, then those from the creative metaphor tasks, and finally I examine the relationships between the creativity measurements and the creative metaphor tasks.

## 7.2.2 RESULTS FROM THE CREATIVITY INSTRUMENTS

This research was exploratory in nature and sought to find correlations between a broad set of variables. Therefore I initially analyzed the correlations between the 11 creativity instruments. Table 7.2 displays the descriptive statistics and correlations between the observed variables for these instruments.

TABLE 7.2: DESCRIPTIVE STATISTICS AND INTERCORRELATIONS FOR THE CREATIVITY INSTRUMENTS.

	Min, Max	M (SD)	1	2	3	4	5	6	7	8	9	10	11
1. FFM_CPQ	5, 53	27.73 (10.55)	1										
2. CQP_SE	5, 32	17.12 (5.80)	.79**	1									
3. CQP_PM	2, 23	13.33 (4.25)	.53**	.41**	1								
4. CQP_TA	8, 32	18.64 (4.99)	.64**	.57**	.33**	1							
5. CQP_EM	13, 30	23.76 (3.67)	.61**	.49**	.36**	.53**	1						
6. ACHIEV	0, 34	10.32 (6.66)	.46**	.38**	.21*	.27**	.36**	1					
7. SELFBIO	56, 230	146.76 (39.56)	.35**	.33**	.22*	.21*	.11	.32**	1				
8. CP_DRAW	6, 35	18.69 (7.02)	.16	.17	.14	.12	.29**	.19*	.06	1			
9. CP_DRAWO	1, 6	3.54 (1.78)	.15	.16	.13	.18*	.14	.15	.02	.50**	1		
10. CP_DRAWF	1, 6	2.40 (1.37)	.01	.09	.05	-.01	.08	.09	.08	.57**	.12	1	
11. CP_POEM	9, 26	17.06 (3.66)	.01	-.03	-.01	.05	.22*	.01	-.12	.26**	.16	.12	1

\*\* Correlation is significant at the 0.01 level

\* Correlation is significant at the 0.05 level

**(HC1) Hypothesis 1:** Scores measured by the Five-Factor Model of the Creative Personality Questionnaire (FFM\_CPQ) and the personality traits (Self-efficacy, Persistent Motivation, Tolerance of Ambiguity, and Exploratory Motivation) in the Creative Personality Questionnaire (CPQ) will be positively correlated with each other and display convergent validity.

Not surprisingly, the Five-factor model of the Creative Personality Questionnaire

(FFM\_CPQ) showed convergent validity with the various factors in the 24-item Creative

Personality Questionnaire (CPQ). For instance, FFM\_CPQ showed positive and significant correlation with self-efficacy (0.79,  $p < .01$ ), persistent motivation (0.53,  $p < .01$ ), exploratory motivation (0.61,  $p < .01$ ), and tolerance of ambiguity (0.64,  $p < .01$ ). This was to be expected since all of these constructs are designed to measure theoretically the multifaceted nature of the creative personality.

**(HC2) Hypothesis 2:** Scores measured by the FFM\_CPQ and items in the CPQ will be positively correlated with the levels of creativity reported in the SELFBIO and ACHIEV self reports and the scores from creative products (verbal: poem; figural: 2 drawings).

In support of HC2, the FFM\_CPQ showed strong and significant correlation with the SELFBIO (0.35,  $p < .01$ ) and ACHIEV (0.46,  $p < .01$ ) self reports. This corresponds to findings from numerous previous studies that have also shown the strong relationship between Openness to Experience (one of the five personality types in the five factor model and the trait most heavily represented in the FFM\_CPQ) and various aspects of creativity (Feist, 1998, 2010; Nusbaum & Silvia, 2011; see Batey & Furnham, 2006 for a detailed review). The difference here is that the FFM\_CPQ was developed from a bottom-up perspective within the local environment of the present study. That is to say, a group of Japanese students in northern Japan (where this main study took place) were asked to select from a more comprehensive five-factor model questionnaire, the traits that they felt were most prominent in a creative person (see Chapter 5 for an in-depth explanation of the development of this questionnaire). Therefore this questionnaire is grounded within the local, social, linguistic, and cultural environment.

Moreover, as expected, the factors in the CPQ (SE – self efficacy, PM – persistent motivation, TA – tolerance of ambiguity, and EM – exploratory motivation) also showed

positive and significant correlations with the SELFBIO (SE 0.33,  $p < .01$ ; PM 0.22,  $p < .05$ ; TA 0.21,  $p < .05$ ) and ACHIEV (SE 0.38,  $p < .01$ ; PM 0.21,  $p < .05$ ; TA 0.27,  $p < .01$ ; EM 0.36,  $p < .01$ ) self reports. It should be noted here that only Exploratory Motivation did not show any sign of positive significant correlation with the SELFBIO scale.

Surprisingly and at odds with the hypothesis, the only personality trait that correlated with one of the creative products was Exploratory Motivation, which correlated with the CP Drawing (0.29,  $p < .01$ ) and the CP Haiku Poem (0.22,  $p < .01$ ). The other personality measures showed no signs of significant correlations with these two creative products.

**(HC3) Hypothesis 3: Scores measured by the creative products (verbal: poem; figural: 2 drawings) will be positively correlated with the SELFBIO and ACHIEV self reports.**

In contrast to the hypothesis, the creative products, CP Drawing and CP Haiku, showed limited significant correlations to the SELFBIO/ACHIEV self reports. For instance, only the CP Drawing significantly correlated with ACHIEV (0.19,  $p < .05$ ), but did not with the SELFBIO. Moreover, the CP Haiku did not correlate with either the SELFBIO or ACHIEV self reports. It should be noted here that the CP Drawing and CP Haiku (0.26,  $p < .01$ ) positively and significantly correlated with each other, despite the two involving different modalities: verbal and visual. This is surprising, since previous studies (Torrance, 1990a as cited in Cramond, Matthews-Morgan, Bandalos, & Zuo, 2005 p. 284) that have mainly focused on divergent thinking tasks in the different modes (verbal/figural) have found little correlations between the two. This study used a different verbal task in the form of a Haiku creative product, as compared to a DT task that might ask, “Come up with *unusual uses* for a brick” (see Chapter 4.1.1 for more detailed

explanation of DT tasks). Moreover the verbal task (Haiku) in this study was consensually assessed by a group of judges. The correlations between these two creative products (verbal/figural) might point to the *domain* specificity of creativity and reflect an overall artistic creativity measurement that the DT verbal tasks fail to assess. To again reflect on possible reasons why these creative products failed to correlate with the SELFBIO and the ACHIEV self-reports is the fact that these self-reports are very broad in scope covering a number of diverse domains of creative experiences such as science, drama, and everyday creativity and might reflect more of a *general* creativity.

**(HC4) Hypothesis 4:** Scores measured by the various independent observable measurements collected in this study (FFM\_CPQ, CPQ, Self-Bio, and Creative Products) will have some significant predictability of the dependent variable, ACHIEV.

Multiple regression analyses were conducted to examine the relationship between the outcome (dependent variable), which in this case, is past creative achievement and the various potential predictor variables like personality, self-bio and the creative products. In this study, most of the variables did not contribute to the multiple regression model. The Five-factor model of the Creative Personality (FFM\_CPQ) and SELFBIO scales were the only two independent variables that showed any significant predictability. For instance, in Model 1, a significant regression equation was found ( $F(1,128) = 34.840$ ,  $p < 0.00$  with an  $R^2 .214$ ). In this case, participants' predicted creative achievement is equal to  $2.322 + .292$  (FFM\_CPQ). That is to say, participants' creative achievement scores increased .292 with every additional point scored on this personality scale. In addition, 21.4% of variability in the Creative Achievement scores can be explained by the Five-Factor Model of the Creative Personality (FFM\_CPQ). In Model 2, a significant

regression equation was found ( $F(2,127) = 20.534, p < 0.00$  with an  $R^2 .244$ . Table 7.3 summarizes the findings in these two models.

TABLE 7.3: SUMMARY OF REGRESSION EFFECTS (CREATIVITY ACHIEVEMENTS AS DEPENDENT VARIABLE).

Model	Predictor	$\beta$	Std. error	p value	95% Confidence interval
1. FFM_CPQ only	FFM_CQP	.463	.052	.000	.188, .395
2. FFM_CPQ and SELFBIO	FFM_CQP	.398	.055	.000	.143, .360
	SELFBIO	.186	.015	.034	.002, .060

n = 130

Figure 7.2 shows two scatter plots with creativity as measured by Past Creative Achievements on the Y-axis. In the left scatter plot, FFM\_CPQ is on the X-axis, and on the right scatter plot, SELFBIO is on the X-axis.

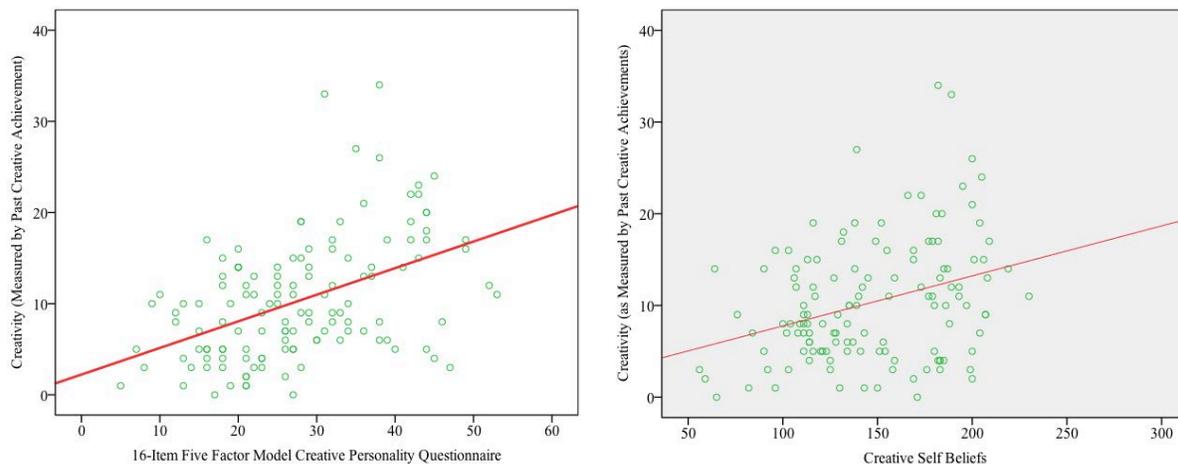


Figure 7.2: A scatter plot with creativity as measured by past creative achievements and the FFM\_CPQ (left figure) and SELFBIO (right figure)

In summary, the Five Factor Model of the Creative Personality (FFM\_CPQ) and the Creative Self-Beliefs Scale (SELFBIO) both showed good predictability of past creative achievements. This suggests that the FFM\_CPQ is a valid questionnaire to measure important personality traits crucial for creativity. In addition, this data also

shows that people are aware of their own creativity and can reliably assess it in a variety of domains. The second creative personality questionnaire (CPQ) failed to show any predictability and needs to be reevaluated and further tested. Surprisingly, the creative products also failed to show any predictability for past creative achievements for they also showed minimal correlations with the other variables in this study, as previously mentioned. This is considered in greater depth in the discussion section of this chapter. Next in the following subsection, I present the results from the creative metaphors tasks.

### 7.2.3 RESULTS FROM THE CREATIVE METAPHOR PRODUCTION TASKS

In this section, I examine the relationship between the Japanese and English scores on the creative metaphor tasks. Again, in this thesis I considered the possibility that if an individual has a tendency or disposition towards producing creative metaphors in an L1, this then would likely appear also in the L2. If this is the case, then participants in this study who scored high on the L1 creative metaphor tasks should also score high on a similar task in the L2.

**(HCM1) Hypothesis 1: Scores on the two metaphor tasks will show a positive relationship between the two languages.**

As predicted by HCM1, scores between the two languages displayed a significant positive correlation (0.23,  $p < .01$ ) for the *context independent metaphor task*. Table 7.4 provides the descriptive statistics for the scores on this task in the L1 and L2 and the intercorrelations between the two scores.

TABLE 7.4: PAIRED SAMPLES STATISTICS AND CORRELATIONS FOR THE CREATIVITY SCORES ON THE CONTEXT INDEPENDENT METAPHOR TASK IN JAPANESE AND ENGLISH

	Mean	N	Std. Deviation	Std. Error Mean	Correlation	Sig.
JCIMS_C	9.59	128	2.776	.245	.231	.000
ECIMS_C	11.78	124	2.707	.243		

As for the *context dependent task*, Table 7.5 provides the descriptive statistics for the scores in the L1 and L2 and the intercorrelations between the two scores and a significant positive correlation (0.32,  $p < .01$ ) was found between the two languages.

TABLE 7.5: PAIRED SAMPLES STATISTICS AND CORRELATIONS FOR THE CREATIVITY SCORES ON THE CONTEXT DEPENDENT METAPHOR TASK IN JAPANESE AND ENGLISH

	Mean	N	Std. Deviation	Std. Error Mean	Correlation	Sig.
JCDMS	9.34	128	2.785	.246	.324	.000
ECDMS	9.07	124	2.794	.251		

When these two sets of data are arranged together into one correlational table (see Table 7.6), the creative metaphor scores between the tasks show strong relationships. For instance, the Japanese Context Independent Metaphor Score (JCIMS\_C) displayed a significant positive correlation with the English Context Independent Metaphor Score (ECIMS\_C) (0.23;  $p < .01$ ), the Japanese Context Dependent Metaphor Score (JCDMS) (0.28;  $p < .01$ ), and English Context Dependent Metaphor Score (ECDMS) (0.20;  $p < .05$ ). So despite the different types of tasks and different languages used to complete them, positive correlations were observed.

TABLE 7.6: INTERCORRELATIONS FOR THE SCORES ON THE CONTEXT INDEPEDNET AND DEPENDENT METAPHOR TASKS IN JAPANESE AND ENGLISH

	1	2	3	4
1. JCIMS_C	1			
2. ECIMS_C	.231**	1		
3. JCDMS	.282**	.392**	1	
4. ECDMS	.203*	.266**	.324**	1

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

While these results suggest that creative metaphor production and interpretation, as developed in these metaphor tasks, between an L1 and L2, share some cognitive ability, the results should also be approached with some caution for this research is exploratory in nature and extraneous variables could be contaminating the data. For instance, a number of limitations arise from these metaphor tasks such as:

- The choice of topics to prime the participants to produce the metaphor in the respected languages could have influenced or affected the participants' responses.
- The time spent on the task was not recorded.
- There are a limited number of prompts in the *context independent task* (only 2 in each language) and the *context dependent task* (5 in each language).

**(HCM2) Hypothesis 2:** Scores on the two metaphor tasks in the L1 and the L2 will not be significantly different from one another.

In order to examine the differences between the participants' overall scores in the L1 and L2 on these creative metaphor tasks, I performed a paired-samples t-test. This includes looking at fluency and creativity for the context independent metaphor tasks and only the overall creative score for the context dependent metaphor tasks. Tables 7.7 and 7.9 provide the results for the creativity and fluency scores respectively. Table 7.8 provides the descriptive statistics for the fluency scores (since these scores were not introduced earlier). Cohen's *d* and effect size *r* are two possible ways to measure effect size in a study. Effect size compares two mean scores; in this case Japanese (L1) and English (L2) scores on a metaphor task, and considers the standard deviations. Using only significance is problematic due to its inherent bias towards large sample sizes. Cohen (1988) argued that significance test and effect size are both crucial for determining the probability that a phenomenon exists or not.

TABLE 7.7: PAIRED SAMPLES TEST FOR THE CREATIVITY SCORES ON THE CONTEXT INDEPENDENT METAPHOR TASK IN JAPANESE AND ENGLISH

	Paired Differences							
	M	SD	Std. Error	95% confidence Interval		t	df	Sig. (2-tailed)
JCIMS_C ECIMS_C	-2.169	3.421	.307	-2.777	-1.561	-7.061	123	.000

Cohen's  $d = 0.787$  (effect size  $r = 0.366$ ) (<http://www.uccs.edu/~lbecker/>)  
 Cohen's  $d > 0.2 =$  small;  $0.5 =$  medium;  $0.8 =$  large (Cohen, 1977)  
 Pearson  $r > 0.1 =$  small;  $0.3 =$  medium;  $0.5 =$  large

TABLE 7.8: PAIRED SAMPLES STATISTICS AND CORRELATIONS FOR THE FLUENCY SCORES ON THE CONTEXT INDEPENDENT METAPHOR TASK IN JAPANESE AND ENGLISH

	Mean	N	Std. Deviation	Std. Error Mean	Correlation	Sig.
JCIMS_F	8.99	124	3.510	.315		
ECIMS_F	6.64	124	2.611	.234	.567	.010

TABLE 7.9: PAIRED SAMPLES TEST FOR THE FLUENCY SCORES ON THE CONTEXT INDEPENDENT METAPHOR TASK IN JAPANESE AND ENGLISH

	Paired Differences							
	M	SD	Std. Error	95% confidence Interval		t	df	Sig. (2-tailed)
JCIMS_F ECIMS_F	2.355	2.958	.266	1.829	2.881	8.864	123	.000

Cohen's  $d = 0.760$  (effect size  $r = 0.355$ )

There was a significant difference between the Japanese (L1) context independent metaphor creativity scores ( $M=9.59$ ,  $SD=2.78$ ) and the English (L2) scores ( $M=11.78$ ,  $SD=2.71$ ) conditions;  $t(123)=-7.061$ ,  $p<.00$ . These results were unexpected since intuitively one would likely presume that individuals would score higher in their first language. Yet the opposite occurred when simply measuring the fluency of responses in this task (L1  $M=8.89$ ,  $SD=3.54$ ; L2  $M=6.64$ ,  $SD=2.61$ ;  $t(123)=-0.864$ ,  $p<.00$ ). So these results suggest that in the L1, one can come up with more responses, but these responses are scored as being less creative. Why would this occur? One possibility is that the raters for the Japanese version gave lower overall scores than the raters for the English version. To minimize this possibility, I used multiple independent raters, so they did not influence

each other. Despite this independence in evaluating the responses, there was still good inter-rater reliability between the different raters (see Chapter 6). A more likely possibility for this difference is that in an L1, salience and conventionality have a greater effect on the language user, thereby increasing the participants' fixedness and reducing one's creativity. In the L2, the language is less known, less conventional and therefore does not have this effect and one is less influenced by salient and highly familiar responses. I further elaborate on these findings later in the discussion section of this chapter.

In regards to the scores for the context dependent metaphor task, Table 7.10 shows the results from the t-test. As predicted, there was no significant difference in the scores for the Japanese (L1) context dependent metaphor scores (M=9.34, SD=2.46) and for the English (L2) version (M=9.07, SD=2.51) conditions;  $t(122)=1.11$ ,  $p<.27$ .

TABLE 7.10: PAIRED SAMPLES TEST FOR THE CREATIVITY SCORES ON THE CONTEXT DEPENDENT METAPHOR TASK IN JAPANESE AND ENGLISH

	Paired Differences							
	M	SD	Std. Error	95% confidence Interval		t	df	Sig. (2-tailed)
JCDMS ECDMS	.325	3.24	.292	.904	.253	1.113	122	.268

**(HCM3) Hypothesis 3:** The vocabulary test scores and self-reported TOEIC scores will show a positive relationship with the L2 metaphor tasks, but the not the L1 metaphor tasks..

Producing metaphors in an L2 obviously requires some linguistic ability in that language to generate and interpret them. Therefore, I collected two types of data that provided some insight into the participants' English abilities. The first one was a standardized English test (TOEIC), which the participants simply inputted their score into the

questionnaire (if known), and the second was a vocabulary test, which the participants took along with completing the other tasks in this study. Interestingly, the standardized test (TOEIC) showed little relationship with the creative metaphor scores, but showed significant correlation with the metaphor fluency score (0.28,  $p < 0.01$ ) (see Table 7.11). In contrast, the vocabulary test showed significant correlations with the two creative metaphor scores (0.19,  $p < 0.05$ ; 0.22,  $p < 0.05$ ), but not with the metaphor fluency score. Predictably, these two English assessments had no relationship with the Japanese metaphor scores.

TABLE 7.11: INTERCORRELATIONS FOR THE ENGLISH ASSESSMENT AND THE CREATIVE METAPHOR SCORES (ENGLISH ON THE LEFT AND JAPANESE ON THE RIGHT)

	1	2	3	4	5		1	2	3	4	5
1. TOEIC	1					1. TOEIC	1				
2. VOCAB	.25*	1				2. VOCAB	.25*	1			
3. ECIMS_F	.28**	.14	1			3. JCIMS_F	.07	.10	1		
4. ECIMS_C	.14	.19*	.29**	1		4. JCIMS_C	-.13	-.02	.03	1	
5. ECDMS	.04	.22*	.16	.27**	1	5. JCDMS	.05	.12	.19*	.28**	1

\* Correlation is significant at the 0.05 level (2-tailed).

\*\* Correlation is significant at the 0.01 level (2-tailed).

#### 7.2.4 RESULTS FROM THE CREATIVITY INSTRUMENTS AND CREATIVE METAPHOR PRODUCTION TASKS

The final goal of this research was to investigate how the creative metaphor scores correlate with the scores from the creativity instruments. Table 7.12 provides the 11 creativity instruments and 6 metaphor instruments means scores, standard deviations and minimum/maximum scores. Table 7.13 shows the intercorrelations between the variables.

TABLE 7.12: DESCRIPTIVE STATISTICS FOR THE CREATIVITY INSTRUMENTS AND METAPHOR INSTRUMENTS

	M	SD	Min, Max
1. FFM_CPQ	27.73	10.55	5, 53
2. CQP_SE	17.12	5.80	5, 32
3. CQP_PM	13.33	4.25	2, 23
4. CQP_IA	18.64	4.99	8, 32
5. CQP_EM	23.76	3.67	13, 30
6. ACHIEV	10.32	6.66	0, 34
7. SELFBIO	146.76	39.56	56, 230
8. CP_DRAW	18.69	7.02	6, 35
9. CP_DRAWO	3.54	1.78	1, 6
10. CP_DRAWF	2.40	1.37	1, 6
11. CP_POEM	17.06	3.66	9, 26
12. JCIMS_F	8.89	3.54	0, 22
13. JCIMS_C	9.59	2.78	6, 18
14. ECIMS_F	6.64	2.61	2, 19
15. ECIMS_C	11.78	2.71	3, 18
16. JCDMS	9.34	2.51	5, 17
17. ECDMS	9.07	2.46	3, 17

TABLE 7.13: INTERCORRELATIONS FOR THE CREATIVITY AND METAPHOR INSTRUMENTS

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. FFM_CPQ	1																
2. CQP_SE	.79**	1															
3. CQP_PM	.53**	.41**	1														
4. CQP_IA	-.63**	-.56**	-.32**	1													
5. CQP_EM	.61**	.49**	.36**	-.55**	1												
6. ACHIEV	.46**	.37**	.20*	-.25**	.33**	1											
7. SELFBIO	.35**	.33**	.22*	-.23**	.11	.32**	1										
8. CP_DRAW	.16	.17	.14	-.11	.29**	.19*	.06	1									
9. CP_DRAWO	.15	.16	.13	-.16	.14	.15	.02	.51**	1								
10. CP_DRAWF	.01	.09	.05	.01	.08	.09	.08	.56**	.12	1							
11. CP_POEM	.04	-.03	-.01	-.03	.22*	.01	-.12	.26**	.16	.12	1						
12. JCIMS_F	.03	.03	-.10	-.10	.01	-.02	.02	-.07	-.05	.02	.02	1					
13. JCIMS_C	-.12	-.12	-.02	-.02	.02	.08	.02	.26**	.19*	.03	.18*	.03	1				
14. ECIMS_F	-.05	-.10	-.11	-.16	-.16	.12	.08	-.05	.02	.03	-.13	.57**	.01	1			
15. ECIMS_C	.09	.13	.02	-.01	.10	.25**	.01	.12	.18	-.03	.05	.16	.23**	.29**	1		
16. JCDMS	.23*	.17	.29**	.04	.17*	.21*	.14	.27**	.26**	.03	.06	.13	.39**	.19*	.28**	1	
17. ECDMS	-.03	.06	.02	-.01	-.02	.00	.03	.09	.08	.06	.18*	.16	.27**	.11	.20**	.32**	1

\*\* Correlation is significant at the 0.01 level

\* Correlation is significant at the 0.05 level

**(HC-CM1) Hypothesis 1: Scores on the creative metaphor tasks will show a positive relationship with scores on the creative products tasks.**

As indicated in the previous sections, the creative products failed to correlate with most of the other creativity instruments, but the verbal and figural creative products did correlate with each other, which I interpreted as suggesting that these instruments measured a domain specific “artistic creative potential” within the participants. The creative metaphors, as presented above, showed strong correlations between each of the different tasks and across the two different languages. This provides evidence for a general individual difference in one’s competency and/or disposition towards producing creative metaphors. This third and final set of hypotheses investigated the relationships between the creative instruments, for this specific hypothesis (HC-CM1), this entails the creative products and the creative metaphors. In order to more easily read these correlations between the scores on the creativity and metaphor performance tasks, I arranged those with significant correlations in the below format. I did not include the intercorrelations between the metaphor tasks since I already discussed these in the previous section.

**Japanese Context Independent Metaphor Score – Creativity (JCIM\_C)**

- CP\_DRAW (0.26,  $p < 0.01$ )
- CP\_DRAWO (0.19,  $p < 0.05$ )
- CP\_POEM (0.18,  $p < 0.05$ )

**English Context Independent Metaphor Score – Creativity (ECIM\_C)**

- No correlations with any of the creative products

### **Japanese Context Dependent Metaphor Score (JCDMS)**

- CP\_DRAW (0.27,  $p < 0.01$ )
- CP\_DRAWO (0.26,  $p < 0.01$ )

### **English Context Dependent Metaphor Score (ECDMS)**

- CP\_POEM (0.18,  $p < 0.05$ )

The metaphor tasks, particularly the Japanese tasks, showed significant and positive correlations with the creative products. This indicates that these metaphor tasks could be an alternative or additional way to measure creativity, especially in the L1. These creative metaphor tasks require the participants to construct and explore conceptual combinations, which is really the cornerstone of the creative process (see Finke, Ward & Smith, 1992).

**(HC-CM2) Hypothesis 2:** Scores on the creative metaphor tasks will show a positive relationship with the various creative personality traits.

Despite the above results, which showed various metaphor tasks as having significant positive correlations with some of the scores of the creative products, the only metaphor task to show any signs of significant correlations with some of the creative personality scales was the Japanese Context Dependent Metaphor Task. Again this provides good evidence for the validity of using such a task as a way to measure the creative process.

### **Japanese Context Dependent Metaphor Score (JCDMS)**

- FFM\_CPQ (0.23,  $p < 0.05$ )
- CQP\_PM (0.29,  $p < 0.01$ )
- CQP\_EM (0.17,  $p < 0.05$ )

**(HC-CM3) Hypothesis 3:** Scores on the creative metaphor tasks will show a positive relationship with real-life creativity.

Both the Japanese Context Dependent Metaphor Score (JCDMS) and the English Context Independent Metaphor Score – Creativity (ECIMS-C) correlated significantly with real-life creativity, as measured by a self-report of ACHIEV. This provides further verification for the JCDMS as a possible instrument to measure the creative process. It is a little more interesting that ECIMS\_C also correlated with ACHIEV, which might point again to the creative process since this measure relies more on conceptual combination and less on language competence than the ECDMS.

#### **Japanese Context Dependent Metaphor Score (JCDMS)**

- ACHIEV (0.21,  $p < 0.05$ )

#### **English Context Independent Metaphor Score – Creativity (ECIMS\_C)**

- ACHIEV (0.25,  $p < 0.01$ )

To elaborate briefly on these findings there are a number of other things to consider. Firstly, as previously stated, none of the Creative Product instruments showed any signs of significant correlations with the ACHIEV variable. Secondly this variable, which addressed past creative achievements through a self-reported biographical questionnaire, is often viewed as being indicative of creativity for as Hocevar (1981) stated “Past behavior is generally the best predictor of future behavior” (p. 459). This suggests that these metaphor tasks showed a stronger relationship to past creative achievement than the poem or the drawing, which have been commonly used in past research to measure a

creative product. I am not suggesting that these instruments are not effective, but rather it appears that they measure a very specific creative skill related to an artistic domain. In contrast, these metaphor tasks may be more revealing of a more general cognitive process that represents as Miall (1987) mentions the fact that “metaphor shows on a small scale all the principal features of the thought processes that are most significant in creativity” (p. 82). What needs to be further explored is why this occurred in the *context independent task* in the L2 and the *context dependent task* in the L1.

#### 7.2.5 SUMMARY OF THE RESULTS

In this section, I presented the results from the main study in this research. I first separately analyzed the results from the creativity instruments and the creative metaphor tasks and then explored the two sets of variables together. In conclusion, as for the personality scales, the FFM\_CPQ showed to have the strongest relationship with the other creativity instruments and the metaphor tasks. It also had predictive strength for past creative achievements. Although the Creative Products mostly failed to positively and significantly correlate with the other creativity instruments and metaphor tasks, the products correlated with each other and might indicate a more domain specific creative artistic ability. In regards to the metaphor tasks, the four sets of creative metaphor variables between the two languages all significantly correlated with each other. This suggests the possibility of an individual difference or disposition towards novelty and originality when confronted with a prompt to produce a creative metaphor, regardless if this task is in an L1 or L2. One surprising finding to emerge from these metaphor tasks is the fact that the *context independent task* showed significant difference in scores between the L1 and L2, but as expected the *context dependent task* did not. More unexpectedly,

the L2 scores were significantly higher than the L1 scores. Finally, in regards to the relationships between the creativity instruments and the metaphor tasks, a number of significant correlations were found. The Japanese version of the Context Dependent Metaphor task showed the most consistent correlations with the creativity instruments. The results also indicated that these metaphor tasks outperformed the creative products used in this main study, in terms of correlations with past creative achievements and the creative personality. In this next section, I discuss and consider these findings in more detail.

### 7.3 DISCUSSION

Section 7.2 described the statistical tests that were conducted to investigate the hypotheses made in this thesis. The results of this study provided important insight into both the multifaceted nature of creativity and the process of creative metaphor production across two languages. In the first part of this section, I aim to interpret and explore in more detail some of these findings. First, I argue that the FFM\_CPQ had the strongest predictor of real life creativity and possibly reflects the higher order factor called plasticity, which is associated with human growth and expansion (DeYoung, 2006). Secondly, I address the creative products used in this main study (the poem and two drawings) and issues that arose from using such instruments to measure the creative process and suggest that the creative metaphor production tasks are a more valid approach.

Then in the second part of this section, I consider some of the findings in regards to the metaphors tasks. First, I consider one surprising finding in this thesis, specifically the fact that participants scored higher on the one of the creative metaphor tasks in the L2 than the L1 and explore possible interpretations to this. Then I consider the individual difference, the need for novelty, as one possible way to explain the differences in the creativity scores between individuals in these metaphor tasks. I theoretically base this difference on one's disposition towards fine and coarse semantic processing (Beeman, 1998; Jung-Beeman, 2005) when confronted with a metaphor production prompt. Finally in the last section of this chapter, I examine some emergent themes that had not been anticipated or considered prior or during the research, but surfaced while looking more carefully at the results.

### 7.3.1 DISCUSSION: THE CREATIVITY INSTRUMENTS

#### 7.3.1.1 The Five-Factor Model of the Creative Personality and Measuring Plasticity, a Higher Order Personality Factor

One goal of this research was to explore different creativity instruments and seek out relationships between them in order to understand and identify certain aspects of the complex nature of creativity as a psychological construct. Specifically, I tested the predictive power of various independent variables such as creative personality scales, creative products, and self-belief scales had on individuals' past creative achievements. The personality scale developed for this study, called the Five-Factor Model of the Creative Personality Questionnaire (FFM\_CPQ), showed to have the strongest predictive power.

The FFM\_CQP is mainly comprised of items related to Openness to Experience, but it also contains a number of items from the Extraversion factor (see Chapter 5 for the full list of items in this questionnaire). This corresponds to recent work that has looked at higher order factors of the Big Five (Digman, 1997; DeYoung, 2006). These two higher order factors are labeled Stability (Conscientiousness, Agreeableness, and Emotional Stability), which is associated with socialization processes and Plasticity (Openness and Extraversion), which is associated with personal growth (DeYoung, 2006). DeYoung (2006) elaborates on this description of Plasticity, as having the tendency “to explore and engage flexibly with novelty, in both behavior and cognition” (p. 1138). In short, this questionnaire appeared to measure this tendency to explore novelty and seek out new ways to cognitively expand and grow. Therefore it more broadly reflects the creative personality than looking singularly at Openness to Experience.

There were a couple reasons why I developed this questionnaire. First, I wanted to construct a questionnaire that reflected local students’ perspectives of the creative personality. Secondly, from the pilot study, I needed a questionnaire that was more streamlined and abridged since the participants had to complete a number of tasks in this study. There have been attempts to develop a shorter 10-item version for the five-factor personality items (2 items for each factor) (see Gosling, Rentfrow, & Swann, 2003; and Oshio, Abe, & Cutrone, 2012 for a Japanese version), but these brief measures broadly cover all of the factors and my goal was to focus more on the items that aim to measure the creative personality.

In contrast to this FFM\_CPQ, the creative products showed limited associations with the other creativity instruments. In the next section, I consider some possible reasons for this and discuss how the creative metaphor tasks used in this study are a more reliable way to measure the creative process.

#### 7.3.1.2 Creative Generation: From Writing Haikus to Producing Metaphors

As mentioned in the previous section, the verbal and figural creative products correlated with each other, which suggests that this might be indicative of an artistic dimension of creativity. Although in contrast to other studies, which have found associations between a creative production task and the personality trait, Openness to Experience, (Chamorro-Premuzic & Reichenbacher, 2008; McCrae, 1987; Silvia et al., 2008, 2009), this study did not find any such associations between these creative products and the FFM\_CPQ. Besides, the before mentioned differences between the FFM\_CPQ and an instrument that specifically measures Openness as a discrete factor, these previous studies often relied on divergent thinking tasks (e.g., “generate unusual uses for a brick”) for the creative production task and this study used a verbal and figural creative product. Despite this lack of associations with the other creative instruments, namely the personality items, the drawing score did show a significant correlation with past creative achievements.

Therefore what these results suggest is that these scores for the creative products (a short poem and 2 sets of drawings) could likely be measuring artistic creativity or one narrow facet of this multidimensional construct. One problem of using creative product generation tasks is that they often overly rely on having artistic skills like drawing or writing and overlook everyday creativity or creativity in other domains like the sciences

or music. Other issues that arise in using creative production tasks like the ones in this study are the time constraints and pressure to produce a creative product like a poem “on the fly” or in “real time”. Conversely the creative metaphor production tasks in this study showed strong associations with a number of the creative instruments and the JCDMS also significantly correlated with the FFM\_CPQ. Consequently, this study has provided some evidence for the plausibility that creative metaphor production is a valid and distinct instrument to measure the creative process. These creative metaphor tasks provided some insight into how the mind violates norms and disrupts expectations by conceptually combining distantly related concepts together in novel ways. On account of this, the remaining part of this chapter explores in more detail the results of the metaphor tasks.

### 7.3.2 DISCUSSION: THE CREATIVE METAPHOR PRODUCTION TASKS

A key theme that runs through this thesis is the idea of metaphor existing along a cline or continuum from the highly conventional to highly creative. The highly conventional ones are salient and familiar expressions that are common and widespread in language. In contrast, novel and creative metaphors are not typical in everyday language and thus are rather rare when doing corpus-based studies on metaphor (Deignan, 2005). Yet in this study, creative metaphors were intentional and thereby deliberately crafted by the participants for the purpose of completing the tasks in this research. Creativity refers to the “ability to come up with ideas or artifacts that are new, surprising, and valuable” (Boden, 2004, p.1). Creative and novel metaphors defamiliarize and add interpretive work that requires one to “deconstruct or ‘unpack’” it in order to find the meaning within it (Knowles & Moon, 2006, p. 5). Defamiliarization is achieved through “the novelty of

an unusual linguistic variation” (Miall & Kuiken, 1994 p. 391). In short, creative metaphors surprise the reader by their unusualness and originality, but at the same time, they are crafted to be socially accepted, as language that is meaningful and appropriate.

7.3.2.1 Creative Metaphor Production in an L1 and L2: Entrenchment and Exploration

In this thesis, I hypothesized that this ability to generate creative metaphors is likely an individual difference. In this case, if one produced creative metaphors in an L1, one was also likely to produce them in an L2. This did appear in the data, as both L1 scores and L2 scores showed positive significant correlations. Therefore *creative metaphoric competence*, as assessed in this study, is a competency at the conceptual and personality level, which then appears in language, no matter if this is an L1 or L2. So this competency is not transferred from an L1 to an L2, but rather is projected onto both an L1 and L2 when confronted with a creative task. To illustrate this at the individual level, responses from participant 81 (see Table 7.14), are used to highlight creativity avoidance (i.e., having a low level of *creative metaphoric competence*). In each production task, this individual provided highly literal and straightforward responses both in Japanese and English (despite being instructed to respond as creatively as possible).

TABLE 7.14: PARTICIPANT 81 RESPONSES TO THE CONTEXT METAPHOR TASKS IN THE L1 AND L2

English	Japanese
1. In writing class, Mary has been told to look into her past and ( <b>explain</b> ) some of her memories for there is a lot of good drama there.	1. A friend asked her to give a speech at his/her wedding reception, ( <b>she expressed the content of the speech with her body</b> ).
2. After graduating from university, he has not been able to find a job. But still he bought a new car and a lot of new clothes. Now he has a lot of credit card debt and worries. He ( <b>is fool</b> ).	2. His parents had many expectations that their son would be successful, so they got him into an expensive private university. But rather than studying hard, he began to party every night and in the end he had to drop out of school. His parents dream ( <b>was different than the son’s dream</b> ).
3. Yesterday in Odaiba, AKB48 came to sign autographs for their fans. There were so	3. It was really exciting for I was competing against the top-level skaters in the world in

<p>many people waiting outside and when they finally opened up the gate to let the fans approach the tables, <b>(fans run to AKB48)</b>.</p> <p>4. I met this really great girl or boy last night. We went out and had a great time. When I got home I couldn't sleep. She or he really <b>(is very cute/handsome)</b>.</p>	<p>the Olympics. So I will never forget this experience. This experience <b>(showed my competitive spirit)</b>.</p> <p>4. When I passed the university entrance exam, my parents <b>(pinched my cheek)</b>.</p>
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\* In the parenthesis above are the participant's responses to selected items from the context dependent metaphor tasks.

In contrast, participant 123 showed the opposite or a disposition towards producing novel and creative responses (i.e., having a high level of *creative metaphoric competence*). To accomplish this, this individual used imagery and extended conventional metaphors, as seen below in Table 7.15.

TABLE 7.15: PARTICIPANT 123 RESPONSES TO THE CONTEXT METAPHOR TASKS IN THE L1 AND L2

English	Japanese
<p>1. In writing class, Mary has been told to look into her past and <b>(opened a book of her story)</b> some of her memories for there is a lot of good drama there.</p> <p>2. After graduating from university, he has not been able to find a job. But still he bought a new car and a lot of new clothes. Now he has a lot of credit card debt and worries. He <b>(is now standing on the edge of hell)</b>.</p> <p>3. Yesterday in Odaiba, AKB48 came to sign autographs for their fans. There were so many people waiting outside and when they finally opened up the gate to let the fans approach the tables, <b>(fans flowed there in like a muddy stream)</b>.</p> <p>4. I met this really great girl or boy last night. We went out and had a great time. When I got home I couldn't sleep. She or he really <b>(was a national treasure)</b>.</p>	<p>1. She has a beautiful voice. Whenever I hear her voice, I imagine <b>(walking along a clear lake deep in the forest with a heavy morning mist rising)</b>.</p> <p>2. His parents had many expectations that their son would be successful, so they got him into an expensive private university. But rather than studying hard, he began to party every night and in the end he had to drop out of school. His parents dream <b>(was tossed into a trash bin like torn up pieces of tissue paper)</b>.</p> <p>3. It was really exciting for I was competing against the top-level skaters in the world in the Olympics. So I will never forget this experience. This experience <b>(has lit a bonfire in my heart)</b>.</p>

Such examples above show that some individuals (as in participant 123) have a tendency or a disposition towards novelty while others (as in participant 81) have an avoidance of novelty. This convergence of producing creative metaphors in both languages suggests

that it is a stable individual difference. This difference is likely both a personality trait, which involves risk taking, openness, and novelty seeking, as well as a cognitive trait, which involves the combinatorial ability of combining distantly related concepts together in new and meaningful ways.

Future studies could usefully conduct an in-depth analysis that compares the response strategies of the participants across the two languages. For instance, in the Japanese data, we have an image metaphor (a “beautiful voice” represented as “walking along a clear lake”), an ontological metaphor (an abstract entity, a “dream” is represented as something concrete “torn up pieces of tissue paper”), and a conceptual metaphor (a passionate experience is represented with heat, i.e., “passion is heat”). It is beyond the scope of this thesis to examine these responses in such detail, but from the data, it appears that the participants used a wide range of strategies to creatively complete these tasks ranging from imagery to conceptual metaphors and to more novel instantiations of metaphors.

Despite the fact that the data showed a strong correlation between the responses in both L1 and L2, as previously indicated, it was also hypothesized that differences in scores between the two languages would not be significant. The results for the context independent metaphor task proved otherwise.

The discrepancy in the creative metaphor production scores between the participants’ L1 and L2, which favored the L2, may be surprising at first glance, but at the same time has the potential to be interpreted from a number of different perspectives. Firstly, it can be assumed that in the participants’ L1, conventional metaphors, which are

those “that are most alive and most deeply entrenched, efficient, and powerful” (Lakoff & Turner, 1989, p. 129), are more highly salient for the participants, or as Giora (2003) describes as being more likely “on our minds” and thus influential in the responses on the creative metaphor production tasks. In this perspective, these conventional metaphors, which have become conventionalized and entrenched in the individuals’ minds is predominantly an effect of usage (Svanlund, 2007).

To elaborate on this explanation, these differences in scores could be related to the tendency that people resort to, when faced with a generative task such as those in this thesis that required participants to produce a creative metaphor, the “path of least resistance strategy” or the least cognitively demanding route (Ward, Patterson, Sifonis, Dodds, & Saunders, 2002). For instance, the L1 task is less cognitively demanding for it is easier to make or simply recall metaphorical associations between concepts due to these concepts having greater associative strength between them. In contrast, in the L2, metaphorical associations are likely not as robust or entrenched within the L2 mental lexicon and therefore require the individual to seek out possible relations with new concepts, which in the end are viewed as being more original and creative. Shamy-Tsoory and colleagues (2011) discuss characteristics of an original response, which is the ability to produce a new and infrequent response that still within the context is appropriate. This process of coming up with an original response requires the interaction of (1) generating new and unique ideas while at the same time (2) inhibiting stereotypical automatic thinking patterns. Again this inhibiting stereotypical or conventional metaphorical responses is likely more difficult to do in the L1 since these

associations are more entrenched and automatic in the thinking process (see Figure 7.3 for a representation of this process).

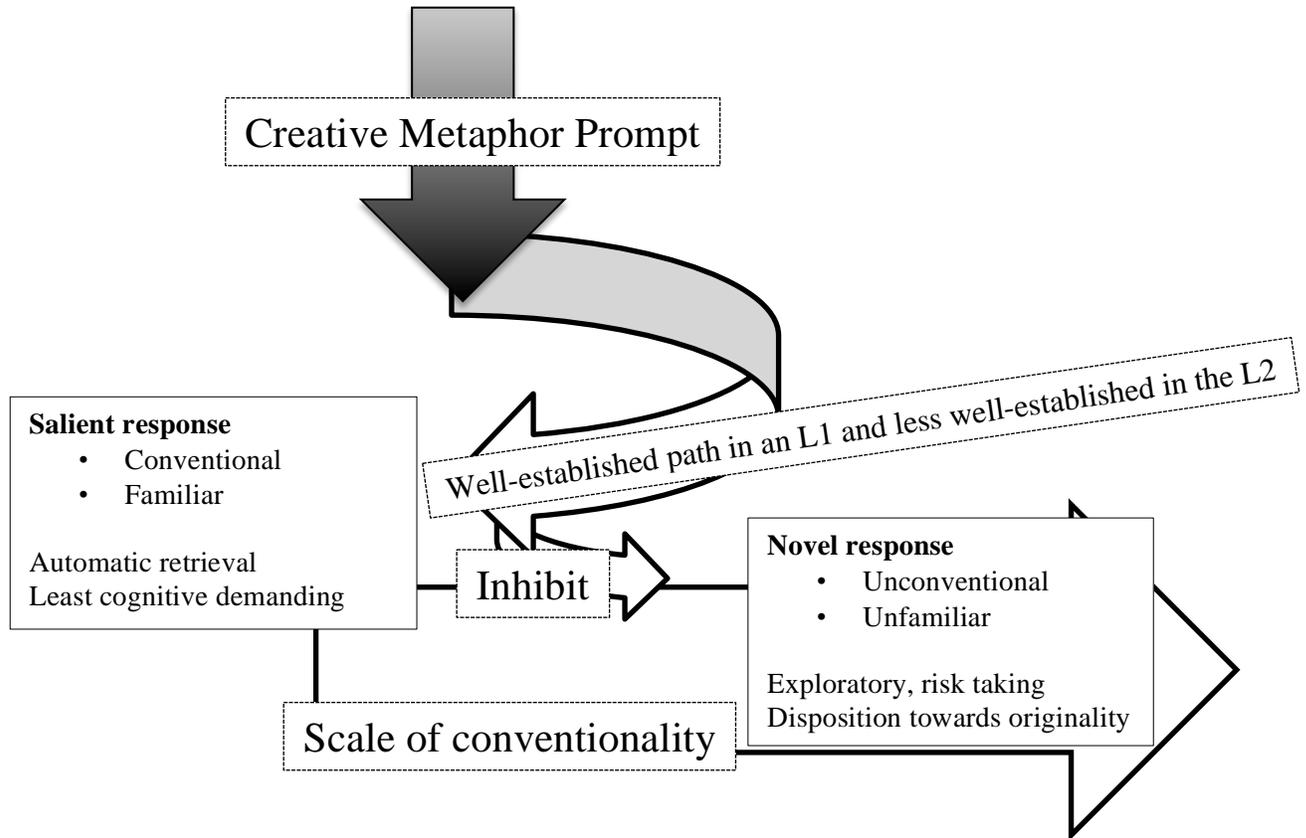


Figure 7.3: A representation of the creative metaphor prompt and subsequent automatic retrieval and inhibitory process to seek out a novel response

#### Another Possible Interpretation and Limitation of this Study

A completely different approach to interpreting the difference in scores between the two languages is to consider the problems of assessing creativity in an L2. For instance in this study, I used native speakers of English to assess the participants' L2 scores for creativity and there is the possibility that the evaluators assessed a creative metaphor as a novel innovation, for it was different, new, unfamiliar, but in fact it was a linguistic error or deficiency (see Kachru, 1985). Another methodological issue of assessment is the

possibility that the participants simply transferred a conventional metaphor from their L1 directly onto the L2 and then the evaluator viewed it as creative, new and original since such a conventional expression possibly does not exist in the L2 (or in this case English). This is a limitation of this study and future studies need to consider the importance of using bilingual evaluators who have conceptual and linguistic knowledge of both systems to code the metaphors for creativity and to be aware of possible transfer of conventional L1 metaphors onto the L2.

In the next section, I focus my attention not on how I found differences between the cumulative creative scores between the L1 and L2, as outlined above, but on how I also found significant correlations between all four sets of these creative metaphor tasks. This suggests that this ability to generate a creative response to a metaphor prompt is an individual difference, yet what this actually means is still rather unclear. Therefore in the next section, I explore this individual difference by looking more closely at the participants' responses and attempting to illustrate the different cognitive processes in producing a novel, as compared to a conventional response. I conclude by pointing out that this difference may be the result of one's disposition towards novelty.

#### 7.3.2.2 An Individual Difference: The Need for Novelty

In Chapter 3, I discussed Jung-Beeman's (2005) *coarse semantic coding theory*. In this theory, he suggests that when one is confronted with (novel) figurative language, the right hemisphere may be recruited in order to activate larger diffuse semantic fields. This enables one to find meaning in the language and consequently successfully process it.

The sensitivity of the brain to novel figurative language has been demonstrated in a

number of studies (Mashal et al., 2005; Mashal et al., 2007; Pobric et al., 2008; Schmidt et al., 2007)<sup>16</sup>. This novelty, often in the form of combining distant semantic concepts together in unfamiliar ways, gives an “unfamiliar air” to the language and is one of the innovative aspects of everyday creativity.

Jung-Beeman’s approach, which examines bilateral brain processes for comprehending natural language, focuses more on the process of comprehension and less on the process of producing creative metaphors. In contrast, this study relied on creative metaphor production tasks. To return to some examples used in this study, one task prompted the participants with a topic concept (“Life is \_\_\_\_”. e.g., Life) and then they had to complete the metaphor in a creative way and provide an interpretation of it. Another task primed the participants to think of a metaphor topic that was embedded within the context of a sentence and asked them to creatively complete the sentence with a metaphor (“In writing class, Mary has been told to look into her past and \_\_\_\_\_ some of her memories for there is a lot of good drama there.” e.g., the act of recalling past memories). Participants’ responses to these prompts could be indicative of differing semantic processes used to complete the metaphor, as in *fine* and *coarse* semantic processing. The latter involves the search for more distant and diffuse semantic relations for the prompt and the former concentrates more deeply within a singular semantic field

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<sup>16</sup> This is still a controversial topic, but to reiterate my stance, I am not saying the right hemisphere is necessary for metaphor comprehension, but rather only for novel metaphor comprehension and production. As stated in the conclusion of a recent quantitative meta-analysis of neuroimaging studies that addressed this issue, “Neither the overall contrast nor the subgroup analysis on metaphors revealed any general RH advantage for figurative language processing. However, many recent publications no longer propose a general strong RH dominance but claim that the RH is involved in processing mainly novel, unconventional conceptual combinations, such as novel metaphors. The results from the novel/conventional contrast confirm to this and are also in line with the GSH: only novel, but not conventional metaphors report robust RH activation in the RIFG and right ACC” (Bohn, Altmann, & Jacobs, 2012, p. 2681). (RH – right hemisphere; GSH – Graded Saliency Hypothesis; RIFG – right inferior frontal gyrus; ACC - anterior cingulate cortex)

of related word associations. That is, using this coarse semantic processing provides the cognitive mechanism with an opportunity to “stretch” from the literal or expected (Katz, 2006) in order to intentionally generate a creative metaphor. This ability is shared in all normally developed humans, but like other individual differences, it is more prominent in some or otherwise some are more inclined towards it, consequently, responses to these prompts ranged from the highly expected to the highly unexpected.

#### Examples from the Study: Fine and Coarse Semantic Processing

From the results of this study, as stated above, it appears that some individuals were more prone to *fine* semantic production or providing a response that is closely related to the target concept. These types of responses were highly salient and required the least amount of cognitive effort. For instance, some responded to the prompt that asked them to complete the sentence describing a beautiful voice with a concept that is part of a music frame, such as a famous singer or a musical instrument. On the other hand, some individuals were more open to *coarse* semantic production than others. This required inhibiting salient responses, as well as, being sensitive to and seeking out distant semantic relations. Moreover in many cases, it required one to shift outside the frame, in this case music, to a distant frame and that despite its distance some relational structure between the two concepts can be discerned. One example, from the previously mentioned metaphor task (e.g., describing a beautiful voice), was “the dripping of ice above a hot spring”, which conjures a nature frame with the soft, natural, and rhythmic sound of water dripping into a warm pool. This response was rated high by all of the evaluators. This nonobvious and unconventional response is innovative and overcomes the habitual way of viewing a beautiful voice outside the music frame. It is what is “out of our minds”

or not salient that makes it creative, novel, and new, yet it also conjures the familiar, as in the beautiful sounds or what some may describe as music produced in this kind of natural setting. See figure 7.4 for an illustration of this process.

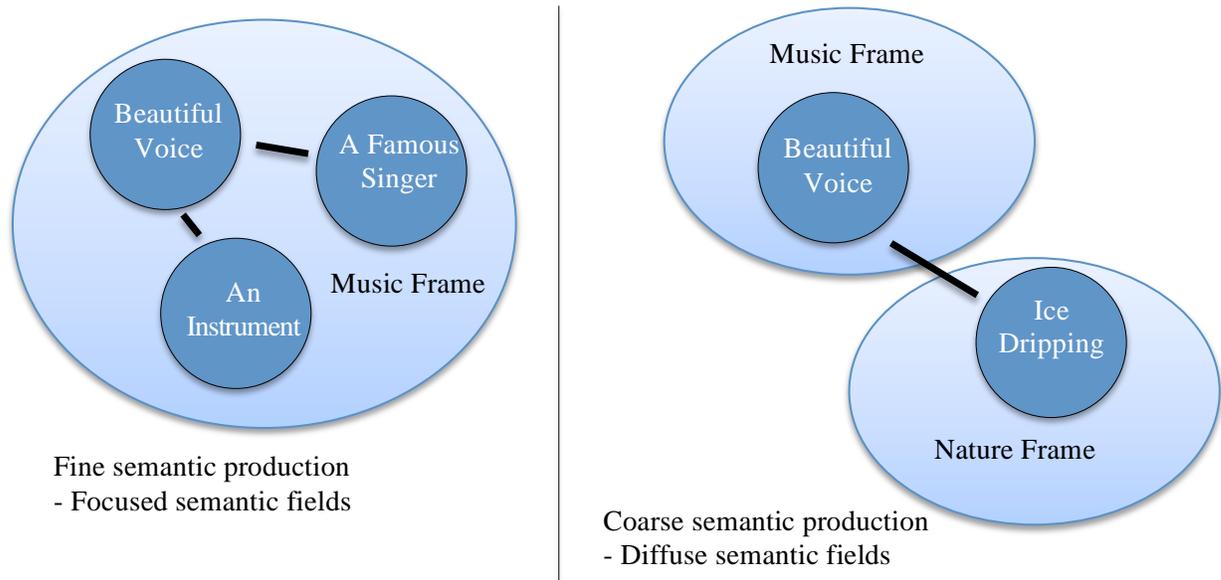


Figure 7.4: Illustration of fine and coarse semantic production for the “Beautiful Voice” prompt in the context dependent metaphor task

### Examples from the Study: From Conventionality to Conceptual Reorganization

A scale of metaphoricity is often used to describe stages or states the metaphor is in from dead, to inactive, to active and fresh (Goatly, 2011). In the context independent metaphor tasks in this research, which asked the participants to creatively produce a metaphor using a copula, these metaphors also fell on a continuum or scale of conventionality towards an increasing degree of creativity. The further along this scale, the more “risky” the metaphor becomes since it is closer to anomalies and a possible break down in the addressee being able to comprehend the meaning of it (Nair, Carter, & Toolan, 1988). The more distant the two concepts are, the higher degree of conceptual reorganization or radical innovation it takes to produce and process (see Traugott, 1985, p. 23). Figure 7.5

uses examples from the prompt, “Life is \_\_\_” to illustrate this. Salient or familiar and conventional responses used some variation of the “journey” frame. This is evident from the wide number of responses in this study that provided some “journey” as the response or some variant of it like “road”, “rocky road” or “boat journey”. Yet in all of these, it is rather straightforward to recognize the conventionality of the responses. These responses are processed quite effortlessly and in turn the evaluators gave them low scores for creativity. On the other hand, responses that require conceptual reorganization forces one to reconsider how we normally view a concept such as an “electrocardiogram”. Such metaphors require more cognitive effort in order to seek out meaning in it. A metaphor like “Life is an electrocardiogram” is rather novel, but there are familiar features that it has that similarly map to our understanding of life such as the up and down nature of it and how life oscillates back and forth, but it also has the more obvious referent in that this machine actually does represent life, or the beating of the heart.

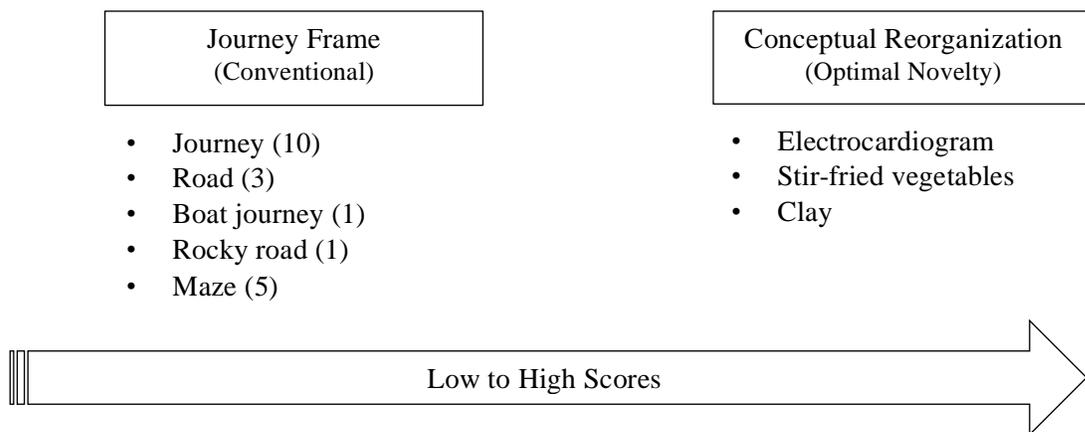


Figure 7.5: An outline of conventionality and conceptual reorganization in responses from the “Life is \_\_\_\_\_” metaphor prompt (the number in parenthesis is the total for that response)

The second response, “stir-fried vegetables” (as shown in the above figure) again takes more effort and is less obvious, but it is an apt metaphor for the participant

explained it in this way, “stir-fried vegetables, basically are not decided for you, but you have to choose the ones to cook with and also the spices you use. Everyone also cuts up the vegetables differently. So if ten people made stir-fried vegetables, you are likely to get ten different kinds of vegetables. This is the same as life” (participant 22). So this metaphor highlights the diversity of life and the uniqueness of each individual.

In Chapter 3, I presented Bowdle and Gentner’s (2005) career of metaphor model and the differences in these responses above reflect different cognitive processes, based on how conventionalized the metaphor is. They point out that metaphors proceed along a path of conventionalization, as they become more familiar, common, and widely used. That is to say, as the associations between the two concepts (e.g., LIFE; JOURNEY) become stronger, it shifts from comparative to categorical processing. Categorical processing is more rapid, effortless and less cognitively costly, as the abstraction of the metaphor becomes lexicalized. In this view, the topic (e.g., LIFE) is included in the category of the vehicle or source (e.g., JOURNEY) and inherits relevant features of this category (e.g., movement, beginning and end, requires exertion, etc.). The process of comparison for novel metaphors, or those that are less familiar and well-known, are more similar to analogies and require more effort. Here the properties of the vehicle or source (e.g., STIR-FRIED VEGETABLES) are aligned and then mapped onto the topic (e.g., LIFE). Here the relevant features do not accentuate the “movement” often associated with metaphors that describe life, but the choice each individual has in determining his/her life and the diversity of life in general.

Past research has typically focused more on the processing of metaphors and differences between conventional and novel ones. In these studies, in order to understand the language prompt, one is required to use different processes (i.e., categorization or comparison). In this study, I did not focus on the processing of metaphor, but rather looked at metaphor production by the participants. Differences in their responses were clearly evident and these observable differences were based on conventionality and novelty. In these metaphor production tasks, each participant had to rely on one's own disposition or tendency to produce a metaphor and some showed signs of a greater disposition towards producing novel ones regardless of the language.

#### Examples from the Study: From Conventionality to Conceptual Reorganization 2

The previous example focused on responses from the context independent metaphor task. In this part, I focus on the context dependent metaphor task and provide a similar illustration of how responses moved along a continuum from the highly conventional and automatic to the unconventional and creative. In prompt number 3 in the Japanese version, the context of the sentence was as follows:

- His parents had many expectations that their son would be successful, so they got him into an expensive private university. But rather than studying hard, he began to party every night and in the end he had to drop out of school. His parents dream \_\_\_\_\_.

The above sentence prompts the participants to come up with a way to express the disappointment of the parents dream. As such, the most common responses had to deal with this dream being “crushed”, “smashed”, “vanished” or “torn apart”, all

metaphorical, but highly conventional and prototypical responses for conveying disappointment.

A number of other participants extended this conventional metaphor by inhibiting this common response and used exemplars of things that vanish or break easily. What could be happening here is when the participant is confronted with this prompt, this gives rise to an ad hoc category (see Barsalou, 1983; Casasanto & Lupyan, 2015) such as “things that vanish” or “things that break easily” or “things discarded without care”. The following are some examples from the responses to this prompt that appear to fit into such ad hoc categories; “a sand castle”, “dust in the wind” or “expensive wine glasses”.

Finally some participants responded in novel, but also appropriate ways. In one example, the participant used beautiful imagery that describes decay, but more importantly the disregard for these dreams, as something easily discarded, “The parents dream was trampled on like dead leaves on the side of the road”. Figure 7.6 illustrates the movement from the highly familiar responses towards those that are more unexpected, unconventional and novel responses. Although the last 2 types are clearly divided in this illustration, in reality, there are less clear-cut borders between them and they should be viewed as gradations of creativity. That is to say, three independent evaluators have judged the unconventional ones as being more creative and this could be based on the responses using one of the following techniques:

- Vivid imagery in the response
- Unusualness or surprisingness of the response

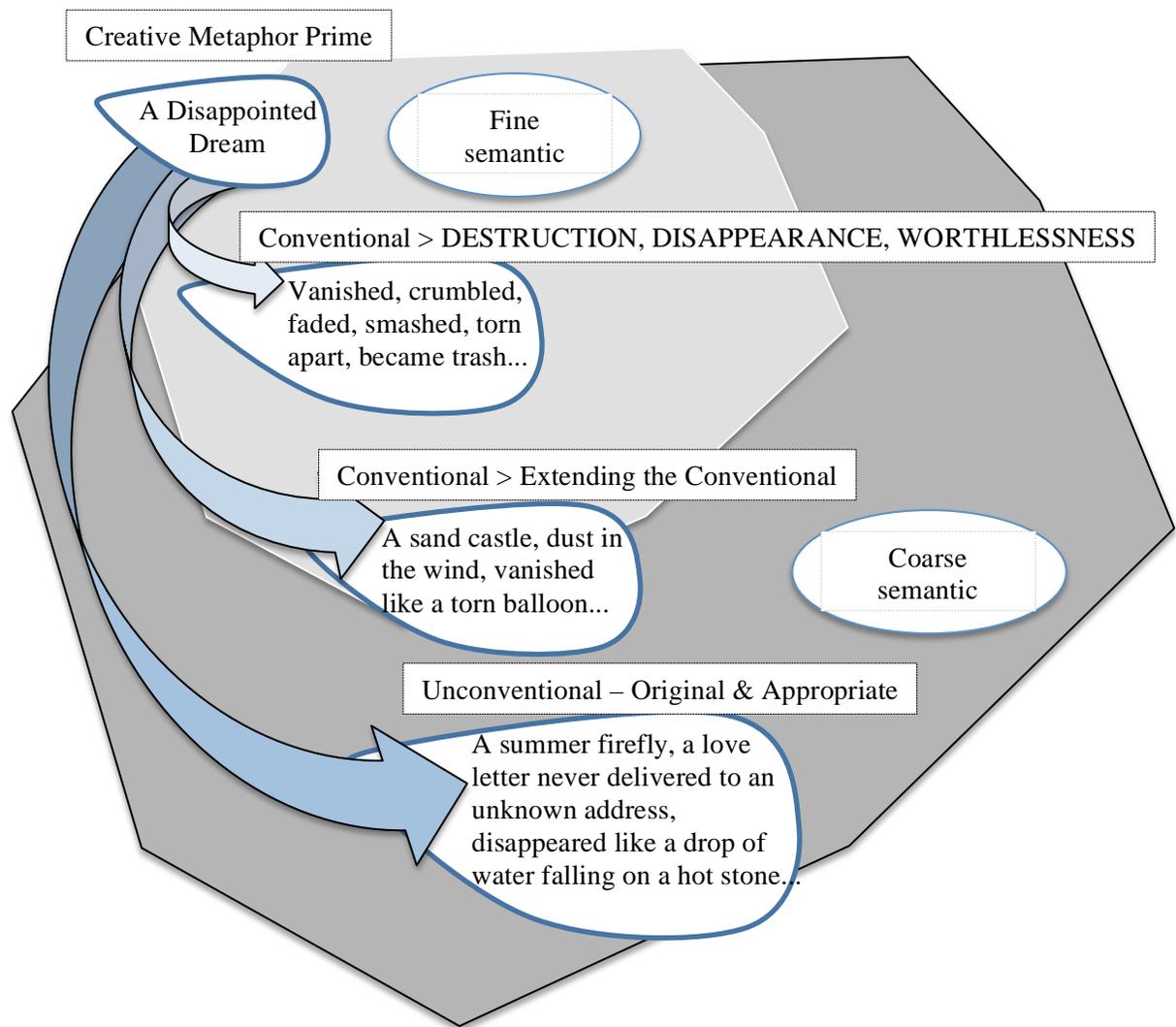


Figure 7.6: Illustration of the continuum from the conventional to the unconventional from the “Disappointed Dream” prompt in the context dependent metaphor task

### Creative Metaphor Production and a Need for Novelty

In this section, I have outlined the differences between the conventional and creative responses to these sets of metaphor tasks. If the salient response is automatic and least cognitively demanding, what might trigger one to inhibit this response and seek out less conventional and novel responses to a metaphor prompt when the participants well knew that this study was anonymous and had no immediate effect on his/her academic affairs or life in general? One possibility is an individual difference or a dispositional tendency

that is important for creativity and has been called a number of different, but similar labels such as “need for uniqueness” (Dollinger, 2003), “novelty seeking” (Bevins, 2001; Wentworth & Witryol, 2003), and “need for novelty” (Houston & Mednick, 1963; González-Cutre et al., 2016). These all point out the importance of novelty for creativity and exploratory and risk taking behaviors. Earlier studies showed that the need for uniqueness is associated with a number of creativity related concepts like innovativeness (Skinner, 1996) and divergent thinking within a Japanese context (Okamoto & Takaki, 1992). Moreover Dollinger (2003) draws attention to the notion that in fact it may be more accurate to say that it is the unique-avoidant individuals who are more prone to provide the common, expected, and conventional response. This need for uniqueness is an individual difference and likely is related to a motivational process that produces creative outcomes (Okamoto & Takaki, 1992).

In a recent study, using the term a “need for novelty”, González-Cutre and colleagues (2016), have suggested that this “need” is crucial for motivation. In fact, they have even proposed that this “need for novelty” be included into the basic psychological needs as outlined in Self-Determination Theory (Deci & Ryan, 2000). In short, this need for novelty is an individual difference that likely motivates an individual to use coarse semantic processing in order to seek out unusual, new, and surprising responses to a prompt. This individual difference, as measured by the creative metaphors scores, does appear between the L1 and L2, which suggests that it is a disposition or tendency one has to explore unique and novel possibilities. Since creativity is closely related to novelty, this “need for novelty” contributes crucially to one’s ability to produce creative responses

for it acts as a motivator to seek out and explore possible new and unusual ones rather than rely on the conventional and least cognitively demanding responses.

### 7.3.3 DISCUSSION: EMERGENT THEMES

The last two topics discussed in this chapter emerged unexpectedly while looking at the responses in more depth and I believe they provide some additional insight for this study and therefore they are included here. First I address the evaluative process of creative metaphors and how the evaluators scored higher metaphors that used an embodied concept for the source or one that is experienced through the sensory-motor systems (e.g., rain, as compared with liberty). Secondly I consider the differences in emotional valence of these metaphor responses, whereby, those rated more creative, also appeared to have more emotionality and this could include both negative and positive value.

#### Creative Metaphors: The Importance of an Embodied Source for Creativity

In general, for nominal metaphors (e.g., A is B), the topic is more abstract and the vehicle is more concrete or embodied. For instance, the novel metaphor mentioned in Chapter 2 “the therapy was an archeological dig”, an archeological dig (the vehicle or source) is highly experiential and involves working with one’s hands likely at some historical site and sifting through artifacts and dirt. In contrast, therapy (the topic) is more abstract and involves dialogues and exploring the patient’s mind, memories, and fears. So this metaphor is novel and original, but also appropriate. It is appropriate because there are sufficient features that can be mapped from the source onto the topic allowing one to construe the concept of “therapy” in a new way. On the other hand, “therapy is a dream”, may seem original to the reader (one has probably never heard this before!), but since the

source uses an abstract concept (e.g., “dream”), it may not be viewed as being very appropriate as a metaphor and therefore is likely viewed as not being highly creative. Moreover, what features of dream could map onto therapy, which might provide some insight into this concept (besides the polysemous meaning of the word, “wonderful or perfect”)? Nonetheless this assumption that nominal metaphors are viewed as being more creative when using a concrete source domain is highly intuitive and not based on any empirical data, as far as I know.

In this study, I used three independent raters to assess the context independent metaphors and they scored the metaphors that had used an embodied or more concrete concept for the source (e.g., mountains), as compared to those that had used an abstract concept (e.g., eternity), as being more creative. Categorizing the participants’ responses to the two English prompts for this metaphor production task, I categorized them as either abstract or concrete and then conducted an independent samples t-test to compare the mean scores between these two category types. There was a significant difference in the scores for abstract responses ( $n=58$ ,  $M=1.36$ ,  $SD=0.34$ ) and concrete responses ( $n=191$ ,  $M=2.15$ ,  $SD=0.52$ ) conditions;  $t(247)=-10.96$ ,  $p<0.00$ . The concrete responses had a slightly larger standard deviation due to these responses as either being rated lower due to its conventionality or higher due to its novelty, but these scores were significantly higher than the responses that used an abstract concept. Figure 7.7 shows this continuum of participants’ responses from the abstract to the concrete (conventional) to the concrete (original). Similarly the raters rated these responses on the same cline from low to medium to high scores for creativity.

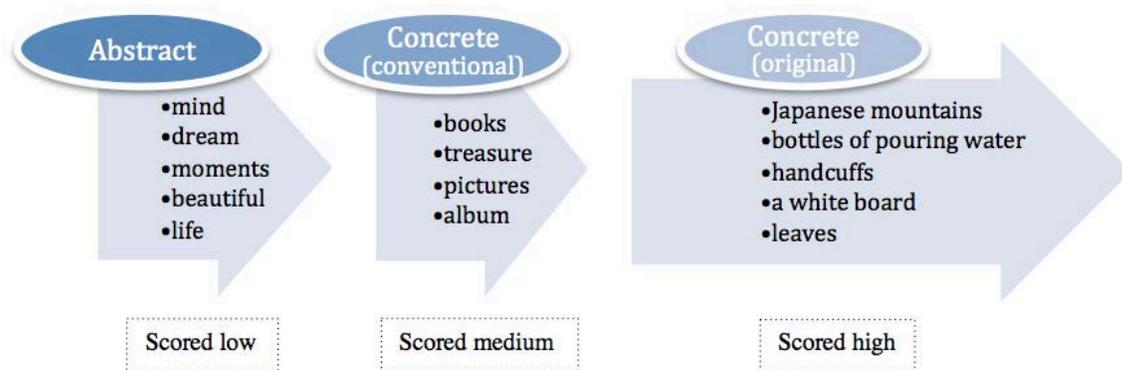


Figure 7.7: Examples from the participants' responses to the "Memories are \_\_\_\_" prompt, as illustrated on a continuum from the abstract to the concrete.

In summary, this suggests that regardless of the originality of the source concept used to complete the metaphor tasks, concrete concepts were viewed as more creative than abstract ones. This is likely due to the fact that concrete concepts have greater imageability and context availability (see Chapter 2.21 on Paivio's dual-coding theory and Schwanenflugel's context availability theories) and therefore they have more structure and possible features to map onto the topic. In addition to this concrete source priority for creativity in the metaphor responses, another emergent theme from this study had to do with emotionality of the creative responses, which is discussed in the next subsection.

### Creative Metaphors: Do They Evoke a Greater Emotional Response?

It has been long thought that metaphor and the emotions are closely related (see Kövecses, 2003). While further examining the responses to the Context Dependent Metaphor Task, which required the participants to complete a sentence that primed them to produce a metaphor and was then scored on a 4-point scale for creativity, the responses that were evaluated as being highly creative also often had a stronger emotional valence,

either having positive or negative value. To further illustrate this, below are two responses taken from JCDM Task #3 (priming the participants to produce a metaphor to describe a disappointed dream), the prompt to this task has already been described in more detail in a previous section. For instance, in the following two responses, though both were scored as creative responses, they vary greatly in the character of emotion they evoke.

- His parents dream was sucked into a black hole (両親の夢はブラックホールに吸い込まれた ryoshin no yume ha burakuhoru ni suikomareta) (subject 86)
- His parents dream was like looking for a pearl in mountain of snow (両親の夢は雪山から真珠を見つけ出すようなものだ ryoshin no yume ha yukiyama kara shinju wo mitsukedasu youna mono da) (subject 51)

The first one is bleak and irredeemable. It conjures up a negative emotion, as this disappointed dream has become utterly hopeless for it has been sucked up into the expansive darkness of a black hole. In contrast, the second one still offers hope. The dream is actually mapped onto a pearl, which is a positive image, and despite being buried among the snow, so it is hidden from sight; it still evokes the feeling that it might be discovered again.

To further illustrate the relationship between creativity and emotion, below are some responses taken from the ECDM Task #2, which has the following prompt.

After graduating from university, he has not been able to find a job. But still he bought a new car and a lot of new clothes. Now he has a lot of credit card debt and worries. He (\_\_\_\_\_).

This context aimed to prime the participants to consider debt, or the state of being in debt. This obviously has negative valence attached to the context of the sentence and likely primes the conceptual metaphor DEBT IS A WEIGHT (BURDEN) or BEING IN DEBT IS SINKING / STUCK. This conceptual structure appeared in a number of responses as seen below. The first response below also used the concept of hierarchies in society and the lowest are those without money or in debt. The next two responses used the idea of movement forward is a positive thing and being unable to do this or being “stuck” is the negative result of this debt. The next two used a similar idea for this lack of movement, but instead of being stuck, one is trapped.

- He has been anchored the bottom of the society. (subject 17)
- He is a bottomless swamp. (subject 14)
- He is stuck in the mud. (subject 59)
- He fall down in big hole. (subject 15)
- He is a rat in a bag. (subject 89)

Below is a response that used this idea of weight and descending into a “big hole”, but instead used a more positively charged concept to convey this, as in a spelunker, or one who explores caves. This one can be construed more positively. For instance, yes he is in debt or has sunk into these deep crevices, but he is also enjoying himself and having fun and the possibility of coming up from these dark regions is rather high.

- He is a spelunker. (subject 20)

On the other hand, the response below conveys this state of downward falling or the motion of sinking in a more positive or mysterious way. He is immature and has caused himself to fall, but the mystery or the hope in this response lies in the interpretation: Does he pass through the stage of metamorphosis and emerge from the pupa or will he deteriorate on the ground? Yet, clearly there is a certain amount of hope in this response much more so, than being “in a bottomless swamp”.

- He is a fell butterfly pupa. (subject 97)

In stark contrast to this weight and sinking representation of debt, some responded with the opposite, as in floating or having a buoyant feeling above the ground. This could be interpreted as this individual is not very “well-grounded” and takes responsibilities very “lightly”. This type of person is really representative in the character of Peter Pan, as in the second response below. Peter Pan represents an individual who flies about in a free-spirited manner and never grows up or takes on the responsibilities of an adult. Again, these responses are emotionally more positive.

- He is a balloon filled with air. (subject 6)
- He was Peter Pan. (subject 21)

Lastly, the below response conveys this state of being in debt or acting in this irresponsible way as decay. This individual’s behavior is a rotten vegetable to which one can assume this refers to the fact that his behavior is substandard and contemptible. Rotten food interestingly though is over ripened or at the final stage of being, as in old age. In contrast, this man just graduated from university. Yet again this response is quite negative and evokes feelings of hopelessness.

- He is a rotten vegetable.

These are just a few examples of responses from the Japanese and English Context Dependent Metaphor Task that scored high on the creativity scale by the raters and showed to have emotional valence associated with the response. This emotion ranges from the negative to positive. This emotional valence and assessing the positive and negative valence of a generated creative metaphor is one area in this study that emerged from examining the responses in more detail and had not been anticipated or predicted beforehand.

#### 7.3.4 SUMMARY OF THE DISCUSSION

In this discussion on metaphors, I first examined possible interpretations to why responses on the L2 for the context independent metaphor tasks scored higher than the L1. One possible reason for this is that the associations between words are stronger in the L1, which leads to a higher degree of entrenchment in comparison to the L2. This is similar to the idea of functional fixedness (Duncker, 1945), or a cognitive bias that limits the person to consider other more creative responses aside from the conventional or expected response. In the main study, participants when confronted with a topic in the Context Independent Metaphor Task in the L1 more likely fixated on a very limited number of semantic associations and thus produced a very common and familiar response. Recovering these “fixed” or “entrenched” associations between the words from memory is automatic, fluent, and consequently therefore requires more effort to inhibit. In summary, in the L1, providing a conventional response is more likely because such a

response is simply more familiar and available to the participants and such associations are likely not as strong in the L2.

Secondly I traced how the metaphor responses in these tasks followed a trajectory from the conventional to the novel. I argued that differences in scores on these tasks could be attributed to an individual difference and in this case the disposition towards uniqueness or novelty. The responses that were scored high in creativity had a number of features, as compared to those that were scored low in creativity. Firstly, they often relied on using a more distant semantic domain as the source. Secondly, they involved conceptual reorganization. Thirdly, the sources used to complete the metaphor were embodied and more physical or concrete entities. Fourthly, they had a higher level of emotional valence. These all could be viewed as defining features of creativity. These key differences between the conventional and creative responses elaborated on in this discussion section on metaphor are outlined in Table 7.16.

TABLE 7.16: DIFFERENCES BETWEEN CONVENTIONAL AND NOVEL RESPONSES

<b>Conventional responses</b>	<b>Creative responses</b>
<ul style="list-style-type: none"> <li>• Salient, familiar, prototypical</li> <li>• Stay within the same frame as the target concept</li> <li>• Short, automatic responses</li> <li>• Cognitively less demanding</li> <li>• Low risk</li> <li>• Fine semantic processing</li> <li>• Use an abstract response or concrete response that is highly conventional</li> <li>• Low emotional valence</li> </ul>	<ul style="list-style-type: none"> <li>• Optimally innovative</li> <li>• Leap from one frame to a semantically distant frame</li> <li>• Vivid, unfamiliar &amp; surprising responses</li> <li>• Inhibit the stereotypical/conventional response</li> <li>• Involve conceptual reorganization</li> <li>• Risk taking</li> <li>• Coarse semantic processing</li> <li>• Emotional valence (positive or negative)</li> </ul>

## **Chapter 8 Conclusions, Implications and Recommendations for Future Research**

### **8.1 INTRODUCTION**

In this thesis, I have explored the idea that creative metaphor production is an individual difference and consequently would appear in both the L1 and L2. This individual difference has been described as the disposition towards novelty. That is to say, some individuals are more prone to seeking out unfamiliar and more distant semantic relationships between concepts. Using scores from these creative metaphor production tasks, I also analyzed the relationships between this competency and other instruments commonly used to measure the multifaceted nature of creativity. This final chapter aims to bring together and summarize the findings and consider the implications of this study for research into creativity in language and creativity research. I then conclude the chapter by pointing out some of the limitations of this study and possible avenues of future research.

### **8.2 A SUMMARY OF THE FINDINGS FROM THIS STUDY**

As stated in the introductory chapter of this thesis, this study has explored the relationship between two intersecting and diverging bodies of research, metaphor and creativity studies. One major obstacle to better integrating these two fields has to do with the problem of viewing metaphor as a unitary construct. Chapter 3 went into great depth to distinguish conventional and creative metaphors. As many in the field of cognitive linguistics started to draw attention to the varying states a metaphor could be found in,

spanning from dead and active (Goatly, 2011) to sleeping and waking (Müller, 2009), metaphor began to be viewed as having varying degrees of conventionality and creativity. In addition, a number of researchers have theorized that different cognitive processes are also involved in processing these different types of metaphors (Bowdle & Gentner, 2005; Giora, 2003). Hence, metaphor has come to be viewed as lying along a continuum from the conventional to the creative and this is heavily weighted in terms of quantity towards the conventional. That is to say, conventional metaphors are ubiquitous in language, creative metaphors to a lesser extent. In order to further consider this distinction, Pope (2005) has even described the conventional side of metaphor as a contradictory pole to creativity for “when metaphors become routine or over-familiar they dull rather than sharpen experience, and they tend to inhibit rather than enable creativity” (p. 139). Thus it is important to point out that not all metaphors are the same and many are not at all creative or may in fact inhibit creativity. Highlighting this has been one of the aims of this study in order to specifically measure the creative dimension of metaphor production.

Once I had established that metaphors vary greatly in their degree of conventionality and creativity in opposing directions, the next objective of this study was to develop a way to experimentally get participants to generate or produce creative metaphors. Chapter 5 reported the development of the various instruments used to measure *creative metaphoric competence* with the aim of minimizing the reliance on linguistic ability such as memory retrieval of conventional expression in order to complete them. These tasks were designed to be heuristic, an important characteristic of creativity, and not to be answered by rote. That is to say, these tasks did not have a straightforward response and had been sufficiently left open-ended and uncertain to allow

for a multitude of possible responses. Therefore the creativity of the varying responses could then be identified and scored. It is important to note here that when discussing and using “creativity” as a measurable value that is discernable in the collected responses from the participants, this brings about a crucial and somewhat controversial theme in this study and that is, “what exactly does one mean by creativity” since many view the term itself as something that is difficult to define. Although it may seem rather simple and rudimentary to explain this term, in reality defining it has been highly problematic to the point that some have estimated that close to 60 definitions can be found in the psychological literature (Taylor, 1988 as cited in Furnham, Batey, Anand, & Manfield, 2008). Despite its elusiveness, one characteristic that has continued to be a key element in its definition is the concept of “novelty”. From the 1953 definition by Stein, “the creative work is a *novel* work that is accepted as tenable or useful or satisfying by a group in some point in time” (p. 311 *italics are mine*) to the more contemporary and encompassing definition of it, “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, p. 90 *italics are mine*), novelty has played a major role in the conceptualization of this term.

Outside of the psychological literature, those working in the field of cognitive linguistics have also pointed out that novelty is an important characteristic of metaphorical creativity (Kövecses, 2010; Knowles & Moon, 2006). Kövecses (2010) highlighted this importance of viewing novelty and the unconventional as graded concepts “that range from completely new and unconventional [to those that are] well-worn, entrenched and completely conventional cases” (p. 664). In a special issue on

metaphorical creativity, Downing and Mujic (2013) also pointed out how a number of papers in that issue employ “a definition of metaphorical creativity as the capacity to produce phenomena which are *novel* and adaptive” (p. 134-5 *italics are mine*). Despite this generally accepted view that creativity is closely linked and dependent on novelty as a defining characteristic, Nacey (2013), in contrast, has argued that it is a “bit of a stretch” to view all language that is novel and intelligible as ‘creative’. She notes that its intelligibility is basically due to our ability to interpret anomalous language (Pollio & Burns, 1977, see Chapter 3) and not necessarily due to it being creative per se (Nacey, 2013 p. 203). For her, the best indicator of creativity is intentionality, i.e., the speaker or writer deliberately meant to be creative. In this research, the participants were all explicitly asked to respond creatively, so one has to assume that all the participants’ intentionality attempted to be creative in their responses. Despite clearly explicating to the participants in this study to be creative, as evidenced by the range of responses, many did not comply with this or likely did not have the disposition to provide a creative response to the metaphor prompts.

As previously mentioned, positioning metaphors along a continuum, it was then possible to disambiguate creative metaphors from those viewed as highly familiar, common and conventional. Distinguishing creative from conventional metaphors relies heavily on the use of consensual assessment. This process reflects the view that creativity, not only needs to be novel, as mentioned above, but also “adaptive” and “useful” within a social context, as judged by the raters. In language (as opposed to a creative product or invention), this usefulness is closely aligned to the interlocutor (in this case the rater) being able to find meaning within the metaphor and therefore finding it

appropriate. Exactly how the raters identified the creative responses has not been investigated in this study, but they likely relied on the following two-step process: Assess the novelty of the response and then the appropriateness of it. Although the individual raters also likely relied on various individual idiosyncrasies when rating the responses, nonetheless, they scored them with good inter-rater reliability, as shown in Chapter 6. Therefore this study used raters' subjective views of creativity as a way to score the creativity of the responses. Using subjective scoring methods has become a more commonly accepted method for scoring creativity instruments (see Silvia et al., 2008).

Consequently, I was able to gather a set of variables that assessed the participants' creativity on a number of metaphor tasks in both the L1 and L2. Chapter 8 analyzed the results from these creativity scores and the results showed the participants' responses falling on a continuum from the highly conventional to the creative. At one end of the scale, some individuals (regardless of using the L1 or L2 and the type of metaphor task) were more inclined to use the least cognitively demanding response to complete the metaphor tasks, such responses were highly normative, familiar and rather effortless to produce and process. On the other end, some individuals were more prone to seek out a unique and original response in order to find a novel, surprising, and vivid way to complete the task.

The second aim of this study was then to look at how the variables obtained from these creative metaphor tasks may relate to other creativity measurements. It has become more commonplace to approach creativity from a multifaceted manner in order to grasp its multiple dimensions (Batey et al. 2006; Ward & Kolomyts, 2010 see Chapter 4 for a

detailed review of this). In Chapter 5, the broad set of creativity measurements that aimed to measure the varying facets of creativity, was discussed. It was shown in the study that the creative personality scale, the Five Factor Model of the Creative Personality Questionnaire (FFM-CPQ), had predictive strength for real world creativity, as measured by a self-report form that asked the participants about their past creative achievements in various domains of experience. As for the creative products, they exhibited very limited correlations with any of the other creative measurements. In contrast, scores on the creative metaphor tasks were found to have strong correlations with a number of the creative measurements, as indicated in Chapter 8.

In summary, these creative metaphor tasks have great potential for providing insight into the creative process. For example, the context independent tasks used in this study partially reflect the different stages of the creative process. A general model of the creative process typically involves four stages: analysis, ideation, evaluation, and implementation (Zeng et al., 2011; as also presented in Chapter 6). These stages can be represented in a model that shows the cognitive process of generating a creative metaphor and then providing an interpretation of it (see Figure 9.1) (see Birdsell, 2017 for a similar model for interpreting visual metaphors). The first stage is the analysis, when one confronts a metaphor task. One has to first understand the task and be familiar with the topic. Secondly, one needs to inhibit the conventional response. Then using ideation, one seeks out remote concepts and combinatorial possibilities through using divergent thinking. Finally, one needs to evaluate these possible combinations, which requires convergent thinking, refining and selecting the most appropriate response and then

provide an interpretation of it. The final stage, implementation, would involve actually using the metaphor or sharing it with others.

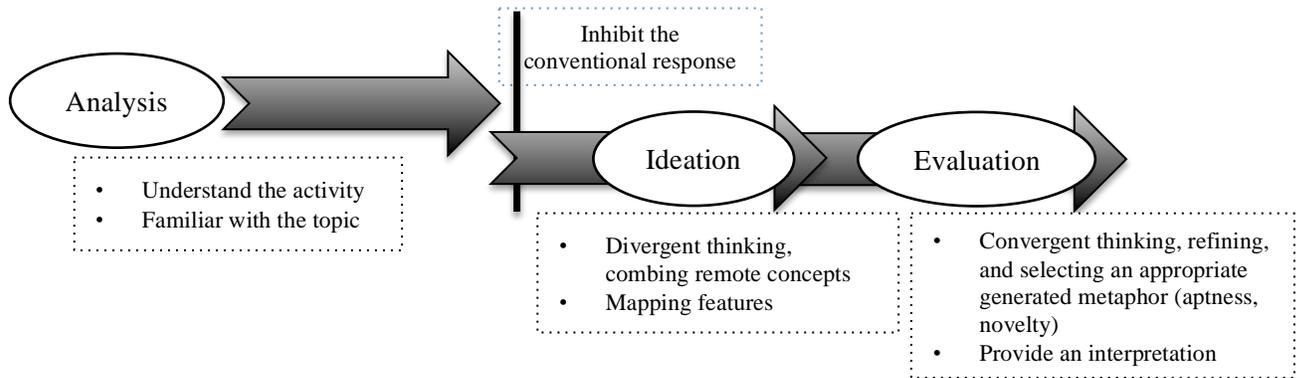


Figure 8.1: The creative process of generating a creative metaphor in the context independent task

Therefore metaphor research intersects with creativity research when creative and conventional metaphors are disentangled and viewed as involving separate cognitive processes. It is proposed here that *creative metaphoric competence* is an individual difference that involves a disposition towards uniqueness or novelty. This variance between individuals appeared regardless of the outcome and the language used to complete the metaphor tasks. That is to say, some individuals still sought out creative responses, even when they were well aware that this seeking out would have no immediate impact on their lives (i.e., the anonymous factor). These results indicate that some individuals are more inclined and prone to seek out semantic relations between distant concepts and this combinatorial ability is an important part of the creative process.

Theoretically *creative metaphoric competence* could be organized within the more established metaphoric competence framework, as outlined and proposed by Littlemore and Low (2006b). Specifically, Littlemore and Low (2006b) argued that metaphoric competence plays an important role in all of the language competencies, as

proposed by Bachman (1990) (see Figure 8.2). For instance, sociolinguistic competence refers to cultural knowledge that is shared among the speakers of that language, which is often expressed by way of metaphor. Textual competence, which relates to cohesion within text or spoken language, also widely uses metaphor for closing off an encounter and structuring an argument (Littlemore & Low, 2006b). *Creative metaphoric competence* is most closely linked with one of the language functions associated with illocutionary competence, namely, the imaginative function. Bachman (1990) describes this as the function that allows one to “create or extend our own environment for humorous or aesthetic purposes”, which includes “creating metaphor or other figurative uses of language” (p. 94). In this case, *creative metaphoric competence* is a narrow subset of a more general metaphoric competence and looks specifically at the imaginative function in language. Moreover, as argued in this thesis, this competency also is dependent upon a non-linguistic competency, or what might be called “creative cognition”. This is the ability to conceptually combine concepts together in novel ways and the propensity to seek out these combinatorial possibilities. This individual difference is projected onto language, which then is constrained by language competence at both the organizational and pragmatic levels, but appears within the imaginative function of language.

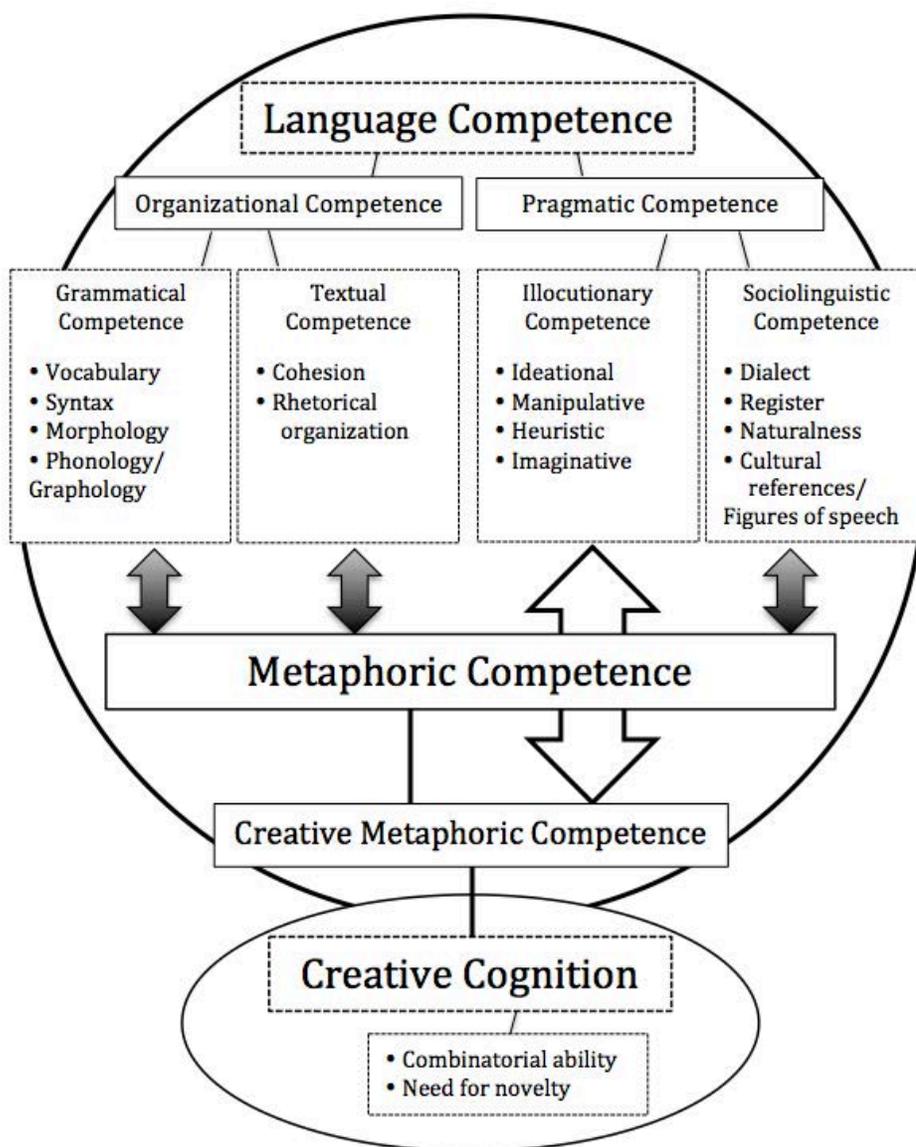


Figure 8.2: Bachman’s (1990, p. 87) components of language competence with Littlemore and Low’s (2006) metaphoric competence

### 8.3 IMPLICATIONS FOR THE CLASSROOM: DEVELOPING CREATIVE METAPHORIC COMPETENCE IN INDIVIDUAL LEARNERS

In this study, the ability to produce creative metaphors has been labeled, *creative metaphoric competence*, which is a sub-facet to metaphoric competence, a more general and all encompassing ability that also includes producing and understanding conventional

and familiar metaphorical expressions. This more general ability develops with lexical knowledge, especially in an L2, as demonstrated in a study by Azuma (2004), which showed larger lexical knowledge enhanced student's understanding and use of metaphorical expressions in the L2. Metaphoric competence in second language learning has been shown to be important for one's overall competence in that target language (Littlemore & Low, 2006) and numerous studies have looked for ways to integrate metaphor into the language-learning classroom (see Chapter 2.3.2). These studies have typically involved developing students' awareness and knowledge of conventional metaphorical expressions in the target language. In regards to *creative metaphoric competence*, this has largely been ignored.

Creativity has often been relegated to a peripheral role in the language learning classroom, but recent interest in creativity in natural everyday language has been steadily increasing (Carter, 2004; Cook, 2000; Veale, Feyaerts, & Forceville, 2013) and this increasingly also includes researching it from an L2 perspective (Bell, 2005; Nacey, 2013; Pitzl, 2011). For instance Pitzl (2012) examined the creative use of idioms and metaphors by performing a qualitative study using an English as a lingua franca (ELF) corpus. In her study, she found that metaphorical creativity is widely used by speakers from all different L1 backgrounds, but she did note, which is similar to the findings in this study, "differences between individual ELF speakers concerning the frequency with which creative idioms and metaphors are used – some speakers are clearly more prone to the use of these expressions than others" (Pitzl, 2012, p. 47). The findings in this research, which used a completely different method of data collection and analysis, found similar results.

*Creative metaphoric competence* relies less on vocabulary knowledge and knowledge of the conventional patterns and structures of the language and more on risk taking, combinatorial abilities, and exploring possible semantic connections. This competency nonetheless can be enhanced and should be viewed as a creative potential within the individual. Carter (2007) proposed, “further research needs to be dedicated to the development of creative competence in and through language” (Carter, 2007, p. 606). What Carter means by “creative competence” is probably not completely clear nor how this competency can be developed “in and through language”, but results from this study, which used creative metaphor tasks provide evidence for *a creative metaphoric competence* that did show up in both types of metaphor tasks and in two different languages. In order to find practical ways of developing *creative metaphoric competence* within the individual, the metaphor tasks in this study are one example of a pedagogical tool that could be used to teach students to expand and widen their semantic networks. In addition, as mentioned in the previous section, these metaphor tasks also have the potential to develop the creative process within the individual through ideation of novel ideas and then the evaluation of these ideas.

#### 8.4 IMPLICATIONS FOR CREATIVITY RESEARCH

So far, in this chapter I have provided a summary of this study and outlined a component of metaphoric competence, that is, *creative metaphoric competence*, and shown it as a discrete ability, which surfaced in individuals in both an L1 and L2. I have also briefly discussed how the tasks used in this study to measure *creative metaphoric competence* could be implemented in the classroom to develop language learners’ creative potential.

Now this section of the chapter examines the creative instruments developed for this study in more detail and considers some implications they have for creativity research in Japan.

Creativity has increasingly become an important part of education in Japan, as evidenced in the preamble in the Basic Act on Education from 2006, which stated, “we will implement education that values the dignity of the individual, that endeavors to cultivate a people rich in humanity and creativity” (MEXT, 2006b). Therefore as creativity has become one of the main pillars in education in Japan (and in many places around the world), it is crucial to consider ways to approach this term and more importantly to measure it. In addition to instruments that require the participants to generate a tangible product (similar to the poem, drawing tasks, or creative metaphor tasks), questionnaires and self-reports are also insightful ways to measure different aspects of creativity. For instance, The Past Creative Achievements Questionnaire from this study, which evolved from a number of self-report scales in the literature (Batey, 2007; Carson et al., 2005; see Silvia et al., 2012 for an assessment of a number of these self-report scales) and was developed to look at creativity from a wide range of domains of experiences (e.g., from music, art and writing to math, science, and computers) and spanned from everyday creativity (e.g., taken a music class) to more eminent forms of creativity (e.g., publicly played a music concert), has great potential to be used in creativity research in Japan. Using this instrument provides the researcher a variable to measure creativity under the assumption that past creative achievement is a good indicator of future creativity (see Barron & Harrington, 1981).

A second scale developed for this study was the Creativity Self-beliefs scale, which was also developed from previous research (Kaufman & Baer, 2004; Kaufman, 2006; Kaufman, Cole, & Baer, 2009). Again this scale looked at creativity from multiple different dimensions like arts and performance to science and math to the social self. This type of scale has been increasingly used in creativity research and has been shown to be a powerful predictor of educational attainment (Batey et al., 2010; Furnham & Bachtiar, 2008; Putwain et al., 2012). In this study, the creativity self-beliefs scale was not a strong predictor, but was still positively related to past creative achievements. Therefore this instrument could be used in various educational contexts within Japan to investigate the role creativity self-beliefs have on various tasks deemed important to creativity such as problem solving, hypothesis generation, and similar to this study, *creative metaphoric competence*. From a pedagogical vantage point, since strong relationships have been shown to exist in the past, it is important for those involved in education to find ways to boost learners' self beliefs in their creativity, especially if the goal of education is "to cultivate a people rich in humanity and creativity".

Finally, two personality questionnaires that aimed to measure the creative personality were developed for this study. One relied on items from the five-factor model of personality, which mostly comprised of Openness and Extraversion items. The second one brought together different traits commonly reported in the literature as being important for creativity such as: motivation, tolerance of ambiguity, curiosity, and persistence. The questionnaire developed from the five-factor model items showed good predictability for real life creativity and has the potential to be used as a short and viable way to measure the creative personality within the Japanese context. The second

questionnaire did not show any such predictability and did not correlate with most of the other creative measurements and therefore likely needs to be further modified to be applied in future studies.

Therefore it is recommended from the results of this study that the following three questionnaires have good potential to be used in future research by investigators within a Japanese context who aim to measure creativity from multiple different perspectives.

- The Past Creative Achievements Questionnaire (see Appendix G for the full list of items used in the final study)
- The Creative Self-Beliefs Questionnaire (see Appendix H)
- The Five Factor Model of the Creative Personality (FFM\_CPQ) (see Appendix D)

## 8.5 LIMITATIONS

This study was exploratory in nature and forming any generalizations from the results should be approached with caution. There were a few shortcomings in this study, which have been previously alluded to throughout the thesis. Most of these limitations were methodological in nature. The first limitation had to do with the method of data collection, which could have benefited from tighter researcher control in some places. For instance, despite each participant in this study using roughly the same amount of time (2 hours) to complete all of the steps, this research would have benefited from having a controlled timer monitoring the participants' time spent on each task. This would have provided additional information about the participants' engagement with these tasks, which could have provided insight into whether or not the creative responses actually

took additional time to generate. A second possible limitation, which is common in many studies, is that it could have used a wider range of participants. It would definitely be worthwhile and interesting to see and compare the results from different groups within the larger society (business employees, high school students, the elderly, etc.). Moreover this research was solely completed within a Japanese university context with Japanese as the L1 and English as the L2, it would also be prudent and informative to conduct a similar study using a different set of languages

In addition to the before mentioned methodical concerns, there are also some limitations with the materials used in this study. When contrasting and comparing results from a metaphor prompt in two different languages, there is always the possibility of a contaminating influence of context on the responses. The context independent tasks used generalizable and relatable topics for university students such as “Life” and “Love” and “Memories” and the context dependent task used a complete sentence that aimed to prime the participants to think of a topic like “Disappointment” and “Anger”. There is a certain amount of unknown influence that the topic prime had on the participants’ responses in each language. Obviously, it would make no sense to use the same topics, simply translated into the other language. Ideally, it would have been beneficial to reverse translate these two metaphor tasks and conduct another smaller and separate pilot study with a different group of participants in order to see if similar results could be discerned when the topic primes are in the opposite language. It is important for future research to consider these limitations and to resolve some of these shortcomings. In the next section, I discuss some possible directions for future research.

## 8.6 RECOMMENDATIONS FOR FUTURE RESEARCH: DIRECTIONS AND POSSIBILITIES

The findings and issues raised by this study indicate several possible directions for future research. For instance, future research needs to consider social and contextual factors that may influence one's creativity. This includes participants' expectant evaluation on the metaphor tasks and modulating the mood of the participants while completing these metaphors tasks. In addition, as discussed in the previous chapter, future research could also usefully explore the relationship between creativity and the emotions or the emotional side of creativity.

### The Effects of Expected Evaluation on Creative Metaphor Production Tasks

In this study, participants were told that all data collected would remain anonymous therefore they knew they were not going to be evaluated since this was not one of the aims of this study. Despite this lack of expected evaluation, a number of the participants still were motivated and produced highly creative responses to the tasks, but on the other hand, a number of participants also provided very simple, stereotypical and familiar responses. This raises the question, what would have happened if the participants knew they were going to be evaluated for their responses? Moreover what if the students knew that these evaluations would be conducted in two differing ways: informational (informal) or controlling (formal, grade-based) and how would this also influence their motivation to complete these tasks? These types of evaluations could also be extended beyond informal/formal dichotomy and include teacher/peer evaluations, too. These types of evaluations likely would have had an impact on their responses to the production tasks.

Shalley and Perry-Smith (2001) have conducted a similar study using the variables of expected evaluation and modeling by measuring creativity on job-related problems. In their study, they showed that participants scored higher levels of creativity when they expected to have an informational rather than a controlling evaluation. The point here is that minor adjustments like the prospect of evaluation or modeling the task may have important implications to the creativity scores. In this study, I have presented a rather static view of creativity as an individual difference, but doing further research could capture the more dynamic view of creativity and how social and contextual factors may inhibit or encourage higher levels of creativity.

#### Mood Modulation and Its Influence on Creative Metaphor Production Tasks

Similar to the above recommendation, another possible direction for future research involves mood modulation and its influence on creativity. One of the changes made in the final study had to do with changing the environment and procedure of collecting the data. In the pilot study, the participants sat at desks in a classroom and proceeded through each section in a rigid manner by following timed PowerPoint slides that guided them through all of the sections. The overall environment, the strict adherence to the timed slides, and the difficulty and unusualness of the tasks all likely contributed to high levels of anxiety among the participants. By and large, this negative affect likely adversely influenced their cognitive performance and thus had a detrimental effect on their efforts towards generating creative responses on the various tasks. This negative affect, especially in the form of elevated anxiety restricts working memory (Eysenck & Calvo, 1992) and may even restrict attentional focus (Gasper & Clore, 2002) to which Mirous and Beeman (2012) suggest that negative affect “may also narrow conceptual attention” (p, 334).

In short, it would be beneficial for future research to conduct creative metaphor production tasks in two varying conditions, one that induces negative affect (elevated anxiety) and one that induces positive affect. Previous studies show that positive affect enhances creative problem solving and insight into problems (see Mirous and Beeman, 2012), but as far as I know this has not been done with creative metaphor production tasks. Such a test could provide researchers a better understanding of how different research environments or social situational factors may enhance or obstruct creativity. This is crucial on two levels. First from a research perspective, it is important for researchers to be aware of the effects of situational factors on participants' creativity scores. Secondly in order to develop students' creative competence within an educational setting like a foreign language classroom, it is important to know which situational factors are conducive to creativity and which ones may inhibit it.

#### Creativity and the Emotions: Are Creative Responses More Emotional?

One additional and final point that I would suggest about future research, which I briefly touched on in the previous chapter, has to do with creativity and emotional valence. This was not analyzed in detail, but rather emerged from looking over the responses from the participants. It would be interesting to rate these responses using two groups of independent judges, one group for creativity and the other for emotionality. It is hypothesized that higher creativity scores would also score higher on emotionality. Most of the research on emotions and creativity, as mentioned in the above section, have looked at how positive moods enhance creativity (see Baas, Dreu, & Nisrad, 2008 for a meta-analysis of research that has addressed this topic), using a variety of methods such as creative problem solving (Estrada et al., 1994; Isen et al., 1987) and word association

tests (Isen et al., 1985). Despite this wide interest in investigating the influence positive or negative moods have on creative production, there has been scant research on how a creative product, in turn, influences an emotional response from the observer (or evaluator), as compared to a less creative product. Therefore one possible direction for future research is to look at the responses to the metaphor production tasks that have been evaluated as being highly creative and examine whether or not these are also highly rated for emotionality.

## 8.7 OVERALL CONCLUSIONS AND FINAL THOUGHTS

Reflecting on this thesis, I hypothesized that *creative metaphoric competence* is an individual difference that is projected onto both an L1 and an L2 and results from this study supported this hypothesis. That is to say, individuals differ in their ability, but more likely their propensity to seek out and explore creative metaphors. Moreover these creative metaphor tasks provide researchers an additional instrument to measure the creative process. Responses to the metaphor tasks varied in their creativity, yet the novel responses that were evaluated as being highly creative still had communicative intent for within these responses, the familiar could be found, appreciated, and provide coherence to the overall content of the sentence. Giora (2003) calls this “optimal innovation” or precisely “novelty that allows for the recoverability of the familiar” (p. 176). Creative metaphors, as one example of the more broad study of creative language, provide “a valuable window into the real-time activation of semantic knowledge and its use in language processing” (Coulson & Davenport, 2012 p. 401) and this thesis aimed to contribute to this growing body of research.

Creative metaphors provide a small glimpse into the creative process, a process that involves exploration and insight into a concept. For example, in the metaphor prompt “Life is \_\_\_”, a majority of the participants provided a conventional “journey” response or some variation of it (i.e., journey, trip, road, voyage, adventure, etc.), yet participant #60 responded with the following: “Life is an *unagai* (eel) restaurant” and provided the following explanation, “the sauce used for grilling the eel is passed on from generation to generation and each one trying to make it better and improve it for future generations”. In this instance, life is not progressing along a linear path, but it is knowledge learned and passed down from generation to generation. Such creative metaphors not only have the power to influence how one understands the topic, “life”, but also how one views the source, as in, the skilled trade of an *unagi* chef.

In sum, this study supports the idea that metaphors should not be viewed as a unitary type of figurative language. In contrast, metaphor types should be distinguished from the conventional and familiar to the novel and creative and this will further advance theories that aim to better understand creativity and language processing. The individual ability to cope with and produce semantic violations that are inherent in creative metaphors involves risk taking. It is risky because the combination does not adhere to a semantic rule and thus comprehension of the metaphor is more unpredictable. Some individuals are more prone to seek out this novelty and take this risk.

## Chapter 9 References

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