THE EFFECTS OF METAPHORICAL PRIMES AND ATTACHMENT STYLE ON

SELF-DISCLOSURE

BY

ANDREW B. COLITZ, M.A.

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CERTIFIED BY:

_____
Elizabeth Kudadjie-Gyamfi, Ph.D
Chair

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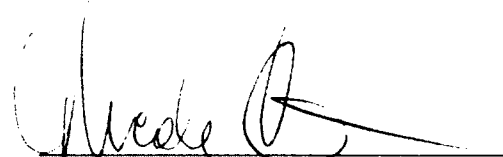
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Andrew B. Colitz, M.A.

Long Island University, Brooklyn Campus

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ABSTRACT

This research examined the effects of metaphoric thinking on intimacy and self-disclosure. The current study also examined the relationship between attachment style and intimacy and self-disclosure. Participants included 90 undergraduate and graduate students (28 males and 62 females) who were randomly assigned to one of three conditions: (1) a linguistic understanding of the visual prime, (2) non-linguistic embodied prime, and (3) control group. Overall, there were significant differences in the measure of intimacy and self-disclosure scores across the three conditions in that the two metaphorical experimental conditions had significantly higher intimacy and self-disclosure scores: likelihood of future friendship, felt closeness and intimacy, and degree of participant self-disclosure than the non-metaphorical control group. There, however, was no significant difference in intimacy and self-disclosure scores between the two metaphoric conditions. Also, there was no statistical significant relationship between secure attachment and intimacy and self-disclosure.

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Chapter I

Introduction

An ancient Indian parable, that still has great meaning in everyday life, is the story of the elephant and the blind men. In various versions of the tale, a group of blind men come across an elephant. The first blind man touches the elephant's leg and reports that it feels like a tree trunk. Another blind man feels the elephant's ear and thinks it is a fan. A third blind man grabs the elephant's tail and believes the elephant is a piece of rope. After comparing notes they realize they are in complete disagreement. The ancient tale highlights the numerous ways humans experience, interpret, and make judgments about the world around them.

The current study examined the impact of metaphors in interpreting one's social environment. The basic assumption is that metaphors establish correspondences between concepts from different domains of knowledge. In their seminal book, Lakoff and Johnson (1980) defined metaphors as cognitive tools used to transfer characteristics of a difficult abstract concept, in terms of another, more accessible and familiar concrete concept. They posited that metaphors not only make our thoughts more vivid and interesting but actually structure and organize the way we think and act. Using this perspective as a theoretical framework, metaphor is a unique and compelling cognitive mechanism that allows individuals to organize concepts.

Researchers are only beginning to look at the impact of metaphors in influencing interpersonal relations. Given the emerging interest within social and cognitive psychology, surprisingly little empirical research has examined how metaphors are processed, evaluated, and affect intimacy and self-disclosure within interpersonal

encounters. The goal of the current research was to gain a better understanding of the unique characteristics and thought processes of individuals that initiate a move toward thinking metaphorically and how those cognitive processes might subsequently impact intimacy and self-disclosure within an interpersonal encounter in a new relationship.

This study investigated the importance of "metaphorical" or context-induced conceptualization of metaphor, through a priming task, on a "getting-to-know-you" relationship task. Participants were primed through the use of embodied primes, which exposes individuals to (1) non-linguistic concrete sensory experiences and non-consciously influences subsequent judgments as well as (2) linguistically conceptualizing the presented visual prime. There has not been a direct comparison of how non-linguistic embodied primes compare to linguistic primes influence participants' willingness to disclose intimate and personal information. Similarly, the study accounted for self-disclosure and intimacy within a new relationship, as a process, through an examination of the emerging context of a naturally occurring social interaction. (Collier, Faidley, & Schilling, 2009).

Finally, the current study concentrated not only on how contextual factors such as primes impact intimacy and self-disclosure in a relationship, but examined how attachment style influenced interest in and behavior towards intimacy and self-disclosure in relationships.

Chapter II

Literature Review

You Begin

You begin this way:
this is your hand,
this is your eye,
that is a fish, blue and flat
on the paper, almost
the shape of an eye.
This is your mouth, this is an O
or a moon, whichever
you like. This is yellow.

Outside the window
is the rain, green
because it is summer, and beyond that
the trees and then the world,
which is round and has only
the colors of these nine crayons.

This is the world, which is fuller
and more difficult to learn than I have said.
You are right to smudge it that way
with the red and then
the orange: the world burns.

Once you have learned these words
you will learn that there are more
words than you can ever learn.
The word *hand* floats above your hand
like a small cloud over a lake.
The word *hand* anchors
your hand to this table,
your hand is a warm stone
I hold between two words.

This is your hand, these are my hands, this is the world,
which is round but not flat and has more colors
than we can see.

It begins, it has an end,
this is what you will
come back to, this is your hand.

(Margaret Atwood, 1978)

How Metaphors Structure an Understanding of Social Concepts

Margaret Atwood's (1978) poignant poem demonstrates the complexity of human life and how metaphors enable us to understand increasingly abstract concepts. In the opening stanza, the parent (and poet) introduces the child (and audience) to the concrete world: "this is your hand," "this is your eye," "this is your mouth." We "begin" as infants relentlessly trying to understand and make sense of our surroundings from our physical bodies. Our hands explore and bring things within reach, our eyes visually discern our environment in primary colors of "blue" and "yellow, " while our mouth sustains growth and connects us to a caregiver. Next, Atwood moves to more abstract notions: "Outside the window is the rain, green because it is summer." Thus the concrete objects--the rain, the green (trees, grass)--signify the abstract concept *summer*. In the fourth stanza, Atwood describes more profound change as the child discovers that earlier perceptions no longer hold. Words have power in this new world. Words cloud reality as well as anchor and define it. The child's hand is now a fist, "a small stone," held between the two hands, "two words," of the mother. In the sixth stanza, the mother helps the child appreciate her presence as a separate other, "these are my hands." Even beyond their relationship is a world infinite in complexity, "which is round and has more colors than we can see." In the last two stanzas of the poem, Atwood returns to the beginning. Our minds can wonder and contemplate vast amounts of ideas but we will always return to our physical Earth and the body we live in.

Schema perspective. In trying to understand the complexity of abstract concepts, recognizing and classifying objects, or discovering meaning in poems, the established view in social cognition is that people process information using schemas or mental

structures (Bartlett, 1932; Kunda, 1999). The assumption is that people develop working models or "scripts" of their experiences that contain representations of knowledge about categories of *similar* stimuli (Baldwin, 1992). Schemas help people quickly and efficiently process social information, classify and organize acquired knowledge into categories, and later utilize this knowledge for handling novel situations. For example, a young child may first develop a schema for a tree. She knows that a tree has a long trunk, thin branches, and green leaves. When the little girl encounters a flower for the first time, she might initially call it a tree. After all, it fits with her schema for the characteristics of a tree. Once she is told that this is a different plant called a flower, she will modify her existing schema for a tree and create a new schema for a flower.

Research shows that people are more likely to attend to and recall information that is consistent (versus inconsistent) with their schemas (Cantor & Mischel, 1979). People interpret and evaluate social stimuli in line with accessible schemas, even when those schemas are primed outside of conscious awareness (Banaji, Hardin, & Rothman, 1993). In one such study (Bargh & Pietromonaco, 1982), participants primed with hostile words interpreted another's behavior as more aggressive and judged than when participants were not primed with hostility. These and many other findings constitute an enormous body of work documenting schemas' far-reaching influence on people's construal of their social environment.

Embodied cognition perspective. In recent years, embodied cognition theorists have hypothesized that abstract mental representations of concepts are determined by an individual's sensory-motor experience based on physical interactions with the world (Barsalou, 1999). Traditional views in the philosophy of mind and cognitive science have

considered the body as peripheral to understanding the nature of mind and cognition. Proponents of embodied cognitive science, however, view this as a serious flaw. They argue for the dependence of cognition on the body. In particular, recent experiments suggest that concepts with verbal labels are processed not only in the language center but also in motor and perceptual areas. For example, the words "digs," "climbs," and "walks" are stored in speech centers but also in specific regions of the brain where such motor operations usually originate (James & Gautier, 2003). It appears that the word and the perceptual-motor experience are both being activated in parallel to create a whole experience.

Similarly, neuroscientists have recently discovered a system in the brain, based on "mirror neurons," which sit adjacent to motor neurons. Mirror neurons will activate in an observer who is doing nothing but watching another person behave (Rizolatti & Craighero 2004). When watching one reach for a book, the pattern of neuronal activation in the observer mimics the exact pattern that the observer would use if reaching for a book. This permits one to virtually participate in another's actions without having to physically imitate them. We experience the other as if we were executing the same action, or feeling the same emotion (Damasio, 1999). This "participation" in another's physical actions creates a sense of understanding of their particular intentions and behavior (Gallese, 2001). For instance, studies using functional magnetic resonance imaging (fMRI) have shown that observing pain in others is mediated by several brain areas that process emotional aspects of pain (Jackson, Rainville, & Decety, 2006). In one study, participants either received a moderately painful stimuli or observed their partner (who was present in the same room) receiving a moderately painful stimulus (Singer,

Seymour, O'Doherty, Kaube, Dolan, & Frith, 2004). The same regions of the brain were activated during both trials. These results lend support to the idea that common neural circuits are involved in representing one's own and others' affective and motor states (Boston Change Process Study Group, 2008).

Even though our bodies cannot have direct physical experiences with abstract concepts, the notion of embodied cognition, provides a framework in which mental representations of abstract concepts can still be grounded in sensory-motor experience (Barsalou & Wiemer-Hastings, 2005). Concepts concerning the physical world (e.g., distance, size, or temperature) are based on direct concrete experience (Mandler, 1992), and do not require the language abilities or memory retrieval skills that come in later years. According to embodied cognition theorists, Bargh and Shalev (2012), abstract concepts derive from, and are associated with, these experienced physical concepts. This associative relation explains how individuals easily and fluently use physical terms to describe more abstract phenomena. Solomon Asch (1958) was perhaps the first social psychologist to note this phenomenon in common discourse:

When we describe the workings of emotion, ideas, or trends of character, we almost invariably use terms that also denote properties and processes observable in the world of nature. Terms such as warm, hard, straight refer to properties of things and of persons. We say that a man thinks straight; that he faces a hard decision; that his feelings have cooled. We call persons deep and shallow, bright and full, colorful and colorless, rigid and elastic. Indeed, for the description of persons we draw upon the entire range of sensory modalities... (p. 86-87)

Research in cognitive linguistics, since Asch, has suggested that individuals interpret the world in large part by evaluating information using their knowledge about di*ssimilar* stimuli (Lakoff & Johnson, 1980, 1999). In other words, people organize their experience through metaphors by implicitly juxtaposing two distinct domains. When two thoughts, meanings, or perceptions are identified simultaneously, there is the possibility of representing or symbolizing one of them by reference to the other. Generally, we call this an association, as in, "whenever I smell burning leaves, I think of summer camp." The meaning (summer camp) is mapped on to the sensual experience (burning leaves), lending significance to the scent of burning leaves.

Defining metaphor. The term metaphor derives from the Greek *metapherein*, meaning "to transfer," in that a metaphor transfers the meaning or elements of one thing (or concept) to another (Lakoff & Johnson, 1980). Metaphors involve the use of images or concepts from one field of experience to describe some other field of experience in such a way as to suggest certain parallels, commonalities, or useful connections between the areas. Metaphors are "meaning transports" which extend our level of comparison by "smuggling extra dimensions into our analysis" (Olds, 1992, p. 24). The power of metaphor resides in its capacity to hold both similarities and differences between two compared objects or events. This power of analogy opens up fruitful contrasts and comparisons and actually serves to bring into consciousness many of the unconscious assumptions already present (Black, 1962).

Aristotle defined metaphor as a linguistic device comparing dissimilar things, which can aid in interpreting how dissimilar things may be alike (Butcher & Roberts, 2006). Nietzsche maintained a broader stance of metaphor, by arguing that "truth" is

understood indirectly in terms of more concrete experiences (Levy & Mugge, 1974).

Recent philosophers interested in human symbolic thought believe that metaphor is a

central component of human cognition that is regularly used to understand and

communicate abstract or indescribable ideas (Arendt, 1977; Langer, 1979). Lakoff and

Johnson (1980) defined metaphors as cognitive tools used to transfer characteristics of a

difficult abstract concept, in terms of another, more accessible and familiar concrete

concept. They posited that metaphors not only make our thoughts more vivid and

interesting but actually structure and organize the way we think and act. Using this

perspective as a theoretical framework, metaphor is a unique and compelling cognitive

mechanism that allows individuals to organize abstract concepts.

Conceptual metaphor theory (CMT). This metaphor-enriched perspective is

referred to as Conceptual Metaphor Theory (CMT) by Lakoff and Johnson (1999), which

complements the traditional schema and embodied cognition perspectives in processing

information. Because people have structured their knowledge about how their bodily

states and actions relate to each other and to the world, a metaphor-enriched perspective

explains how people use this structured knowledge to process information about

dissimilar concepts.

Compiling the research of other cognitive scientists, Lakoff and Johnson (1999)

explained metaphorical processing in four parts: (1) Johnson's Theory of Conflation, (2)

Grady's Theory of Primary Metaphor, (3) Fauconnier and Turner's Theory of Conceptual

Blending, and (4) Narayanan's Neural Theory of Metaphor. Johnson's (1997) Theory of

Conflation states that connections between subjective emotions and sensory-motor

experiences develop early in childhood. For example, affection is typically correlated

with the warmth of being held—an infant repeatedly feels the emotion and the sensory-motor experiences at the same time, which leads to conflation or "undifferentiated experience." During a later phase of differentiation, the two domains (affection and warmth) that have been linked together are separated out but the cross-domain associations endure and form the mechanisms for metaphorical mapping. These metaphors are called primary metaphors. In the example above, one would think of affection in terms of warmth as in "a warm embrace." Another example is "a close friend," where there exists a metaphorical mapping from the domain of affection to the domain of the sensory-motor experience of being held closely to a person. In Lakoff and Johnson's view, thought begins with primary metaphors and builds from there, with ever more complex metaphors being constructed on the basis of the metaphor experience that has come before. They specifically stated:

> What we understand the world to be like is determined by many things:
> our sensory organs, our ability to move and manipulate objects, the
> detailed structure of our brain, our culture, and our interactions in our
> environment, at the very least. What we take to be true in a situation
> depends on our embodied understanding of the situation, which is in turn
> shaped by all these factors. Truth for us, any truth we can have access to,
> depends on such embodied understanding" (p. 102).

This preverbal embodied understanding of the world, based on concrete experiences, allows the child to form abstract representations of meaningful emotional categories.

Grady's (1997) theory of primary metaphor states that complex metaphors are "molecular" constructions of the "atomic" parts (or primary metaphors). The construction

process is called conceptual blending and is further explained by Fauconnier and Turner (1998; 2003). They stated that distinct domains can be co-activated and that under certain conditions new cross-domain associations can be established. Thus, novel "blends" of previously separate metaphorical domains come into existence leading to the creation of complex metaphors. Finally, Narayanan's Neural Theory of Metaphor (1997) explains that the associations created during the phase of blending are actual neural connections in the brain.

Constructivist perspective. Investigators have proposed that all knowledge involves the construction of meanings in addition to the acquisition of information (Overton, 1994). Since knowledge and meaning is mediated via symbols, once a meaning is constructed, it can be expressed by any one of three modalities or by a combination: physical actions and gestures, images and fantasies, and spoken words (Cassirer, 1946). In examining how individuals come to understand their reality a crucial question is whether there is an objective reality. A great deal of twentieth-century western philosophy has argued from a logical positivistic perspective (Barofsky, 2012). Ortony (1993) stated that a basic notion of positivism was that "reality could be precisely described through the medium of language in a manner that was clear, unambiguous, and, in principle, testable" (1993, p. 1). However, philosophers of the past century have been aware of the need for an embodied mind. Husserl (1962, 1989) assumed that reflection can only accentuate or intensify lived experience. Sartre (1976) concurred by saying that reflection only discloses what is already familiar in the pre-reflective, lived experience. The presence of an embodied mind is implicit in these reflections, as is the notion of

embedding verbal reflection on to embodied experience. Lakoff and Johnson (1999) proposed a constructionist view that subjective reality is constructed:

> Embodied truth requires us to give up the illusion that there exists a unique correct description of any situation. Because of the multiple levels of our embodiment, there is no one level at which one can express all the truths we can know about a given subject matter. But even if there is no one correct description, there can still be many correct descriptions, depending on our embodied understandings at different levels or from different perspectives (p.109).

Theories of metaphor in philosophy, linguistics, and psychology address metaphor use as a form of linguistic expression as well as a form of conceptual representation and symbolization (Glucksberg, 2001). A large experimental and psycholinguistic literature has emerged on the comprehension and interpretation of linguistic metaphors (McCurry & Hayes, 1992). First, it is important to recognize how prevalent metaphor usage is in our everyday language. Graesser, Long, and Mio (1989), for example, argued that one out of every 25 words expressed on television programs is a metaphor. Since metaphoric expressions are uttered about six times per minute (Gibbs, 1994, 2006) and are comprehended quickly and without special effort (Glucksberg & Keysar, 1990), they are usually inferred as seemingly literal meanings.

Conceptual mapping studies. Researchers in cognitive linguistics are beginning to look at the impact of metaphor as a conceptual representation. They have identified countless conventional expressions that metaphorically relate social concepts to dissimilar concepts. Lakoff and Johnson's (1980) seminal analysis posited that

metaphors are not just a matter of language but of thought and reason. As previously mentioned, metaphors operate as conceptual mappings between concrete source concepts and dissimilar target concepts. Source concepts represent commonplace, familiar knowledge derived from routine embodied interactions with the physical and social world. Target concepts, in contrast, represent relatively more abstract referents, which may be more difficult to grasp. Conceptual mappings involve mental associations between corresponding elements of the source and target concepts. Through these mental associations, people are able to use select pieces of knowledge about the source concept as a structured framework or schema for reasoning about, interpreting, and evaluating information related to a dissimilar target concept (Gentner, 1983).

Consider an example of conceptual mapping between a concrete concept (physical closeness) to elements of an abstract concept (emotional intimacy). The following common utterances are often used to talk about physical closeness and emotional intimacy: "I feel close to him." "We're attached at the hip." "You couldn't separate us." "He keeps everyone at arms length." "She distances herself." Lakoff and Johnson argue that these linguistic phrases provide a window into the associations created by a conceptual metaphor; emotional intimacy is physical closeness, which uses knowledge about distance (a concrete source concept) to structure an understanding of intimacy (an abstract target concept).

There have been a handful of studies that examine metaphors' role in how people structure their individual thoughts and behaviors with respect to attention and memory processes. Research thus far takes a metaphor-focused approach in that it identifies a metaphor reflected in ordinary language (i.e. "power is up") and assesses whether that

metaphor operates at a conceptual level to influence information processing (Sopory &

Dillard, 2002). For example, linguistic analyses (Lakoff & Johnson, 1980; 1999) show

that people conventionally use social power metaphors that implicate terms of vertical

positions: "You are in high spirits today." "He reached the top of the corporate ladder."

"She's climbing to the top." While similarly talking about concepts implying negative

valence and powerlessness in terms of low vertical positions: "I have never felt so low."

"He's starting at the lowest rung of the company." "I've hit rock bottom."

Schubert (2005) tested the hypothesis that the abstract concept of power involves

a perceptual simulation of concrete vertical differences in space. In one study,

participants were more accurate and faster in judging a group's social power when

powerful groups were presented at the top of a computer screen and powerless groups

were shown at the bottom of the screen. Another study showed that participants made

quicker and more accurate identifications of powerful groups when making judgments

using an upward movement (using an UP cursor key). The conceptual metaphor

framework suggests that these expressions reflect a metaphoric understanding of valence

and power (abstract concept) in terms of verticality (concrete concept). If this is correct,

one would expect variations in verticality perceptions to systematically relate to people's

attention and memory for valence and power-relevant information.

Support the metaphor of verticality have been related to people's attention and

memory. Correlational evidence shows that depressive symptoms and self-perceived

social power can be expressed by verticality metaphors. For example, individuals who

scored high (versus low) in depressive symptoms preferentially directed their attention to

lower areas of vertical space (Meier & Robinson, 2006), and those who perceived

themselves as powerful were quicker to attend to higher spatial locations (Moeller, Robinson, & Zabelina, 2008).

Extending these findings to memory processes, Crawford, Margolies, Drake, and Murphy (2006) presented participants with positive and negative images in different spatial locations and found that participants recalled positive images as appearing in higher locations relative to negative images. An important aspect of this methodology is that the stimuli and response were both non-verbal, thus providing a test of the non-linguistic operation of conceptual metaphor. Thus, consistent with Meier and Robinson's (2006) findings, there was a pattern that predicted that space is used to represent affect.

In a creative extension of this work, Meier and Hauser (2008) showed that such congruence effects occur not only with respect to the spatial position of the stimulus, but also with respect to the spatial position of participants' motoric response. When participants evaluated words by either pressing a key with a finger or pressing a pedal with a foot, there was a similar congruence effect, such that positive evaluations were faster when made with the upper body than with the lower body, and vice versa for negative evaluations. In addition, it was found that participants thought that tattoos with positive meaning should be placed higher up on the body than tattoos with negative meaning. Combined, these studies indicate that the association between valence and verticality affects not only immediate shifts of spatial attention, but also expectations about the spatial position of positive and negative items.

Spatial locations can be defined with respect to multiple frames of reference, such as the frame defined by the body (head is UP, feet are DOWN) and the frame defined by the environment. Research participants are typically upright which aligns these reference

frames and makes it unclear, which is being used to define vertical position. In order to determine whether GOOD is associated with the body's UP or the environment's UP, Meier et al. (2007) had participants lie on their sides, thus dissociating the two frames of reference. Words were presented in four quadrants of a screen, which corresponded to locations that were UP in both environmental and bodily space, DOWN in both, or UP in one frame but DOWN in the other. Participants evaluated each word as quickly as possible. The results showed that participants were faster to evaluate words that appeared in metaphor congruent locations with respect to the body (GOOD toward the head, BAD toward the feet), but there was no such effect with respect to the environmentally defined coordinate system. This study provided initial evidence that GOOD is associated with the top of the body, even if it is not upright, and not necessarily with the upper region of external space.

A metaphor-enriched conceptual view suggests that a complete account of the meanings people give to abstract concepts requires an understanding of how individuals make sense and structure those concepts. In previous empirical studies researchers had preconceived conceptual metaphors that they were examining (i.e. "power is up," "emotional intimacy is closeness," "emotional intimacy is warmth") (Schubert, 2005; Williams & Bargh, 2008a, 2008b). Researchers assumed, without evaluating, participants' perception of the researchers' predetermined conceptual metaphors. Their studies relied on unconsciously manipulating or priming one domain (i.e. vertical height, closeness, or temperature) and examined how it transferred over to a dissimilar domain (i.e power or intimacy). This study took a different approach, since individuals usually construct multiple meanings and attribute a variety of metaphorical meaning to a given

stimuli or prime. This investigation examined how one thinks metaphorically after viewing animated clips of interacting shapes in a visual prime and how this might impact self-disclosure and perceived intimacy in an unrelated relationship task with a confederate.

In line with the arguments above, when individuals metaphorically comprehend something in particular situations, they are under two kinds of pressure: the pressure of their embodiment and the pressure of context. Kövecses (2010) distinguishes two basic kinds of context: global and local. Global context refers to the contextual factors that affect all members of a language community when they conceptualize something metaphorically. When we engage the world and metaphorically conceptualize it, we unconsciously monitor and pick out certain details. This world consists of our body, the physical environment, the physical and social aspects of the settings in which we act, and the broader cultural context (Kövecses, 2010). For example, there are differences in the physical environment in which people live, and because people are (mostly unconsciously) attuned to these differences, metaphorical conceptualizations vary. By local context, Kövecses describes the immediate contextual factors that apply to specific situations, such as two students in a room getting to know each other by asking and answering a variety of questions.

In recent years, a large number of scholars have criticized the theory of conceptual metaphor for a variety of reasons (McGlone, 2007; Ritchie, 2003). Perhaps the most significant criticism was the suggestion that conceptual metaphor theory ignores the study of metaphor in the context in which it actually occurs. The argument is that the practitioners of "traditional" conceptual metaphor theory (such as Lakoff and Johnson)

set up certain, conceptual metaphors and exemplify them with groups of invented metaphors. In this way, researchers in conceptual metaphor theory fail to notice some of the essential aspects of metaphorical phenomena. For example, Kövecses (2010) defines metaphoric creativity, as a "context-induced creativity," that is based on the context of the metaphorical conceptualization and the resulting metaphorical processing. Rather than investigating a predetermined conceptual metaphor, the current study investigated a form of "metaphorical creativity" and context-induced conceptualization of metaphor through a priming task prior to an interpersonal exchange between a research participant and a confederate. This kind metaphorical conceptualization has not been systematically explored in the social cognitive literature on metaphor to date.

The review will now shift to focusing on how metaphors not only structure one's individual thoughts but act as organizing frameworks for an intersubjective exchange, creating intimacy between two people. The review will focus on a handful of priming tasks that manipulate psychological states by implicitly influencing how people process and perceive intimacy in relationships.

How Metaphors Create Intimacy and Structure an Interpersonal Exchange

Most psycholinguistic research has focused more on how metaphoric expressions are understood rather than on the interpersonal impact of metaphoric expression. While metaphoric expressions can help comprehend novel or difficult abstract concepts (Ortony, 2001), metaphors also enable speakers to achieve other, more socially oriented objectives (Gibbs & Gerrig, 1989). Cohen (1979) argued that a critical function of metaphor is the "achievement of intimacy... in which the maker and the appreciator of a metaphor are drawn closer to one another" (p. 6). The basic claim is that feelings of

intimacy between speakers and addressees are created through their mutual understanding of particular metaphoric expressions.

A sparse literature suggests that the use of metaphor is important in developing greater intimacy between two people. In the psychotherapy literature, for example, one of Siegelman's (1990) arguments is that "affect and metaphor are closely connected" (p. 6) and that clients often make use of metaphors when they want to convey intense feeling states that cannot be easily communicated in other ways. Vivona (2003) takes this a step further by noting that metaphors not only bridge verbal and sensory-motor experience but also allow the client and the therapist to "embrace" each other, thereby enabling interpersonal as well as intrapsychic connection. Barker (1996) maintained that the therapist should take into account the language style, vocabulary, and primary sensory channels used by the client in processing information. When a therapist responds to a patient by matching their primary sensory experience (e.g.: visual—"I see what you mean"), (e.g.: auditory—"That sounds pretty bad"), or (kinesthetic—e.g.: "That feels about right") there is greater empathic and attuned understanding. Pearce (1996) further argued that if the therapist is reflecting back the patient's metaphorical expressions by similarly matching the sensory modality, the cadence, and tone in which the metaphors are shared, then this process helps emotionally regulate and allow greater connection between patient and therapist.

Metaphoric transfer effect. Within the social-cognitive experimental literature, a handful of studies have demonstrated that manipulating perceptions, sensations, and other sensory-motor states through embodied primes produces metaphor-consistent changes in how information is attended to, recalled, and interpreted in interpersonal relationships.

Landau, Meir, and Keefer (2010) conducted a review of 36 studies describing a proposed mechanism of embodied primes that exposes individuals to concrete sensory experiences, which nonconsciously influences subsequent judgments. For example, when interacting with the physical world, people tend to approach desired objects and pull them toward themselves, whereas they distance themselves from undesirable objects or push them away from the self (Elliot, 2008). On the basis of analyses of ordinary language, Lakoff and Johnson (1980) argued that people use knowledge of these physical interactions to conceptualize positive valence as toward/close and negative valence as away/distant (e.g. "I am embracing my new position." "We are moving away from this town." "Those two lovebirds are inseparable." "She is repelled by the thought of him.") Williams and Bargh (2008a) showed that subtly manipulating perceptions of spatial distance/closeness led to consistent changes in participants' perceptions of their emotional attachments to significant others. Specifically, participants who were asked to place two dots far apart on a plane subsequently perceived a weaker emotional bond with their family members compared with participants who placed the dots close together.

Researchers have also examined how manipulating sensations related to concrete concepts may produce metaphoric transfer effects on social perception. Williams and Bargh (2008b) provided evidence that interpersonal warmth is understood partly in terms of physical warmth (e.g., "I got a chilly reception at the meeting") by showing that participants who simply held a warm (versus cold) beverage subsequently described a target individual as having a "warmer" (i.e., generous and caring) personality. In a related finding, IJzerman and Semin (2009) showed that participants holding a warm (versus cold) beverage rated themselves as being emotionally closer to their friends and family.

Zhong and Leonardelli (2008) showed that participants who recalled a time when they were socially excluded (versus socially accepted) perceived the temperature of the room to be an average of five degrees colder, even though the room temperature was the same for both groups.

These findings demonstrate that manipulating experiences with sensory perceptions of physical warmth has metaphoric-consistent effects on perceiving and processing an abstract concept of interpersonal warmth. Considering Williams and Bargh's (2008a, 2008b) findings, the concept of friendliness is rich with representations of bodily states including temperature-related sensations (e.g. "warm embraces" or "melting in her presence") that regularly occur during friendly and intimate interpersonal encounters. However, gripping a warm paper cup is not likely to be among them, suggesting that the observed link between warm-cup sensations and judgments of interpersonal intimacy reflects, beyond experiential correlations, a metaphoric mapping between the embodied concept of physical warmth and the abstract concept of emotional intimacy.

Another priming study that manipulated psychological states by implicitly influencing how people process interpersonal relationships demonstrated that metaphors evoking connection (versus boundaried protection) with others may actually prime interest in intimacy. Specifically, Landau et al. (2010b) proposed that people conventionally talk about an unwillingness to disclose aspects of themselves to others as the physical protection against perceived external threats (e.g. "He refused to let his guard down" or "She would not let anyone inside") (Lakoff, 1997; Moser, 2007). To test this hypothesis, the researchers exposed some participants to a sequential animated

depiction of a sphere being protected by a surrounding layer against intruding agents. Participants in the control condition viewed similar stimuli that interacted in a way that did not depict protection. Following the prime manipulation, participants chose from a range of intimate questions (i.e. "Do you like warm or cold weather?", "What are your spiritual or religious beliefs?", "When is the last time you have felt alone?") that they would be willing to disclose in an upcoming conversation with a stranger. Landau et al. (2010b) found that participants primed with entity protection elected to answer fewer intimate questions compared to participants in the control condition. However, Landau et al.'s study is limited by only evaluating interest, not actual behavior towards self-disclosure and intimacy in a relational encounter. The current study built on the Landau et al. (2010b) study and addressed that gap in the literature by evaluating both interest and behavior towards self-disclosure and intimacy in a relational encounter with a confederate.

Taken as a whole, the empirical findings demonstrate metaphors' influence in a wide range of social psychological phenomena and support the claim that metaphors shape how people conceptualize and process—and not merely talk about— perceived intimacy in relationships. In none of these studies were participants exposed to linguistic or verbal processing reflecting the metaphors of interest. In addition, there was a need to address how embodied metaphorical primes relate to linguistically understanding and framing an abstract stimulus.

The review will next address the impact of embodied primes relying on activating and integrating sensory-motor experiences and linguistic processing of visual stimuli.

The Theoretical Rationale for Embodied Primes

William James stated that the mere act of thinking about a behavior increased the

tendency to engage in that behavior: "We may lay it down for certain that every

representation of a movement awakens in some degree the actual movement which is its

object" (1890, p. 526). James' idea of awakening here is similar to modern notions of

accessibility, in that the activation of a representation (i.e. through imagining the

behavior) increases its likelihood of activation (Bargh, Bond, Lombardi, & Tota,

1986). Priming research has its roots in Hebb's (1949) seminal work on internal mental

representations. Hebb's model suggested that internal representations could remain

"electrically active" for a short time independent of external stimulation (Donald, 1991,

p. 361). For Hebb, this is a necessity for any learning. In order to unite a representation

containing different elements, the mind must keep the other elements active while

attention shifts. This idea of activation of a mental representation was crucial to the

notion of priming, which Karl Lashley (1951) introduced in his analysis of language

production. In order to comprehend any typical sentence (especially in spoken language)

Lashley stated that one must keep the earlier elements in mind until the end of the

sentence. Lashley (1951) was the first to use the term priming to describe the preparatory

function of language. To be able to speak words in an understandable, sequential fashion

requires a priori organization of the representations that are to be used. Thus, like James

and Hebb, Lashley argued for the necessity of a direct connection between thought and

behavioral representations.

In a recent review, Custers and Aarts (2010) noted that there has been an increased interest in the field of social cognition in examining the unconscious activation or implicit priming of stored mental representations. In fact, there is mounting evidence that a wide range of concepts and constructs can be implicitly primed, including attitudes, emotions, attachment style, and goals (e.g. Baldwin et al., 1996; Chartrand & Bargh, 1996). Priming heightens the accessibility of available information (Martens & Kiefer, 2009). Once concepts become temporarily accessible, the activation spreads to related concepts that are capable of directing cognition and subsequent behaviors (Moskowitz, 2005). Bargh and Williams (2006) suggested that implicit priming procedures allow researchers to get a glimpse of an individual's cognitive organization by uncovering associations and attitudes that are virtually unknown to the individual. Thus, the presumption behind priming was that such preconscious influences would play a stronger than usual role in subsequent behavior, especially towards another person since the perceiver would not be aware of the interpretive bias and therefore could not correct for it (Bargh, 1989).

Priming individuals with non-linguistic stimuli activates and evokes sensory-motor experiences that operate on a prereflective or preverbal level. Similar to the embodied cognition and conceptual metaphor theories previously mentioned, features of abstract or less understood concepts are mapped onto existing and well-understood concepts, such that the structure of the developmentally earlier, primary concept is retained (Bargh, 2006; Werner & Kaplan, 1963). When an abstract concept is scaffolded onto a foundational concept, these concepts become associated (Williams, Huang, & Bargh, 2009). Beginning in infancy, humans process some events more readily than

others. If a toy mouse disappears behind one screen and reappears behind another screen infants are surprised (Aguiar & Baillargeon, 1999). The infant's alertness in perceiving features of the natural environment suggests that humans readily process certain types of information about the natural environment (Baillargeon, 2004).

When constructed, a meaning synthesizes a person's present and past experiences with the objects in question. Consider, for example, a two-year watching her father place a hat on his head and leave the house saying, "See you later." Sitting in a high chair, the child places a napkin on her head as her father has done many times in a play ritual. This behavior integrates and synthesizes properties of past experiences represented in a symbolic action and the meaning representing her connection to her father. This illustrates that the triad of experiencing, knowing, and symbolizing is contextual and embodied, integrating patterns of sights, sounds, actions, tactile and kinesthetic perceptions, and spoken words (Santostefano, 2004). The way that meanings are constructed and the types of meanings that toddlers construct in the first years of life become especially important if we accept the developmental principle that early meanings are not replaced by later meanings but become integrated with them (Werner & Kaplan, 1963). Metaphor allows the rich meanings we bring to dissimilar concepts to be organized around the creation of new meaning (Olds, 1992).

These early pre-verbal understandings of the physical environment subsequently serve as building blocks for the development of more abstract concepts. As mentioned previously, Fauconnier (1997) argued that features of abstract concepts are mapped onto specific perceptual features of concrete concepts, and through these mappings, higher-order concepts are constructed. Thus, without involving a person's explicit intent or

awareness, the mind uses perceptual, body-based information as the scaffolding for the development of abstract concepts. Throughout this increased symbolic development, processes underlying language capacity are linked to early sensory-motor experiences.

One rationale for utilizing priming manipulations with conceptual metaphors is that one is not priming single concepts, but rather conceptual structures. According to Lakoff and Johnson (1980, 1999), one of the first complex conceptual mental structures to develop are those that come out of our direct experience of orientation in space (up-down, forward-backward, inside-outside, etc.). Mandler (1992) suggested that language itself is scaffolded onto these preverbal image-schemas. Before children can understand the words "in" and "out" they must first be able to perceptually process those words' meanings via image-schemas (Piaget & Inhelder, 1969). This view is closely aligned with Herbert Clark's (1973) analysis of how children come to develop spatial language and concepts. For example, humans develop an understanding that "forward is good, backward is bad" because of the nature of the human body and its perceptual apparatus ("I'm looking ahead to the party," "I can see light at the end of the tunnel," "He looked back with regret"). Humans' sensory and perceptual apparatus (eyes, ears, nose) are oriented almost exclusively toward the front of the body, and motor movements occur more naturally when the body moves forward. From these constraints of the human body, the notion that forward is the positive direction naturally arises because that is the primary direction of information gathering in an uncertain environment (Clark, 1973). Thus, the impact of priming individuals with conceptual metaphors lies in its capacity to activate and evoke sensory-motor experiences that operate on a preconscious level.

Impact of Priming: Non-Linguistic and Linguistic Processing of Visual Stimuli

Non-linguistic processing. Landau et al.'s (2010a) meta-analysis noted that manipulating perceptions, sensations, and other sensory-motor states through embodied non-linguistic primes produces metaphor-consistent changes in how information is attended to, recalled, and interpreted. Without the use of linguistic processing, the mechanism of embodied primes exposes individuals to concrete sensory experiences, which nonconsciously influences subsequent judgments and behaviors. Similarly, Landau et al.'s (2010b) study demonstrated that metaphoric effects impacting self-disclosure and intimacy should be obtained even in contexts where the participant does not linguistically process the presented stimulus. The present study, based on Landau et al.'s (2010b) study, evaluated whether there is an impact on levels of self-disclosure and intimacy in an interpersonal encounter after participants are metaphorically primed with embodied non-linguistic primes. After participants viewed animated clips they then physically re-enacted the animation using similarly proportioned and colored 3-dimensional shapes. Relying on visual and motor sensory-motor processes by physically re-enacting a visual stimulus, O'Regan and Noë (2001) described that our visual system and our bodily movement and the feedback it generates are tightly integrated. By physically copying a visual stimulus, one is able to perform cognitive tasks, such as remembering, more effectively by using one's body and even parts of the surrounding environment to simplify the nature of cognitive processing (Donald, 1991). The motor system is automatically activated during conceptual or visual-perceptual processing.

One reason why animations are used so widely is that many people think it is easier for learners to form an internal representation of the dynamics of a system when

the can perceive these dynamics directly, rather than when they have to imagine or mentally infer the movements from static visualizations (Hegarty et al., 2003). Koning and Tabbers (2011) described that the involvement of human movement is key to understanding dynamic animations. They argued that learning from animations might be enhanced by involving the learner's own motor system. Their central claim is that applying an embodied perspective to the design of animations facilitate understanding of dynamic systems, irrespective of whether the movements depicted in the animation are human or not.

Current empirical evidence supports activation automatically spreading from conceptual or perceptual levels of processing to the motor system, without the use of linguistic processing. Shimada (2010) investigated whether sensory-motor areas showed similar activation patterns when participants viewed a human agent performing human actions, a human agent performing robotic actions, a robot agent performing human actions, and a robot agent performing robotic actions. His results showed that sensory-motor areas activated only when there was a congruency between the agent and the action performed, particularly when the agent was a human. This study lends support to the claim that visual input affects motor and conceptual processing. Similarly, Vingerhoets et al. (2009) presented subjects with images of unfamiliar tools that were highly or poorly graspable. The participants' task was to respond to an arrow pointing to the right or left (prime), which was presented along with the image of the objects (target). The objects' handles were oriented towards the right or left, consistent with an afforded right or left grasp, respectively. When the prime was pointing to the left, participants had to press a response button located on their left, and when it was pointing to the right, participants

had to press a response button located on their right. Researchers found that when the prime and the target shared the same direction, response times (RTs) were faster. The crucial finding, however, was that RTs were faster to highly graspable objects than to poorly graspable objects. These results suggest that objects' physical appearances (e.g. graspability) determine the motor behavior necessary to act upon them and that visual information is crucial in order to achieve this. Palermo et al. (2009) proposed a dynamic view where several types of motor and conceptual processing are simultaneously activated. However, it still remains an open question as to how they are prioritized during a real-time priming task.

Several studies have shown that manipulating learners' actions resulted in better text comprehension (e.g., Glenberg et al., 2008) and better problem solving (e.g., Thomas & Lleras, 2009). Even learning about concepts or actions that do not spontaneously evoke motor resonance is facilitated when the content can in some way be linked to people's own body. For example, in the study by Thomas and Lleras (2009), participants worked on Maier's classic string problem. This problem required participants to tie together two strings hanging from opposite sides of the room, with the aid of some seemingly irrelevant objects like a wrench and a paperback book. The strings were too short to just pick up one string and walk to the other string, so solving the problem required some type of strategy. The most efficient strategy was to attach an object to one of the strings and make it swing, then walk to the other string, catch the swinging string, and tie both strings together. During the problem-solving exercise, participants had several short exercise breaks. As an exercise, half of the participants made swinging movements with both arms, congruent with the movement of strings in the optimal solution strategy,

whereas the other half stretched both arms straight out, incongruent with the solution

strategy. After 16 min, 85% of the participants in the congruent movement condition had

solved the problem, compared to 62% of participants in the incongruent movement

condition. Because participants were not aware of the relationship between the exercises

and the problem solution, this suggests a link between the arm movements and problem-

solving success. Rapp and Kurby (2008) have suggested that the perceptual and motor

experiences during a visual task should be related to the animation's movements. This

sensorimotor information then becomes part of the mental simulation and together with

information stored in other modalities can be retrieved when necessary to form a

multimodal representation of the depicted movement (Koning & Tabbers, 2011).

It is becoming increasingly evident that enactment of actions leads to better

retrieval than just verbal description of these actions (e.g., Koriat & Pearlman-Avnion,

2003). One line of evidence for the benefits of active manipulation of instructional

materials comes from studies on language comprehension. Glenberg et al. (2004)

described an experiment where young children read a text about activities in a particular

scenario (e.g., a farm scenario) and manipulated real toys (e.g., animals, farmer, barn)

that were in front of them so they could portray the actions in the passage (e.g., the

farmer walked in the barn). Compared to reading alone (i.e., no toy manipulation),

children's manipulation of toy objects as directed by a narrative improved their story

recall, understanding of the spatial relationships, and these children were better at

drawing inferences from the story. In addition, after a brief training, similar findings were

obtained when children were instructed to imagine manipulating the toys. These findings

encourage the use of active manipulation of objects during instruction and suggest that

this is an effective way to enhance comprehension. Extending the findings of Glenberg et al. (2004), Marley et al. (2007) demonstrated that even when learners observe another person manipulating toys to represent text content, comprehension is improved compared to only reading the text.

Given the causal link between action and cognition, there may be good reason to expect that learning from animations could be facilitated by relating the movements and events to people's own actions. In the current study, the animation task should encourage sensory activities that help participants understand movement depicted in the animation. By allowing participants to reconstruct the movement they just saw, learners are actively processing the information, which contributes to the construction of a mental model of the dynamic system (Koning & Tabbers, 2011). Moreover, reconstructing the movement requires a great deal of retrieval effort, which can aid in boosting memory of the initial presentation (Roediger & Karpicke, 2006).

Linguistic processing of visual stimuli. In addition, the current study addressed how embodied linguistic metaphorical primes relate to understanding and framing an abstract visual stimulus. The present study examined whether there are differences between groups that are primed solely with non-linguistic metaphors versus the participant primed with linguistic metaphors. Previous research on the effects of metaphors has not distinguished the differential effectiveness of the medium of expression in establishing intimate connections.

Recent research has investigated the activation and interaction between language and vision both at the representational and behavioral level (Altmann & Kamide, 2009; Ferreira & Henderson, 2004; Mishra, 2009). For example, Zwaan et al. (2004)

demonstrated that readers mentally simulate a motion described in language. Participants

listened to a sentence suggesting a motion toward or away from the participant (e.g.,

"The pitcher hurled the softball to you" or "You hurled the softball at the shortstop"),

followed by two consecutively presented pictures of the described object (e.g., the

baseball). The second picture was either smaller or larger than the first picture, thus

suggesting movement toward or away from the participant. Judgments about whether the

two pictures were the same size were made faster when the implied movements of the

pictures matched to that of the implied movement described in the sentence. These

results, together with other studies, suggest that the mental representation responsible for

our comprehension of motion sentences likely involves perceptual simulation of the

described events (Stanfield & Zwaan, 2001; Zwaan et al., 2002). These experiments

highlight the notion that action in the world is strongly guided by previous experience

and that the knowledge acquired linguistically is related to sensory-motor interactions

with the environment and visual recognition. Similarly, Glenberg and Kaschak (2002)

presented participants with the sentences: "Close the drawer" or "Open the drawer." The

authors found that the meaning of the sentence interacted with the type of movements

that participants made for their responses. For example, when presented with the sentence

"Close the drawer," subjects were slower to make a response involving a movement

toward the body than they were to make a movement away from the body. These findings

indicate that the linguistic analysis of the sentence involves motor simulation of the

corresponding actions. Thus, when participants must make a motor response, the motor

system is already engaged in linguistic analysis.

Equivalent findings are observed when the semantic analysis of the sentence does not involve motor-relevant information, but rather a particular perceptual experience. For instance, Zwaan et al. (2002) presented participants with the following sentences: (1) "The ranger saw an eagle in the sky" and (2) "The ranger saw an eagle in the tree." The authors found that participants were faster to respond to a picture of an eagle with its wings outstretched after sentence (1) after sentence (2). There is also additional evidence for the interaction of vision with linguistic cognitive processes. For example, ascribing linguistic meaning to an otherwise arbitrary visual stimulus facilitates performance in visual categorization (Goldstone et al., 2001) and in visual search tasks. In Lupyan and Spivey's (2008) experiment, some participants were explicitly instructed to apply a meaningful linguistic label to a novel visual stimulus in a search task. As a result, participants who used that label performed the search faster and more efficiently. These data suggest that there is a conceptual influence on visual perception, such that seeing depends not only on what something looks like but also on what it means. Thus, it appears that sensory-motor and visual representations are at work while integrating linguistic cues.

Social cognitive theory has traditionally relied on the assumption that concepts are mentally represented in terms of linguistic content (Glucksberg & Keysar, 1990). Collins and Loftus (1975) stated that one dimension in which the human semantic network is organized in terms of conceptual similarity. A concept that share features with another concept will have many strong associative links between them. McRae and Boisvert (1998) demonstrated through a lexical-decision priming task that there is increased speed in identifying similar conceptual categories, e.g., like and a target

concept (i.e. love). These results are compatible with Ratcliff and McKoon's (1988) theory of priming. They proposed that conceptual memory is accessed by familiarity of information, which is encoded linguistically and available in long-term memory.

Psycholinguistic research has shown that linguistically framing a target concept using metaphoric expressions related to one source concept facilitates comprehension and memory for expressions consistent with that metaphor (Galinksy & Glucksberg, 2000). Gildea and Glucksberg (1983) found that a metaphor like "Some smiles are razors" is easier to understand when it is preceded by a related prime that was related, such as "Some tools are cutting," than when preceded by an unrelated prime. Gibbs, Bogdanovich, Sykes, and Barr (1997) examine whether people's use of conceptual metaphors such as, "anger is heated fluid in a container" affect immediate comprehension of phrases like: "blow your stack," "flip your lid," "hit the ceiling," "get hot under the collar," or "lose your cool." Their findings demonstrated that conceptual metaphors can be quickly accessed, however the contextual conditions facilitating or inhibiting metaphorical thinking and linguistic processing of visual primes remains unknown. This was further explored in the current study by examining participant's unique understanding and processing of the visual stimulus through a linguistic semantic differential task.

Finally, the literature review will now concentrate not only on how contextual factors such as primes impact intimacy in a relationship, but on examining how attachment style may influence interest in and behavior towards intimacy and self-disclosure in relationships.

Intimacy and Self-Disclosure in Relationships

Operational definition of intimacy. Although opinions differ on a definition of

intimacy, many theorists agree on the features that constitute an intimate interaction such

as the presence of love and affection (Berscheid, 1985), development of trust and

assurance of confidentiality (Hatfield & Rapson, 1993), as well as the ability to disclose

parts of oneself (Wheeless, 1976). The current study will focus on the degree of self-

disclosure and perceived levels of intimacy between participants and a confederate.

Perhaps because of the widely held interest in the constructs of intimacy and self-

disclosure, they have been defined in a variety of ways—sometimes as a property of

individuals and other times as a property of relationships (Reis & Shaver, 1988). Older

conceptualizations defined intimacy as the willingness to disclose information about

private topics to another person (Altman & Taylor, 1987). Early psychodynamic models

defined intimacy as involving two people who self-disclose, express, and validate each

other's worldviews (Sullivan, 1953). Many definitions suggest that intimacy is a feeling

of closeness that develops from personal disclosures between people (Perlman & Fehr,

1987).

Since these early conceptualizations, the operational definition of intimacy has been

refined so that it encompasses a broader set of processes (Clark & Reis, 1988). For

example, Reis and Shaver's (1988) conceptualization and definition of intimacy has been

labeled the interpersonal process model of intimacy. Intimacy is defined as a process in

which one person expresses important self-relevant feelings and information to another

and, as a result of the other's response, comes to feel understood and validated.

According to Reis and Shaver (1988), and expanded on by Reis and Patrick (1996),

intimacy results from a process that is initiated when one person (the speaker)

communicates personally relevant and revealing information to another person (the listener). The speaker discloses factual information, thoughts, or feelings and may further communicate emotions through nonverbal behaviors (e.g., gaze, touch, body orientation) (Patterson, 1984). As the intimacy process continues, the listener must respond to the speaker by disclosing personally relevant information, expressing emotion, and emitting various behaviors. For the speaker to interpret the listener's communication as responsive, the listener must convey that he or she understands the content of the speaker's disclosure, accepts or validates the speaker, and feels positively toward the speaker. At each stage of this process, personal qualities and individual differences, including motives, needs, and goals, can influence each person's behaviors and their interpretation of a partner's behavior (Reis & Patrick, 1996). In this transactional view, intimacy develops through a dynamic process.

Operational definition of self-disclosure. The phrase "self-disclosure" was introduced into the psychological literature by the work of Jourard (Jourard, 1968; Jourard & Lakasow, 1958). For Jourard, a humanistic psychologist and practicing psychotherapist, self-disclosure was "the process of making the self known to others" (Jourard & Lakasow, 1958, p. 91). His message was that in appropriate circumstances it was healthier to reveal feelings, and other personal matters, than to suppress them. Disclosing oneself was a positive and desirable thing to do. Jourard and colleagues sparked an empirical interest in charting the causes and effects of self-disclosure. Research on self-disclosure has found that the ability to reveal one's feelings and thoughts to another is a basic skill for developing mutual understanding and intimate relationships (Altman & Taylor, 1973; Berscheid & Walster, 1974), while the lack of

self-disclosure has often been related to dissatisfaction with one's social network and feelings of loneliness (Stokes, 1987). Researchers have also distinguished between factual (i.e., descriptive) and emotional disclosure when examining the impact of disclosing in intimate relationships (Morton, 1978; Reis & Shaver, 1988). Factual self-disclosures are those that reveal personal facts and information (e.g., "I was born in Boston, Massachusetts"). Emotional self-disclosures are those that reveal one's private feelings, opinions, and judgments (e.g., "One of my biggest fears is that no one loves me"). Although both types of disclosures reveal private aspects of the self to others, disclosures involving emotions and feelings lie most closely at the core of one's self-definition (Greenberg & Safran, 1987; Reis & Patrick, 1996). Self-disclosures that involve emotions are believed to generate greater intimacy than those that are merely factual because such disclosures open the way for the listener to support and confirm core aspects of the discloser's view of self (Reis & Shaver, 1988; Sullivan, 1953).

Interpersonal process: Self-disclosure and intimacy. Specific empirical support for the conceptualization of intimacy as the outcome of an interpersonal process is only beginning to emerge (Laurenceau et al., 2004, 2005; Manne et al., 2004). In an unpublished experience sampling study using college students (Lin, 1992, as cited in Reis & Patrick, 1996), participants completed a diary of all their social interactions that were at least 10 min long over a 10-day period. Average ratings of self-disclosure and partner responsiveness predicted levels of overall perceived relationship intimacy. Moreover, partner responsiveness was a more important predictor of intimacy ratings than was self-disclosure. More recent evidence comes from two experience sampling studies, in which university participants provided ratings of self-disclosure, perceived partner disclosure,

perceived partner responsiveness, and feelings of intimacy immediately after social interactions over a 1-week or 2 weeks (Laurenceau, Feldman Barrett, & Pietromonaco, 1998, Study 1). Participants reported on a range of interpersonal interactions and social relationships. Both self-disclosure and partner disclosure were significant predictors of intimacy on an interaction-by-interaction basis. Perceived partner responsiveness emerged as a partial mediator of these processes. These findings suggest that effects of disclosures on feelings of intimacy depend, in part, on the perceptions and evaluations of a partner's response. The results also indicate that self-disclosure of emotion was a more important predictor of intimacy than was self-disclosure of facts and information. Consistent with these findings, Lippert and Prager (2001) asked a sample of romantic, cohabiting couples to complete interaction diaries assessing intimacy, disclosure of private information, expression of emotion, and perceptions of being understood by one's partner. Ratings of intimacy on an interaction-by-interaction basis were significantly predicted by both disclosures and perceptions of partner understanding. Similarly, Laurenceau et al. (2005) assessed components of the intimacy process using a daily-diary method whereby spouses independently completed a structured diary each evening over a period of 42 days. Husbands and wives completed measures of global marital satisfaction, overall relationship intimacy, and demand-withdraw communication. Both self-disclosure and partner disclosure significantly predicted ratings of intimacy for husbands and wives on a day-to-day basis.

A major limitation of these past investigations is that data was collected through self-reported diary recordings between known couples. The current study will attempt to capture the degree of perceived self disclosure (i.e., "How much did you disclose

thoughts to your partner?"), partner disclosure (i.e. "How much did your partner disclose thoughts and feelings?"), perceived responsiveness (i.e., "How would you rate how your partner responded to what you shared?"), and degree of intimacy (i.e., "How close did you feel to your partner during this discussion?") experienced in an interaction between a research participant and a trained confederate. This study contributes to the literature by examining performance data through confederate ratings of the participant's level of self-disclosure and intimacy in a relationship induction task (Sedikides et al., 1998).

How Attachment Style Influences Intimacy & Self-Disclosure With New Peers

Attachment theory is a framework that has been used to examine individual differences in self-disclosure and intimacy in relationships (Grabill & Kerns, 2000; Mikulincer & Nachson, 1991; Pistole, 1993). Attachment is defined as a deep, emotional tie that one individual forms with another (Bowlby, 1982). Optimally, attachment figures provide comfort, a safe haven, and support in stressful or fear-arousing situations (Holmes, 2001; Mikulincer & Shaver, 2005), thus instilling a feeling of security and intimacy with another (Collins, Guihard, Ford, & Feeney, 2004). From an attachment perspective, intimacy involves the capacity for autonomy, individuality, and separateness within the relationship (Shulman, Laursen, Kalman, & Karpovsky, 1997). Cassidy (2001) discussed the crucial abilities necessary for developing the capacity for intimacy: the ability to seek care, to give care, and to feel comfortable with an autonomous self. In each of these realms, individuals having secure attachments will likely enjoy an advantage in forming and maintaining close, trusting, and intimate relationships (Furman, Simon, Shaffer, & Bouchey, 2002).

During late adolescence and emerging adulthood adolescents are expected to

expand their relationship networks (Collins, Gleason, & Sesma, 1997) and further develop their capacity for mature intimacy with friends and romantic partners. Arseth et al. (2009) described that both attachment and intimacy have in common "styles of relating" to others. Attachment theory describes representations of relationships; whereas intimacy describes the capacity for relatedness. However, attachment style and intimacy are mutually determined and reciprocally enhancing (Marcia, 2006).

Mikulincer and Nachson's (1991) work on self-disclosure, intimacy, and attachment style, reported that secure individuals feel more comfortable and are more likely to reciprocate highly intimate disclosure than insecure individuals. The attachment literature suggests that secure persons expect others to be responsive and attuned to one's needs in stressful situations (Hazan & Shaver, 1987; Main et al., 1985). These positive expectations lead to the conviction that relationships are rewarding and thereby foster the desire to become intimate and disclose information with another (Berg, 1987). Individuals classified with an avoidant style suffer from a lack of security in attachment figures (Bowlby, 1982; Shaver & Hazan, 1988) and deal with interpersonal distress by maintaining distance from others. Mikulincer and Nachson (1991) demonstrated that these individuals were unwilling to reveal aspects of themselves and lacked responsiveness to their partner's disclosure. Individuals classified with an ambivalent attachment style shift from a desire for seeking connection and merging with others (Bowlby, 1982; Shaver & Hazan, 1988) to resisting contact and demonstrating concern of becoming too close to another (Collins & Read, 1990). Mikulincer and Nachson (1991) reported that people classified with an ambivalent attachment style disclosed more information and felt better interacting with and were more attracted to a high discloser

partner than a low disclosing partner.

In a review of adolescents' attachment representations and their capacity for intimacy in close relationships, Mayseless and Scharf (2007) found that attachment classifications longitudinally predicted the capacity for intimacy (Scharf, Mayseless, & Kivenson-Baron, 2004) and feelings of intimacy but did not predict other aspects of the couple's relationships such as commitment, satisfaction, and passion (Cohn et al., 1992; Crowell, Treboux, & Waters, 2002). In addition, a secure attachment style was associated with reports of higher self-disclosure (e.g., Mayseless, 1993), responsiveness to partner's disclosure, and feeling validated and understood in the friendship. As for romantic relationships, a large number of studies with samples of late adolescents or young adults (Feeney, 1999; Shaver & Mikulincer, 2002) have consistently found that secure individuals had more trusting attitudes and higher levels of satisfaction and intimacy in their romantic relationships, as reported by them and by their partners through questionnaires and interviews (e.g., Mikulincer & Erev, 1991). Ambivalent individuals, on the other hand, expressed the highest degrees of dependence, jealousy, and obsessive preoccupation with the love partner, and the lowest levels of satisfaction in their romantic relationships (e.g., Collins & Read, 1994; Mayseless, Sharabany, & Sagi, 1997). Finally, avoidant individuals evinced more mistrust and less intimacy in romantic relationships. Altogether, these studies demonstrated that secure attachment is associated, as expected, with intimacy in the relationship.

One of the core propositions of adult attachment theory is that the way individuals learn to manage stress in earlier relationships systematically affects the interactions in new relationships (Rholes & Simpson, 2004). Attachment theory posits that experiences

in close relationships, particularly with caregivers during childhood, as well as the attachment representations or "internal working models" may affect the capacity to later form intimate relationships with new peers (Bowlby, 1977; Kobak & Sceery, 1988). When individuals meet and converse with new acquaintances it is natural to make quick, intuitive judgments about the stranger and subsequently act based on those beliefs. These judgments allow one to maintain a sense of predictability, reduce uncertainty and ambiguity, while exerting control over the situation (Kelley, 1972). The idea that attachment representations are generalized to new social situations and guide behavior with unfamiliar others is central to attachment theory. However, research regarding this important theoretical postulate has been lacking in adolescence and adulthood, as most research has focused on establishing the influence of attachment representations on close relational dynamics. Thus, one goal of this investigation was to examine the extent to which attachment representations are predictive of late adolescents' and emerging adults' interest in and behavior towards intimacy in a relationship with a new peer.

There are two studies that come close to considering this issue of examining adult attachment styles in encounters with new peers. Roisman (2006) demonstrated that links between adults' states of mind regarding childhood attachment experiences and the quality of their interpersonal interactions are evident in first meetings between same-sex strangers in a non-attachment-related context. More specifically, in a study of 50 stranger dyads (50% female, 50% male), secure adults as measured by the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) demonstrated positive emotional engagement during a challenging puzzle-building task. In contrast, preoccupied adults dominated the task, whereas dismissing adults evidenced negative emotion during the

interaction. However, this was a structured non-attachment-related situation focused on a puzzle task, and not on meeting and getting acquainted with a stranger. In a second study conducted by Feeney et al. (2008), undergraduate Israeli students reported their willingness to self-disclose to others. Participants spoke to a confederate who exhibited experimentally manipulated levels of self-disclosure. Results indicated that secure and anxious–ambivalent participants, but not avoidant participants, reciprocated disclosure and reported liking toward a high-disclosing confederate. However, this was an activity that did not involve naturalistic interaction because the participant was instructed to speak for two minutes after hearing a confederate speak for two minutes. Without limiting or highly restricting the relational encounter, the current study involved research participants in a naturalistic interaction with a confederate. The confederate and research participant alternated asking and answering questions on a variety of intimate questions based on a relationship task developed by Sedikidies et al. (1998). Both participants subsequently assessed dimensions of the depth and breadth of intimacy and self-disclosure in the interaction.

Attachment theorists have drawn attention to the link between enduring and stable attachment and communication patterns that consistently impact interpersonal encounters across time, situations, and behavioral content (Noftle & Gillath, 2009). Conversely, the social cognitive perspective argues for inconsistency, proposing that one's momentary thoughts, feelings, unaware thoughts and feelings, and interpretations of events have a fundamental influence on behavior with another. Previous social cognitive studies on metaphorical priming have not addressed how attachment style may affect behavior towards intimacy in a new relationship. The present study examined the interaction of

metaphorical primes and attachment style on intimacy.

Social-cognitive perspective. After years of research into the correlates of attachment style, recently more attention has been given to the social-cognitive literature of attachment processes. This social-cognitive research suggests that adult attachment styles are not stable dispositions that define people's orientations in all their relationships. Baldwin et al. (1996) suggested that people report multiple ways of relating to others emphasizing the variability in relationship-specific attachment orientations. Examining the social-cognitive processes mediating differences in specific relationships, they hypothesized that priming people with certain kinds of attachment configurations would influence the way individuals perceive and respond to subsequent interpersonal encounters. They found that simply visualizing a particular attachment relationship for a few moments served to prime people with that way of relating, leading them to later respond to interpersonal information in a similar way. This study provides evidence that the mental modes underlying attachment style function similar to other forms of priming and social-cognitive structures. The more articulated and available a given schema is in one's memory, the more accessible it is for potential use in processing and interpreting a new interaction. Attachment research can benefit by applying lessons of situational and contextual factors to get a better sense of how and why attachment fluctuates in everyday life (Gillath, Selcuk, & Shaver, 2008). Although priming attachment configurations is beyond the scope of this study, this project examined the extent to which contextual priming manipulations impact interpersonal behavior and is potentially moderated by self-reported attachment style.

Chapter III

Statement of the Problem

Metaphors are not merely ornate figures of speech but rather provide a window into people's underlying conceptions of the social world. Lakoff and Johnson (1980, 1999) suggested that metaphors are cognitive tools that people use to understand abstract concepts in terms of dissimilar concrete concepts that are relatively easier to grasp. A great deal of social cognitive theory and research has demonstrated that metaphors help us organize abstract concepts related to our social experiences (Gibbs, 1994).

Researchers, however, are only beginning to look at the possibility that metaphors not only structure our thoughts and behavior, but also act as an organizing framework for intersubjective exchange and may establish intimacy between people. Cooper (1986) argued that feelings of intimacy could be created through the mutual understanding of particular metaphoric expressions. When individuals identify the same similarities between different conceptual domains, they establish the basis for coming closer together and connecting.

Landau et al. (2010b) studied how metaphors can induce connections with others (versus protection) by priming interest in intimacy. Landau et al. proposed that people often describe an unwillingness to disclose aspects of themselves to others because of perceived external threats. In his studies individuals were exposed to a sequential visual animation depicting a sphere being protected from intruders by a surrounding layer. Landau et al. found that participants primed with the "protection" animation chose to answer fewer intimate questions as compared to participants in the control condition. However, this study was limited by only evaluating interest, not actual intimate behavior

in a relational encounter after the metaphorical visual prime. The current research study addressed that gap by evaluating both interest and actual, self-disclosure and intimacy with others in a relationship induction task (Sedikides et al., 1998). The current study examined participant's unique characteristics of thinking metaphorically after viewing animated clips of interacting shapes in a visual prime and how this visual prime might impact their level of self-disclosure and perceived intimacy in an unrelated relationship task with a confederate. Not relying solely on participant self-report ratings of the relational interaction, this study also contributed to the literature by examining performance data through confederate ratings of the participant's level of self-disclosure and intimacy (Huprich, Bornstein, & Schmitt, 2011).

Furthermore, previous research on metaphors had not distinguished the differential effectiveness of the medium of expression in establishing intimate connections. It is unclear whether it is most effective to alter willingness to disclose intimate information by metaphorically priming individuals solely with non-linguistic embodied primes versus linguistically framing the presented visual stimulus. Social cognitive theory has traditionally relied on the assumption that concepts are mentally represented in terms of linguistic content (Glucksberg & Keysar, 1990). In contrast, Landau et al. (2010b) used solely a visual presentation to elicit metaphors that influenced interest in intimacy towards another. There has not been a direct comparison of how embodied primes compare with the linguistic understanding and framing a visual prime. The present study addressed this discrepancy.

Finally, the current study examined the interaction of metaphoric processing of animated visual primes and attachment style. Landau et al. (2010b) used a personality

inventory along with metaphorical primes; however, the personality inventory was used as a dependent variable to examine whether the visual prime impacted participant ratings of self-esteem. The present study examined the interaction of metaphoric primes and attachment styles on interest and behavior towards intimacy and self-disclosure with others.

The current study aimed to address the following research questions:

1. To what extent does thinking metaphorically after being primed influence perceived intimacy and level of self-disclosure in an unrelated interpersonal encounter?

2. Are metaphoric primes more effective solely as an embodied expression or through linguistically understanding and framing a visual stimulus?

3. To what extent is there an interaction between metaphorical primes and attachment style on intimacy and self-disclosure?

Variable List

Independent variables.

This study was a one-way between groups experimental design. The independent variable was means of presentation of the prime, with three levels: (1) a linguistic understanding of the visual prime, (2) non-linguistic embodied prime, and (3) control group.

1. Linguistic Prime. Based on the Castelli, Frith, Happe and Frith (2002) methodology, a short visual animation entitled "Coaxing" depicting two interacting triangles was presented followed by a semantic differential

processing task (a scale used for measuring the connotative meaning of concepts apart from its explicit meaning).

2. Non-linguistic Embodied Prime. Using the same "Coaxing" animation from Castelli et al. (2002), participants physically re-enacted the animation (after viewing the video) using similar proportioned and colored 3-dimensional triangles.

3. Control Group. Using a control group animation video entitled "Drifting" (depicting random movement of triangles) from Castelli et al. (2002), participants physically re-enacted the animation (after viewing the video) using similarly proportioned and colored 3-dimensional triangles.

Exploratory variables.

1. Attachment Style as measured by the Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996). Factor analysis of this scale reveals two dimensions--Ambivalence (individuals' negative self-views regarding relationships) and Avoidance (assesses negative views of others). Higher scores on the Ambivalence and Avoidance scale indicate higher levels of Ambivalence or Avoidance in relationships. Low overall scores on the AAQ indicate secure attachment orientation, as the respondent is not indicating high levels of ambivalence or avoidance. The Ambivalent and Avoidant scales will be utilized as a continuum rather than assigning participants to an attachment category or classification.

Dependent variables.

1. Perceived Intimacy and Self-Disclosure. Following Landau et al.'s (2010b)

   study, both participant and confederate filled out a short questionnaire

   assessing scales in the "Getting-to-Know-You" Relationship Induction Task

   (Sedikides et al., 1999). The participant provided self-report ratings, while the

   confederate assessed the participant's behavior towards intimacy and self-

   disclosure in the relationship task. The questions were based on a 7-point

   scale ranging from 1 to 7. The scores from the participant and the confederate

   will be combined for a total score for the following five intimacy and self-

   disclosure scales. The five scales assess: how well they feel they know the

   other person, likelihood of future friendship, felt closeness and intimacy,

   degree of self-disclosure (participant and confederate), and degree of

   responsiveness.

Hypotheses

Hypothesis 1. It was expected that there would be significant differences in the measure of intimacy and self-disclosure across the three experimental conditions, such that the two experimental conditions (Linguistic and Non-Linguistic Embodied groups) would have significantly higher intimacy and self-disclosure scores than the control group.

Hypothesis 1a. As part of an exploratory hypothesis to the first hypothesis, there would be a difference in intimacy and self-disclosure scores between the Linguistic and Non-Linguistic Embodied groups.

Hypothesis 1b. As part of an exploratory hypothesis to the first hypothesis, there would be a difference between participant self-disclosure of factual information versus emotional disclosures across the three conditions, such that the two experimental conditions (Linguistic and Non-Linguistic Embodied groups) would have significantly higher emotional disclosures than factual disclosure scores than the control group.

Hypothesis 2. It is expected that there were significant positive correlations between attachment style and the intimacy and self-disclosure scores.

Hypothesis 2a. As part of an exploratory hypothesis, the relative effects of attachment style on each of the experimental conditions would be examined in the results: if attachment style has no effect on intimacy and self-disclosure, then it would be expected that there would be differences in intimacy and self-disclosure scores between the control group and the two experimental conditions. Also, if attachment style had no effect on intimacy and self-disclosure, then it would be expected that there would be a difference in intimacy and self-disclosure scores between the linguistic understanding and the non-linguistic embodied groups.

Chapter IV

Method

Participants

A total of 90 participants participated in the study. The participants were recruited from the Long Island University (LIU) Brooklyn Campus population, which is comprised mostly of students. LIU is made up of a culturally and ethnically diverse urban student body (42% African American, 17% Caucasian, 15% Multi-Ethnic, 14% Latino/a, and 11% Asian). Participants for the current study were at least 18 years old in order to provide informed consent. Participants were required to be fluent in English in order to communicate in the "getting-to-know you" relationship task as well as to complete questionnaires and forms.

Measures

Independent variables.

Linguistic prime. The "Coaxing" video, developed in Uta Frith's experimental lab, of two interacting triangles was presented as a visual prime (Castelli et al., 2002) (Appendix C). The silent animation lasted approximately 40 seconds and was shown to participants twice on a 13" Macintosh Macbook Pro screen. The animation features a big red triangle and a small blue triangle interacting on a framed white background. The animation elicits a pervasive tendency to attribute mental states even to simple shapes in motion (Castelli et al., 2002). The video has been utilized extensively with individuals with autism (Abell et al., 2000; Bowler and Thommen, 2000; Castelli et al., 2002; White et al., 2011; Zwickel et al, 2010). Following the animation, participants in the linguistic condition completed a semantic differential scale used for measuring the connotative meaning of concepts apart from its explicit meaning (Appendix E). The semantic

differential scale consists of nine bipolar adjectives (i.e. Passive & Active) spaced on a seven-point scale, which represent the three common factors: Evaluative, Potency, and Activity (EPA) (previously identified by Osgood, Suci, and Tannenbaum, 1957). The respondent was asked to rate their reaction to a concept by putting a mark on one of the 7 spaces. Bipolar adjective scales are a simple means for obtaining data on people's subjective reactions to a concept.

Non-linguistic embodied prime. Using the same "Coaxing" animation from Castelli et al. (2002), participants physically re-enacted the animation after viewing the video twice using similarly proportioned and colored 3-dimensional triangles (Appendix C). The participants attempted to physically re-enact the video on an 18" x 24" board scaled to the same size as the video. Participants and the investigator rated the participant's accuracy in replicating the animation on a Likert-scale ranging from 1 (Not accurate at all) to 7 (Extremely Accurate) and time spent replicating the animation.

Control group. The random animation clip "Drifting," developed in Uta Frith's experimental lab (Castelli et al., 2002), was used as a visual prime for the control group (Appendix C). The animation displays an apparent random movement of a large red triangle and a smaller blue triangle constantly passing by each other without interacting in a meaningful way. During the viewing, participants watched the 40-second sequence twice. Similar to the Non-Linguistic Embodied condition, participants physically re-enacted the video on an 18" x 24" board using similarly proportioned and colored 3-dimensional triangles. Participants and the investigator rated the participant's accuracy in replicating the animation on a Likert-scale ranging from 1 (*Not accurate at all*) to 7 (*Extremely Accurate*) and time spent replicating the animation.

Pilot data. The "Coaxing" and "Drifting" animations were part of a pilot project with 46 LIU undergraduate students (20 participants in the Linguistic condition, 16 participants in the Non-linguistic Embodied Prime condition, and 10 Control group participants). The goal of the pilot project was to determine which animated clip would have the greatest impact on inducing participants to self-disclose information as well as assessing potential challenges to re-enacting the video with shapes in the Non-Linguistic Embodied Condition. In all three conditions, after viewing the clip, participants rated on a 5-point Likert scale, ranging from *"Strongly Disagree"* to *"Strongly Agree,"* whether the animated clip (or embodied replication task) put them in the mood to share personal information. After this rating, participants described their impression of the clip. Three different animated clips were selected: two from Uta Frith's developmental lab (entitled "Coaxing" and "Seducing") (Castelli et al., 2002) and one from Barbara Tversky's lab (entitled: "The Chase") (Hard, Tversky, & Lang, 2006).

An independent-samples *t*-test was conducted to compare the participant's self-report ratings of self-disclosure after watching the "Coaxing" and "Seducing" clips from Frith's lab in the Linguistic condition. There was a significant difference in the scores, *t* (12) = 2.52; *p* = .027, for the "Coaxing" clip (*M* = 4.00, *SD* = 0.58) and "Seducing" clip (*M* = 3.14, *SD* = 0.69). These results suggested that the "Coaxing" clip has an effect on inducing self-disclosure with a stranger. A qualitative rating demonstrated that participants watching the "Coaxing" clip seemed to come up with a variety of meanings (including fighting, dancing, resolving conflicts, and themes of separation and individuation) compared to the "Seducing" clip. The participants described a variety of ways in which the shapes related to each other including: friends, parent-child, and

spouses as well as personally relating to aspects of the shapes' perceived experience in the clip. There was not a significant difference, t (11) = 1.27, p = 0.23, for the "Coaxing" clip (M = 4.00, SD = 0.58) and "Chase" clip (M = 3.50, SD = 0.84).

In the Non-linguistic Embodied condition, a one-way between subjects ANOVA was conducted to compare the effect of whether the induction task would lead to self-disclosure with another in the "Coaxing," "Seducing," and "Chase" conditions. There was no a significant effect of the induction in self-disclosure for the three conditions [F (2,13) = 1.63, p = .234]. These results suggest that physically re-enacting the clip did not have an effect on self-disclosure with another. However, the "Coaxing" (M = 3.40) and "Seducing" (M = 3.40) re-enactments had an overall higher mean of self-disclosure than the "Chase" re-enactment (M = 3.00).

A pilot project was also conducted to determine which control video would demonstrate the greatest impact on self-disclosure. Two different control (or random) videos were selected: two from Uta Frith's developmental lab (entitled "Drifting" and "Tennis") (Castelli et al., 2002). An independent-samples t-test was conducted to compare the participant's self-report rating of self-disclosure after watching the "Drifting" and "Tennis" video in the Control group. There was a significant difference in the scores, t (8) = 2.53, p = .035, for the "Drifting" video (M = 2.40, SD = 0.55) and "Tennis" video (M = 3.20, SD = 0.45). These results suggest that the "Tennis" video has an effect on inducing self-disclosure with a stranger when compared to the "Drifting" video. Therefore, the "Drifting" video will be selected for the Control group prime.

Dependent variables.

Perceived intimacy and self-disclosure. Through a semi-structured "getting-to-know-you" relationship task, the research participant and a confederate took turns self-disclosing on a variety of personal questions (i.e., "Where are you from?" "What made you come to LIU?," "If you could change one thing about yourself, what would that be?" "What is your happiest early childhood memory?" "Describe the last time you felt lonely") (Sedikides et al., 1999) (Appendix H). The confederate had a rehearsed script for answering questions in the task in order to standardize responses (Appendix I). After the "getting-to-know-you task," both participant and confederate filled-out a short questionnaire assessing self-disclosure and intimacy scales (Sedikides et al., 1999) (Appendix J). The participant provided self-report ratings, while the confederate assessed the participant's behavior towards self-disclosure and intimacy in the getting-to-know-you task. The scores from the participant and the confederate were combined for a total score for the following five intimacy and self-disclosure scales. The questions were based on a 7-point scale ranging from 1 to 7 and assessed the following five scales assess: how well they feel they know the other person (*"Not at All"* to *"Extremely Well"*), likelihood of future friendship (*"Low Likelihood"* to *"High Likelihood"*), felt closeness and overall intimacy (*"Not Close or Intimate at All"* to *"Extremely Close or Intimate"*), degree of self-disclosure (*"Disclosed Little"* to *Disclosed A Lot"*), degree of Responsiveness (*"Not Responsive at All"* to *"Extremely Responsive"*).

Exploratory Variables.

Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996). The AAQ scale is a well-established 17-item, 7-point Likert scale, which asks

participants to respond to statements about their feelings toward close relationships (Appendix L). Factor analysis of this scale reveals two dimensions--ambivalence and avoidance. The nine-item Ambivalent subscale reflects the extent of individuals' negative self-views regarding relationships, and preoccupation with abandonment loss, or partner's commitment level. Scores on this nine-item index range from 9 to 63. Mean scores for men and women were 30.20 and 30.10, respectively. Internal consistency of the ambivalence dimension is .72 for males and .76 for females, as measured by Cronbach's alpha (Simpson, Rholes, & Phillips, 1996). Sample items for this scale include: "I'm confident others would never hurt me by suddenly ending our relationship" and "The thought of being left by others rarely enters my mind." The eight-item Avoidant subscale is used to assess negative views of others. People with high avoidance scores have a more negative view of others than of themselves. Sample items for this scale include "I find it difficult to trust others completely" and "I'm nervous whenever anyone gets too close to me." The avoidant scale has coefficient alphas of .70 for males and .74 for females (Simpson et al., 1996). Scores on this eight-item index could range from 8 to 56. Mean scores for men and women were 26.90 and 26.30, respectively. Low overall scores on the AAQ indicate secure attachment orientation, as the respondent is not indicating high levels of ambivalence or avoidance.

Procedure

Participants were recruited in one of two ways: via the online Psychology Experience Credits (PEC) program and flyers posted around campus (Appendix A). The Department of Psychology's PEC program requires that all students enrolled in Introductory Psychology courses earn a minimum of four PECs. PECs are allocated in

half-hour increments. Since the project had been piloted to take approximately 45 minutes to an hour, participation in the current study earned the student 1.0 credit. Subjects were recruited through the use of the SONA system, an online system for coordinating studies in the Psychology Department. Interested students received an email confirmation if they met eligibility criteria and were then assigned a one-hour time slot to meet at the Psychological Center or in the Departmental Lounge on the 8th floor of the psychology department with the investigator. Subjects were also recruited through the use of flyers on campus bulletin boards. Participants made contact with the student researcher to establish their eligibility through an email address that was developed for the study. These subjects received receive a $15 gift certificate to Amazon for their participation in the study.

After participants met at the designated time and place the investigator went through the consent form with the participant (Appendix B). If they agreed to participate and had no further questions they were randomly assigned through a randomization program to one of three conditions: (1) a linguistic condition, (2) non-linguistic embodied prime, and (3) control group.

Participants in all three groups first took part in the visual priming task. Participants will be seated in front of a 13" Macintosh Macbook Pro. Once seated, participants viewed the short animation twice. Depending on the randomization assignments, participants in the Linguistic condition then provided written responses of their unique understanding of the "Coaxing" animation through a semantic differential questionnaire as well as answering two multiple choice questions that assessed their unique meaning of the presented stimulus (Appendix D). Participants randomized to the

Non-Linguistic Embodied Condition physically re-enacted the "Coaxing" animation, while participants randomized to the Control group physically re-enacted the "Drifting" animation. The only difference between the Non-Linguistic Condition and the Control group was the presented video animation. In both conditions, participants used similarly proportioned and colored 3-dimensional triangles as displayed in the video clip and physically re-enacted the video on an 18" x 24" board.

Following the visual priming task, participants were led next door to engage in the "getting-to-know-you" induction task (Sedikides et al., 1999) with a trained confederate. The confederate was waiting in an adjacent room reading a book. The investigator thanked the confederate for being patient and politely directed the research participant to take a seat across from the confederate. The investigator then began reading from the script describing the getting-to-know-you task (Appendix G). Participants alternated by choosing questions concealed in an envelope. The questions are a way for the participant and confederate to get to know each other. They were instructed to refrain from asking additional questions that are not contained in the envelope. One participant asked the other the first question chosen from an envelope. The other participant then answered and then asked that same question of the first partner. Both participants asked and answered each question in the envelope. If for some reason the participant did not feel comfortable answering a question they would notify the confederate. The confederate's job was to help guide and evaluate the interaction with the research participant. If the research participant had a question during the conversation in the "getting-to-know-you" task, the confederate subtly assisted the research participant (i.e., "I think it's your turn to choose from the list of questions" or "You can choose first if you'd like"). If the

confederate recognized that a participant did not feel comfortable answering or asking a question, the confederate reminded the participant that they can pass if they wish. The confederate was blind to the participant's randomization group and based his responses from a predetermined script in order to standardize the responses (Appendix I). Once the "getting-to-know-you" task was completed, the confederate opened the door and let the investigator know that they had finished.

After the "getting-to-know-you" induction task, the confederate assessed the participant's as well as his own behavior towards self-disclosure and intimacy based on the interaction. The participant was led next door by the investigator and watched the same animation clip that they initially viewed. Due to the lengthy "getting-to-know-you" task, participants watched the animation clip once prior to evaluating the degree of self-disclosure and intimacy in the interaction with the confederate. The intention behind watching the animation prior to filling out the questionnaires is that it serves to additionally prime the participant's responses to perceived level of self-disclosure and intimacy.

Finally, participants filled-out a demographic measure (Appendix K) and a self-report attachment style measure, which took approximately 15 minutes to complete. Participants' names were not included in any forms or questionnaires. Participants' information was saved on a separate data file from their responses; ensuring that their responses were confidential and anonymous.

The participants were debriefed with the investigator once they completed the questionnaires (Appendix M). The participant was informed of the intended priming effect of the animations and "getting-to-know-you" task as well as learning that the other

participant was a trained member of the research team, called a confederate, whose job it was to guide the interaction based on a script and evaluate the interaction. In the debriefing session, participants were informed that the confederate is a graduate student in the clinical psychology department and his answers were determined before the study. His responses were based and reflected actual experiences in his life and he was trained to respond to the questions in a natural and genuine way.

Participant's responses were also used as part of the confederate's Master's thesis. A copy of the addendum to the consent form was given to participants during the debriefing phase of the study (Appendix B). The reason that the addendum was given at this time (rather than at the beginning of the study) is that in the study the confederate was used. By mentioning his name at the beginning of the research would have exposed his position as a confederate in the project. Participants were given the addendum to the consent form midway through the debriefing process and had opportunities to ask questions about the addendum if any arose.

Students participating in the Psychology Experience Credit (PEC) Program provided their SONA ID at the conclusion of the study, in order to receive their PEC receipt and students who were recruited through on-campus flyers received their $15 Amazon gift card and a receipt indicating that they received their gift card.

Chapter V

Results

The results section is divided into three main sections. First, a preliminary analysis evaluates distributions and identify covariates among study variables followed by hypothesis testing of main and exploratory hypotheses. The final section consists of a post-hoc analysis.

Preliminary Analyses

Demographics. The summary of the demographic data is presented below in Table 1. The ages ranged from 18 to 43 years, with 22.67 being the mean age ($SD =$ 5.67). There were 62 females (68.9%) and 28 males (31.1%) who participated in the study. The participants were randomly assigned to one of the three groups using a random numbers chart. Each group consisted of 30 participants. In the linguistic condition, ages ranged from 18 to 40 years, with 21 females (70%) and 9 males (30%). In the non-linguistic embodied condition, ages ranged from 18 to 36 years, with 21 females (70%) and 9 males (30%). In the control group, ages ranged from 18 to 35 years, with 20 females (66.7%) and 10 males (33.3%). The total sample fell into the following ethnic categories: 21 were African Caribbean (23.3%), 17 were Asian (18.9%), 15 were Other (16.7%), 12 were African American (13.3%), 11 were Latino (12.2%), 7 were Caucasian (7.8%), 7 were Middle Eastern (7.8%).

Missing data. It should be noted that there was missing data on the demographic questionnaire. Approximately 17% of the sample did not answer total household income

Table 1

Demographic Data (N=90)

Whole Sample	*n*	*Percent*
Gender:		
Male	28	31.1
Female	62	68.9
Ethnic Background:		
Caucasian	7	7.8
African American	12	13.3
African Caribbean	21	23.3
Latino/a	11	12.2
Asian	17	18.9
Middle Eastern	7	7.8
Other	15	16.7
Marital Status:		
Married	4	4.4
Not Married, Living Together	4	4.4
Divorced	3	3.3
Separated	2	2.2
Single, Not Living with Partner	77	85.6
Highest Degree Obtained:		
High School	68	75.6
Community College or Junior College	8	8.9
Bachelor's Degree	9	10.0
Master's Degree	4	4.4
Doctoral Degree	1	1.1
Personal Income:		
Less than $3,900	47	56.0
Between $4,000-$12,999	15	17.9
Between $13,000-$19,999	4	4.8
Between $20,000-$34,999	7	8.3
Between $35,000-$54,999	8	9.5
Between $55,000-$76,999	1	1.2
Between $77,000-$97,999	2	2.4
Total Household Income:		
Less than $3,900	13	17.3
Between $4,000-$12,999	6	8.0
Between $13,000-$19,999	7	9.3

Between $20,000-$34,999	12	16.0
Between $35,000-$54,999	14	18.7
Between $55,000-$76,999	9	12.0
Between $77,000-$97,999	6	8.0
Between $98,000-$149,999	4	5.3
Above $150,000	4	5.3
Religious Affiliation:		
Buddhism	1	.9
Catholic	20	18.5
Christian	25	23.1
Hindu	1	.9
Islam	18	16.7
Jewish	4	3.7
Non-Denominational	11	10.2
Other	2	1.9

(15 participants) and 6% did not report indiviudal income (6 participants). Similarly, 9% (8 participants) did not report a religious affiliation.

Distribution of data. As shown in Table 2, evaluation of skewness and kurtosis of the dependent variables and exploratory variables indicated that they were normally distributed. The dependent variables included how well the participant and confederate know each other, likelihood of future friendship, felt closeness and intimacy, participant and confederate degree of self-disclosure, and degree of responsiveness. The two scales of the Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996) has two dimensions--ambivalence and avoidance scores.

The Cronbach's alpha for the Avoidance scale (.77) is slightly higher than the coefficient alphas for men (.70) and women (.74) as measured by Simpson et al. (1996), while the Cronbach's alpha for the Ambivalent scale (.72) is within the range for males (.72) and females (.76).

Correlations among study variables. Correlation coefficients were computed among the dependent variables and the demographic scales (age, ethnicity, marital status, gender, education level, and household income). The results of the correlation analyses are presented in Table 3.

As a preliminary analysis for the second hypothesis, correlational coefficients were also computed among the demographic variables and the three attachment scores-- avoidance, and ambivalence, and total attachment—from the Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996). The results are presented in Table 4. There was one statistically significant relationship between ambivalence and marital status ($r = .24$, $p = .02$). A correlation analysis was also run with the dependent

Table 2

Comparison of Means, Standard Deviations, and Tests of Normality and Reliability of Measures for the Dependent Variables and Attachment Scores

	n	Mean (SD)	Skewness Statistic (SE)	Kurtosis Statistic (SE)	Cronbach's Alpha
Know the Other	90	9.08 (2.09)	-0.35 (.25)	-0.28 (.50)	.87
Future Friendship	90	9.94 (2.27)	-0.64 (.25)	-0.26 (.50)	.87
Closeness Felt	90	18.83 (3.63)	-0.21 (.25)	-0.80 (.50)	.83
Participant Disclosure	90	18.62 (4.52)	-0.07 (.25)	-0.71 (.50)	.87
Confederate Disclosure	90	24.96 (3.46)	-0.20 (.25)	0.67 (.50)	.87
Participant Responsiveness	90	11.34 (1.71)	-0.58 (.25)	0.04 (.50)	.88
Total Avoidance Attachment Score	30	29.71 (8.22)	0.17 (.25)	-0.26 (.50)	.77
Total Ambivalent Attachment Score	30	32.30 (9.31)	0.25 (.25)	-0.04 (.50)	.72

Note. *Total Avoidance Attachment Score and Total Ambivalent Attachment Score are* two dimensions of the Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996).

Table 3

Correlations Between Demographic Variables and Dependent Variables

	Age (n = 90)	Highest Degree Obtained (n = 90)	Gender (n = 90)	Total Household Income (n = 75)
Know the Other	.17	.09	-.04	-.01
Future Friendship	.25*	.16	-.18	.19
Closeness Felt	.23*	.17	-.18	.05
Participant Disclosure	.20	.26*	-.14	.09
Confederate Disclosure	.19	.21*	-.13	.04
Participant Responsiveness	.25*	.15	-.16	.08

Note. r = Pearson correlation coefficient; $* p < .05$, two-tailed. $**p < .01$, two-tailed.

Table 4

Correlation Between Demographic Variables and Attachment Scores

	Age	Highest Degree Obtained	Gender	Total Household Income
	(n = 90)	*(n* = 90)	*(n* = 90)	*(n* = 75)
Total Avoidance	.08	-.01	.19	-.07
Total Ambivalence	.02	.16	.03	-.16
Total Attachment	.06	.10	.13	-.15

Note. r = Pearson correlation coefficient; * $p < .05$, *two-tailed.* *Total Avoidance Attachment Score and Total Ambivalent Attachment Score* are two dimensions of the Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996)

variables and the three attachment scores. The results are presented in Table 5. There were no statistically significant relationships.

Hypothesis Testing

Hypothesis 1. The current study hypothesized that there would be significant differences in the measure of intimacy and self-disclosure across the three experimental conditions, such that the two experimental conditions (Linguistic and Non-Linguistic Embodied groups) would have significantly higher intimacy and self-disclosure scores than the control group.

A one-way multivariate analysis of covariance (MANCOVA) was conducted to evaluate whether the differences in intimacy and self-disclosure scores were equal across all groups when controlling for covariates—age, ethnicity, marital status, education, gender, and household income. The independent variable includes a single factor differentiating the three groups (linguistic, non-linguistic embodied, and a control group).

The six dependent variables (how well they feel they know the other person, likelihood of future friendship, felt closeness and intimacy, participant degree of self-disclosure, confederate degree of self-disclosure and degree of responsiveness) are the sum of the intimacy and self-disclosure scores between the participant and the confederate rated in the "getting-to-know you" task.

Covariate analysis. The six covariates were: age, ethnicity, marital status, education, gender and household income. The Levene's test of homogeneity of variance revealed the three groups to be sufficiently similar ($F(2, 72) = 1.06, p = .36, \eta 2= .11$). We can assume the dependent variable scores are homoscedastic in all cells.

Table 5

Correlations Between Attachment Scores and the Dependent Variables

	Total Avoidance ($n = 90$)	Total Ambivalence ($n = 90$)	Total Attachment ($n = 90$)
Know the Other	-.02	.04	.02
Future Friendship	-.03	.13	.06
Closeness Felt	-.03	.13	.06
Participant Disclosure	.01	.04	.03
Confederate Disclosure	-.12	-.01	-.07
Participant Responsiveness	-.12	.05	-.03

Note. r = Pearson correlation coefficient. *Total Avoidance Attachment Score and Total Ambivalent Attachment Score are* two dimensions of the Adult Attachment Questionnaire (AAQ, Simpson, Rholes, & Phillips, 1996)

The effect of the covariate (marital status) was the only significant effect with the dependent variable, confederate self-disclosure, $(F(1, 73) = 5.88, p = .02, \eta2 = .08)$. A one-way analysis of covariance (ANCOVA) was conducted. A preliminary analysis evaluating the homogeneity-of-slopes assumption indicated that the relationship between the covariate (marital status) and the dependent variable (confederate self-disclosure) did not differ significantly as a function of the independent variable, $(F(2, 84) = 0.52, p = .56, \eta2 = .01)$ which is only 1% of the variance. The ANCOVA was significant, $(F(2, 86) = 12.50, p < .01, \eta2 = .23)$ suggesting a moderate to high difference between the confederate self-disclosure and the experimental conditions, with marital status accounting for approximately 23% of the variance of the dependent variable. The linguistic $(M = 25.40)$ and embodied $(M = 26.67)$ conditions had the largest adjusted means compared to the control condition $(M = 22.80)$. Follow-up tests were conducted to evaluate pair-wise differences among the adjusted means. The Holm's sequential Bonferroni procedure was used to control for Type I error across the three pairwise comparisons. There were significant differences in the adjusted means between the linguistic and control condition and embodied and control conditions, but no significant differences between the linguistic and embodied groups.

The results of the multivariate tests of goodness of fit of the model demonstrated that the independent variable, condition, had a significant main effect, $(F(2, 70) = 4.29, p < .01, \eta2 = .30)$. The MANCOVA results demonstrating the direct effects of the condition were significant for all dependent variables, except responsiveness. The results are presented in Table 6.

Analyses of variance (ANOVA) for each dependent variable were conducted as

Table 6

The Results of the Multivariate Tests of Goodness of Fit of the Model

| | Experimental Groups | | | $F (2, 70)$ | $\eta 2$ | Pairwise Comparison |
| | Linguistic | Non-Linguistic Embodied | Control | | | |
	$n = 30$ *Mean (SD)*	$n = 30$ *Mean (SD)*	$n = 30$ *Mean (SD)*			
Know the Other	9.47 (1.96)	9.80 (1.73)	7.97 (2.16)	7.39*	.15	1,2 >3
Future Friendship	10.90 (2.21)	10.47 (1.74)	8.47 (2.10)	12.61*	.23	1,2 >3
Closeness Felt	19.70 (3.29)	20.57 (3.21)	16.23 (2.91)	16.22*	.27	1,2 >3
Participant Disclosure	20.20 (3.92)	20.63 (3.78)	15.03 (3.61)	21.04*	.33	1,2 >3
Confederate Disclosure	25.40 (3.19)	26.67 (3.57)	22.80 (2.48)	12.51*	.23	1,2 >3
Participant Responsiveness	11.47 (1.76)	11.97 (1.50)	10.60 (1.63)	5.41	.11	1,2 >3

Note. $\eta 2 =$ Partial eta squared; * $p < .05$, *two-tailed.*

follow-up tests to the MANCOVA. Using the Bonferroni method, each ANOVA was tested at the .008 level (.05/6 = .008). The differences among group ratings were in the directions predicted. Hypothesis 1 predicted that there would be significant differences in the measure of intimacy and self-disclosure scores across the three experimental conditions. Specifically, it was hypothesized that the two experimental conditions (Linguistic and Non-Linguistic Embodied group) would have significantly higher intimacy and self-disclosure scores than the control group. There were significant differences in the adjusted means between the linguistic and control condition and embodied and control conditions for the following dependent variables: likelihood of future friendship (Linguistic, M = 10.90; Embodied, M = 10.47; Control, M = 8.47), felt closeness and intimacy (Linguistic, M = 19.70; Embodied, M = 20.57; Control, M = 16.23), degree of participant self-disclosure (Linguistic, M = 20.20; Embodied, M = 20.63; Control, M = 15.03) and confederate self-disclosure (Linguistic, M = 25.40; M = 25.40; Embodied, M = 26.67; Control, M = 22.80). For one dependent variable, how well they know the other person, there was only a significant relationship between the embodied and control condition (Linguistic, M = 9.47; Embodied, M = 9.80; Control, M = 7.97) and not between the linguistic and control. There were no significant differences in means for the responsiveness variable (Linguistic, M = 11.47; Embodied, M = 11.97; Control, M = 10.60).

Hypothesis 1a. As part of an exploratory hypothesis to the first hypothesis, the current study examined whether there would be a difference in intimacy and self-disclosure scores between the Linguistic and Non-Linguistic Embodied group. Post hoc analyses to the univariate ANOVA consisted of conducting pairwise comparisons to find

which condition effected the dependent variables most strongly. Each pairwise

comparison was tested at the .008 level. The linguistic and embodied groups were not

significantly different from each other on the six dependent variables.

Hypothesis 1b. As part of an exploratory hypothesis to the first hypothesis, the

current study compared whether there was a difference between participant self-

disclosure of factual information versus emotional disclosures across the three conditions.

The ANOVA was significant for participant's rating of self-disclosure of factual

information ($F(2, 86) = 12.45$, $p < .001$, $\eta2 = .22$) accounting for 22% of the variance.

Participant ratings were higher for self-disclosure of factual information versus feelings

in all three conditions; however, there was no significant difference in participant rating

of self-disclosure of factual information between the linguistic and embodied conditions.

The ANOVA was also significant for participant ratings of emotional disclosure, ($F(2,$

$86) = 12.41$, $p < .001$, $\eta2 = .22$) accounting for 22% of the variance. Similarly, there was

no significant difference of participant rating of emotional self-disclosure between the

linguistic and embodied conditions. The results of participant ratings across the three

conditions are presented in Table 7.

An ANOVA was also run to determine whether there was a difference between

confederate ratings of participant self-disclosure of factual information and feelings

across the three conditions. The ANOVA was significant for participant's rating of self-

disclosure of factual information ($F(2, 86) = 8.76$, $p < .01$, $\eta2 = .17$) accounting for 17%

of the variance. The ANOVA was significant for participant's rating of emotional self-

disclosure ($F(2, 86) = 9.99$, $p < .01$, $\eta2 = .18$) accounting for 18% of the variance.

Table 7

ANOVA Between Groups Comparison of Participant Self-Disclosure of Factual Information and Emotional Disclosures

Across the Three Conditions

	Experimental Groups			Simple Effects		Pairwise Comparison
	Linguistic	Non-Linguistic Embodied	Control	F (2, 86)	$\eta2$	
	$n = 30$	$n = 30$	$n = 30$			
	Mean (SD)	*Mean (SD)*	*Mean (SD)*			
Participant Disclosures: Factual	5.03 (1.32)	5.33 (1.40)	3.63 (1.50)	12.45**	.22	1,2 >3
Participant Disclosures: Emotional	4.87 (1.25)	5.00 (1.31)	3.50 (1.31)	12.41 **	.22	1,2 >3

Note. $\eta2$ = Partial eta squared; ** $p < .01$, *two-tailed.*

However, confederate rating of factual and emotional disclosure was not significantly different between the linguistic and embodied conditions. The results are presented in Table 8.

Correlational analyses also demonstrated that there was a significant relationship between confederate ratings of participant self-disclosure of factual information and emotions and participant's reported degree of self-disclosure of factual information and feelings. The results are presented in Table 9.

Hypothesis 2. It was predicted that there would be significant positive correlations between secure attachment style and the intimacy and self-disclosure scores.

Based on the preliminary correlational results (see Table 5), there was no significance between secure attachment and the dependent variables. The following are comparison of means and standard deviations for Avoidant ($M = 29.71$, $SD = 8.22$) and Ambivalent Attachment ($M = 32.30$, $SD = 9.31$) scores. The total attachment score was positively correlated with both the avoidance ($r = .39$) and ambivalence ($r = .81$) subscales, see Table 10. The total mean ambivalent scores (Linguistic: $M = 29.50$, $SD = 10.41$; Non-Linguistic Embodied: $M = 29.67$, $SD = 6.85$; Control: $M = 29.91$, $SD = 7.20$) were higher across all three conditions than the total mean avoidant scores (Linguistic: $M = 31.50$, $SD = 9.84$; Non-Linguistic Embodied: $M = 33.37.67$, $SD = 9.09$; Control: $M = 32.03$, $SD = 9.19$).

Hypothesis 2a. As part of an exploratory hypothesis, the current study examined the interaction of attachment style and the experimental conditions using an ANCOVA. Since attachment style had no effect on intimacy and self-disclosure, it was demonstrated

Table 8

ANOVA Between Groups Comparison of Confederate ratings of Participant Self-Disclosure of Factual Information and

Feelings Across the Three Conditions

	Experimental Groups			Simple Effects		
	Linguistic	Non-Linguistic Embodied	Control	Ff (2, 86)	$\eta 2$	Pairwise Comparison
	$n = 30$	$n = 30$	$n = 30$			
	Mean (SD)	*Mean (SD)*	*Mean (SD)*			
Confederate Disclosures: Factual	5.40 (1.13)	5.30 (1.09)	4.99 (1.26)	8.76*	.17	1,2 >3
Confederate Disclosures: Emotional	4.90 (1.34)	5.00 (1.17)	3.63 (1.43)	9.99 *	.19	1,2 >3

Note. $\eta 2$ = Partial eta squared; ** $p < .05$, *two-tailed.*

Table 9

Correlational Analyses of Confederate Ratings of Participant Self-Disclosure of Factual Information and Emotions and

Participant's Reported Degree of Self-Disclosure of Factual Information and Emotions

	Confederate Disclosure: Factual ($n = 90$)	Confederate Disclosure: Emotional ($n = 90$)	Participant Disclosure: Factual ($n = 90$)	Participant Disclosure: Emotional ($n = 90$)
Confederate Disclosure: Factual	–			
Confederate Disclosure: Emotional	.80	–		
Participant Disclosure: Factual	.33*	.33*	–	
Participant Disclosure: Emotional	.37*	.33*	.82*	–

Note. r = Pearson correlation coefficient; * $p < .05$, *two-tailed.*

Table 10

Correlation of the Avoidant and Ambivalent Attachment Scores

	Total Avoidance Score	Total Ambivalence Score	Total Attachment Score
Total Avoidance Score	–		
Total Ambivalence Score	.39*	–	
Total Attachment Score	.81*	.86*	–

Note. r = Pearson correlation coefficient; * *p* < *.05, two-tailed.*

as expected, that there were differences in intimacy and self-disclosure scores between the control group and the two experimental conditions. However, since attachment style had no effect on intimacy and self-disclosure, the results showed that there was not a difference in intimacy and self-disclosure scores between the linguistic and the non-linguistic embodied groups $(F(4, 86) = 0.19, p = .94, \eta2 = .01)$.

Post-Hoc Analysis

There was no significant relationship between condition and time spent in the relationship task $(F(2, 87) = 2.80, p = .07, \eta2 = .06)$. Participants in the Linguistic group spent a mean time of 710 seconds engaging with the confederate compared to 677 seconds in the Non-Linguistic Embodied group and 610 seconds in the Control group. Between the Non-Linguistic Embodied condition and the Control condition there were significant differences on the time spent physically replicating the 30-second animation $(F(1, 59) = 3.91, p = .05$, partial $\eta2 = .06)$. Participants in the Control condition on average spent 43 seconds replicating a 30-second animation compared to the Non-Linguistic Embodied condition in which participants spent 52 seconds physically replicating a 30 second animation. In terms of the judge's assessment of the accuracy of the replication there was also a significant difference $(F(1, 59) = 5.80, p = .02, \eta2 = .09)$. Participants in the Control condition on average scored a rating of 4.1 out of 7 for the accuracy of their replication compared to the Non-Linguistic Embodied condition in which participants scored 4.7 out of 7 for accurately replicating the animation. The judge's assessment of the replication and participant self-disclosure in the Non-Verbal Embodied condition were significantly correlated $(r = .38, p < .01)$.

In the linguistic condition on the semantic differential there were significant

correlations that attributed the small triangle to being kind and feminine ($r = .41$, p = .02),

while the big triangle was kind and masculine ($r = .39$, $p = .03$). The small triangle was

seen as shy and passive ($r = .50$, $p < .01$), while interacting with the big triangle that was

characterized as cooperative and active ($r = .46$, $p < .01$). Similarly there was also a

significant correlation between the small triangle as powerless and the big triangle as

powerful ($r = -.43$, $p = .02$). Overall, 90% of participants in the Linguistic condition

objectively rated that the big triangle felt loving (27 out of 30 participants) at the end of

the animation. Similarly, 50% of participants (15 out of 30) and 30% (10 out of 30) rated

that the little triangle felt secure and proud, respectively, at the end of the animation.

Chapter VI

Discussion

The goal of the current project was to gain a better understanding of the factors that impact self-disclosure and intimacy between two people. Researchers within social and cognitive psychology are only beginning to look at the unique characteristics and thought processes that initiate a move toward thinking metaphorically and how those cognitive processes subsequently impact intimacy and self-disclosure within an interpersonal encounter. The current study also examined the interaction effect of attachment style and intimacy on self-disclosure between participants and a confederate.

Metaphorical Processing: Influence on Intimacy and Self-Disclosure

A sparse literature suggests that the use of metaphorical understanding is important in developing greater intimacy between two people. Within the social-cognitive experimental literature, a handful of studies have indicated that manipulating perceptions, sensations, and other sensory-motor states through embodied primes produces metaphor-consistent changes in how information is attended to, recalled, and interpreted in interpersonal relationships. Landau et al. (2010b) studied how metaphors prime intimacy and induce connection with others (versus protection). Landau et al. found that participants primed with the "protection" animation chose to answer fewer intimate questions as compared to participants in the control condition. However, Landau et al.'s (2010b) study was limited by only evaluating interest in connecting to others, not actual intimate behavior in a relational encounter after the metaphorical visual prime. The current research study evaluated both interest and actual behavior towards

self-disclosure and intimacy with others in a relationship induction task (Sedikides et al., 1998).

In the current study, there were significant differences in intimacy and self-disclosure scores across the three conditions after controlling for the participant's gender, age, marital status, ethnicity, and individual and family income. The two metaphorical experimental conditions, Linguistic and Non-Linguistic Embodied groups, reported significantly higher intimacy and self-disclosure scores on questions examining: likelihood of future friendship, felt closeness and intimacy, degree of participant self-disclosure and confederate self-disclosure than the non-metaphorical control group. There was not a significant difference in means for responsiveness across the three conditions. On average, the participants in the Linguistic and Non-Linguistic Embodied groups spent longer time conversing with the confederate in the relationship task than participants in the control group.

These findings suggest that the thought processes that initiate a move toward thinking metaphorically subsequently impact intimacy and self-disclosure within an interpersonal encounter in a new relationship. The results confirmed Landau et al.'s (2010b) study by demonstrating that metaphoric effects on self-disclosure and intimacy should be obtained even in contexts where the participant does not linguistically process the presented stimulus. Taken as a whole, the empirical findings suggest that non-linguistic and linguistic metaphoric processing shaped how participants processed and ultimately impacted actual behavior towards self-disclosure and intimacy in a relational encounter with a confederate.

Effectiveness of Non-Linguistic versus Linguistic Conceptualization of a Stimulus

As part of an exploratory hypothesis extending these findings, there were no significant differences between intimacy and self-disclosure scores between the Linguistic and Non-Linguistic Embodied groups. Thus, the different presentation mode of the prime did not result in any significant findings.

In principle, animations tell stories; they are narratives. An animation is a series of frames, so that each frame appears as an alteration of the previous one (Betrancourt & Tversky, 2000). Another way to tell a story is a sequence of static graphics. Tversky et al. (2002) describe that people are known to interpret movements of geometric figures as having causality, agency, and even intention. Properly staged, triangles moving in a sparse environment can be seen as chasing, playing, hiding, coaxing (Castelli et al., 2002; Gelman, Durgin and Kaufman, 1995; Heider & Simmel, 1944). The simple animation of a meaningful sequential can guide construction of a mental model as well as facilitate memory for it. According to Betrancourt and Tversky (2000), a well-designed animation can be expected to facilitate drawing inferences more than actually remembering information or, in other words, transfer rather than learning. It is possible that the encoding, processing, and interpretation of the animation alone could have been just as effective with or without the linguistic appraisal and embodied re-enactment.

O'Regan and Noe (2001) defend that visual perception is a way of "acting," a kind of skillful activity on the part of the perceiver. Thus perceptual experience involves both a kind of "acting" and a distinctive kind of "knowledge" (Veldeman, 2008). Consider the phenomenon known as perceptual presence. It is an essential part of the phenomenology of perception that one has a feeling of presence of features of which we

are not strictly aware, such as unattended details, or the far sides and occluded portions of objects. For example, when one views an orange, one visually experiences the "whole" orange, not merely its facing surface. The presence of the whole object is something one infers on the basis of limited sensory information. The sense of presence is a matter of thinking rather than visually experiencing. It is possible that participants watching the animation see how the triangles appear (i.e., their size, color, pattern of movement in space) and symbolically interpret how they are (i.e., loving, frustrated, or protective). The relevant distinction is not simply between the shape's surface and the animation's subject, but rather, between two kinds of content, interplaying with each other.

Multi-sensory presentation of images contain information on what individuals consciously and non-consciously sense or view, and how they apply that new information to a new experience (Bargh, 2002). Individuals in the Linguistic group processed the visual stimuli followed by written appraisal, allowing for possible greater integration and introspection (Barsalou, 1999). One important question in multi-modal processing of information is the order in which each medium is presented. For example, Mayer and Anderson (1992) found that using an animation with concurrent narration yielded better performance in transfer problem solving than succesive display of each medium (i.e., narration preceding or following the animation). Sequential presenation of medium can be examined in future studies with animations.

Social cognitive theory has traditionally relied on the assumption that concepts are mentally represented in terms of linguistic content (Glucksberg & Keysar, 1990). Zwaan et al. (2002) suggest that the mental representation responsible for our comprehension of motion likely involves perceptual simulation and linguistic appraisal of

the described events. In the Linguistic group, following the animation participants filled out a semantic differential scale used for measuring the connotative or subjective meaning of the presented video animation. Based on the animation, there were significant correlations between the interaction of the small triangle and the big triangle in the visual prime. Participants rated the small triangle as being kind, feminine, shy, passive, and powerless, while the big triangle was rated as kind, masculine, cooperative, active, and powerful. The responses to the visual prime indicated that the participants attributed metaphorical and culturally-based meaning to the actions, personality traits, and intentions of the shapes in the animation that potentially led to creating a narrative in how they related to each other. The viewer's unique understanding and connotative meaning of the animation potentially helped participants generate associations, and tap into new, different, or deeper levels of meaning.

In addition, participant ratings correlated the big triangle to feel loving at the end of the animation, while participant ratings correlated the little triangle as feeling secure and proud. Thus leading up to the relational encounter with the confederate, participants linguistically appraised a collaborative, cooperative, and trusting relationship in the animation, which might have helped participants feel less anxious and inhibited, more communicative and safe in the relational encounter. If a stranger or new acquaintance resembles a mental representation for a positive or safe other, such as a parent or close friend, then unconscious processes can be activated that increase the possibility for self-disclosure (Anderson & Adil Saribay, 2005). This might suggest that the more articulate and available a given schema is for interactions in relationships, the more accessible it is for potential use in processing and interpreting a novel interaction. Participants, prior to

the relational encounter, potentially activated a capacity to envision mental states in themselves and others, a form of symbolic or metaphoric processing (Fonagy et al., 2002).

Overall, the Non-Linguistic Embodied condition spent more time processing and physically re-enacting the visual stimulus and were more accurate integrating the visual and motor sensory information than the control condition. O'Regan and Noë (2001) described that our visual system and our bodily movement and the feedback it generates are so tightly integrated that by physically copying a visual stimulus one is able to perform cognitive tasks, such as remembering, more effectively by using one's body to simplify the nature of cognitive processing (Donald, 1991). By allowing participants to reconstruct the movement they just saw, learners are actively processing the information, which contributes to the construction of a mental model (Koning & Tabbers, 2011). Thus, the Non-Linguistic group may have integrated the visual-motor information in a multi-modal manner. Similarly, when animations are meaningfully organized (e.g. "Coaxing" animation compared to apparent random movement (e.g. "Drifting" animation) learning and understanding is faster (Betrancourt & Tversky, 2000). Thus the integration of the visual-motor processing was automatically activated during the conceptualization in the Non-Linguistic Embodied group, which was more effective than the control group. The participants in the Non-Linguistic Embodied condition spent more time and gave greater effort than the Control condition when processing the visual stimulus. This finding could have aided the Non-Linguistic Embodied condition to integrate the stimulus more effectively. And, it is also possible, even without linguistically appraising the "Coaxing"

animation, the Non-Linguistic embodied group potentially came up with an internal verbal dialogue of the animation to help encode the stimulus.

Researchers have also distinguished between factual (i.e. descriptive) and emotional disclosure (i.e. one's private feelings, opinions, and judgments) when examining the impact of disclosing in relationships (Morton, 1978; Reis & Shaver, 1988). Participant ratings were higher for self-disclosure of factual information versus emotions in all three conditions, however there was no significant difference in participant rating of self-disclosure of factual information between the linguistic and embodied conditions. This supports the notion that people may be cautious in revealing personal feelings at the beginning of a relationship with a stranger (Taylor, 1968). Participants must weigh the benefits of self-disclosure against its risks, including uncertainty about the other's reactions and concerns about trusting the confederate. Correlational analyses also indicated that there was a significant relationship between confederate ratings of participant self-disclosure of factual information and feelings and participant's reported degree of self-disclosure of factual information and feelings, thus highlighting the confederate's accurate perception of the participant's level of disclosure.

Interaction Between Metaphorical Primes and Attachment Style on Intimacy and Self-Disclosure

Attachment theory is a framework that has been used to examine individual differences in self-disclosure and intimacy in relationships (Grabill & Kerns, 2000; Mikulincer & Nachson, 1991; Pistole, 1993). Mikulincer and Nachson's (1991) work on self-disclosure, intimacy, and attachment style, reported that secure individuals feel more comfortable and are more likely to reciprocate highly intimate disclosure than individuals

classified as avoidant and ambivalent. However, the current study, indicated that there was no statistical significance between secure attachment and the dependent variables of intimacy and self-disclosure. Avoidant and ambivalent scores were slightly higher than the normed scores based from Simpson et al. (1992). This finding is surprising considering there was statistical significance for participants in the experimental conditions that reported a likelihood of future friendship, felt closeness and intimacy, and self-disclosure with the confederate. Participants were able to experience a sense of closeness, intimacy, and self-disclosure despite self-reports of insecure attachment style. The results of the study tend to suggest a leaning towards a social cognitive perspective of relating to a new peer, in which one's momentary thoughts, feelings, unaware thoughts and feelings, and interpretations of events have a fundamental influence on behavior with another. Attachment theorists link between enduring and stable attachment and communication patterns that consistently impact interpersonal encounters across time, situations, and behavioral content was not consistent in the current study (Noftle & Gillath, 2009).

Limitations of the Study

Although this work represents a good step forward in exploring the implications of embodied cognition and the impact of metaphorical processing, it does suffer from a few limitations. One potential limitation in the current study was the choice of the visual animation for the primed stimulus. Kövecses (2010) defined metaphoric creativity based on the context of the metaphorical conceptualization and the resulting metaphorical processing. The majority of studies in embodied cognition rely on unconsciously manipulating or priming one domain (i.e. vertical height, closeness, or temperature) and

examining how it transfers over to a dissimilar domain (i.e., intimacy). This study took a different approach, since individuals usually construct multiple meanings and attribute a variety of metaphorical meaning to a given stimuli or prime. The "coaxing" animation used for the priming stimulus in the two experimental conditions was initially intended by Castelli et al. (2002) to investigate theory of mind with autistic and non-autistic individuals. The animations were intended to depict an interaction involving one triangle reacting to the other triangle's mental state. In the current study, the animation's intention was to activate metaphorical processing to conceptualize abstract representations based on the concrete movement of shapes. However, this specific animation involves shapes interacting in what appears to be a relational encounter. It is likely that this particular animation and subsequent appraisal automatically primes for a relational experience that could have easily transferred over to the subsequent relationship task with the confederate. In the methodology, there was sufficient time and distractions built-in to interfere with the prime's potential immediate impact during the relationship task. However, future research can utilize a primed animation that does not depict a potential interaction involving multiple shapes and investigate whether creative metaphorical processing elicits self-disclosure and intimacy in relationships.

There was also a limitation in the methodology in how the self-report and intimacy scales were rated. For example, differences between participant and confederate reporting of felt closeness, degree of self-disclosure and intimacy raise the concern that both groups may underreport or over-report due to a lack of awareness or potential discomfort with acknowledging certain feelings or thoughts. One way to address this problem would have been to use observer-based measures to detect self-disclosure and

intimacy scales. For example, Colli and Lingiardi (2009) developed an observer-based

method—the Collaborative Interaction Scale (CIS) that codes a therapeutic session

between a patient and therapist. A strength of the CIS is that it assesses both patients'

and therapists' positive and negative contributions to the therapeutic process. In the

current study, a written transcript was used. A video recording of the relationship task

could have been more useful. Outside raters could have objectively rated the dependent

variables based on watching the video and rated different markers of self-disclosure and

intimacy.

Another limitation of the current study was the extreme diversity of the sample,

with at least ten ethnic groups, none of which comprised more than 23% of the sample.

The study did not include means of controlling for the different ways in which self-

disclosure and degrees of intimacy were negotiated in culturally unique ways with the

confederate, who was a Caucasian male in his mid-20s. Potential relationships between

these variables could have been veiled by cultural and gender variations.

Future Research

Many phenomena in the world of cognitive psychology hold under one set of

conditions but disappear under another set of conditions (Klein et al., 2012; Waroquier,

2009). Past priming studies in embodied metaphor rarely replicate the experiment exactly

but instead, carry out conceptual replications that test similar hypotheses using

completely different methods. Subtle differences in protocols between the original study

and the replication attempt may cause discrepant findings; even small changes in research

designs could impact the results. Despite challenges in replicating priming studies, a

more concerted effort must be made in future research. A future replication of the current

study is necessary before applying the concept to different methods. Doyen, Klein, Pichon, and Cleeremans (2012) notes that the usual way of thinking is that a conceptual replication is even stronger than an exact replication because it gives better evidence for the generalizability of the effect. However, reliance on conceptual replication is problematic. How similar something needs to be to count as a conceptual replication is quite subjective. The phenomenon of interest should be subjected to careful scrutiny. If the basic effect is replicated under the exact conditions as in the original study, but disappears when conditions are changed slightly, then the effect is real but tenuous. That is not ideal, but is certainly worth knowing.

Although there is evidence presented in this study supporting the hypothesis that basic experiences with the physical environment through embodied primes alter behavior, perceptions, and emotional experiences via the activation to metaphorically linked concepts, direct evidence for the process is missing. Future investigations should shed more light on the process by which metaphorical effects occur. Quantitative approaches, similar to the current study, aim to measure embodied knowledge via fixed-point scales (e.g., Rosa & Malter, 2003) and focus on verbal and explicit responses only. Future studies can utilize a qualitative analysis of the process of metaphorical conceptualization, such as von Wallpach and Kreuzer's (2013) multi-sensory sculpting (MSS). Through eliciting embodied knowledge via multi-sensory metaphors, this methodology proposes a multi-layered metaphorical analysis procedure to interpret multi-sensory data. Researchers provide respondents with a simple task description: "Please build a sculpture that represents what the brand means to you by using the materials available in the toolkit." The resulting sculptures consist of multi-sensory materials that are non-verbal,

metaphorical expressions of mental images. Non-directive questions encourage

respondents to express embodied knowledge in a metaphorical way that is similar to their

mental representations. Researchers continuously relate verbal metaphors to

corresponding non-verbal metaphors (i.e., materials the sculpture contains and senses

these materials stimulate) in order to extract underlying meanings. Researchers ultimately

can create an embodied knowledge map (Novak, 1991) that aggregates the results and

illustrates links between the most frequent meanings verbal and non-verbal metaphoric

meanings.

Even though there was not a significant difference in intimacy and self-disclosure

scores between the Linguistic Understanding and Non-Linguistic Embodied groups

future research can examine what contexts or priming conditions might lead to a

difference in processing metaphorical information. One route is to investigate whether

metaphorical priming effects can be found in developing children. Depending on the

child's linguistic capability, if metaphorical transference of sensory experiences can be

used to affect the emotional or behavioral responses of infants and toddlers. Such

findings would suggest that metaphorical priming effects do not depend on a developed

linguistic metaphorical understanding. Conversely, for verbal children, insight into

boundary conditions for metaphorical priming effects might suggest that language-based

metaphorical understanding are necessary prerequisites for these priming effects to occur.

Specific empirical support for the conceptualization of intimacy and self-

disclosure as the outcome of an interpersonal process is only beginning to emerge

(Laurenceau et al., 2004, 2005; Manne et al., 2004). In the current study, participant self-

disclosure and confederate self-disclosure were correlated with intimacy on an

interaction-by-interaction basis. Participant self-report of disclosing information and feelings were correlated with confederate ratings of participant self-disclosure. Similarly, participant perception of confederate self-disclosure was correlated with the confederate's self-report of disclosing information and feelings. Laurenceau, Feldman Barrett, and Pietromonaco (1998) demonstrated that partner responsiveness emerged as a partial mediator of self-disclosure and intimacy. Their findings suggest that effects of disclosures depend, in part, on the perceptions and evaluations of a partner's response. In the current study both participant and confederate ratings of responsiveness was high but not significantly different across the three conditions. Future research on the interpersonal process of self-disclosure and intimacy can further shed light on the role of partner responsiveness as well as emotional vs. factual disclosures in generating intimacy. A content analysis to the study of disclosures and intimacy focuses on the nature of the material being discussed, however, a structural approach, looks not at what the members of a dyad discuss but how they go about structuring their discussion. Underlying this structural view is the assumption that intimacy is conveyed by the style, non-verbal gestures, smooth shifts from one topic to another, and frequent ellipses.

Conclusion

In the current study, embodied metaphors operated from an inductive approach in that they capitalize on the specific contextual situation of the environment rather than being based on assumptions of generality and universality. The rise of embodied cognition across the cognitive sciences has been driven by the understanding that the mind cannot be understood as separate from particular sensory input and motor output

systems to which it is connected. Rather, there is value in considering how we think, emote, and interact with others as a result of our particular sensory and motor systems.

Metaphors play a central role in this context-dependent dimension of integrating our sensory input and interacting with others. From a constructivist viewpoint, metaphorical processing influences the development of thought, meaning-making, and intersubjective understanding. The locus of metaphor is not language at all according to Lakoff (1993) but in the way one conceptualizes one mental domain in terms of another. Social constructivists suggest that this mapping process, whereby concepts are mentally associated with superficially dissimilar concepts, are created rather than just revealed by metaphor. Thus the inherently creative dimension of metaphorical processing has been described as "generative" in the sense that they can lead to novel perceptions, explanations, and inventions (Schon, 1993). Creative ideas are often arrived at by bringing together two apparently unrelated thoughts. Perhaps the potency of metaphorical processing to effect change and impact interpersonal encounters is related to its complexity and ambiguity that allows for multiple interpretations and unique associations to coexist but at the same time can provide clarity and a shared direction. Multiple interpretations and meanings that can typically lead to confusion in human interactions, calls for a sense-making practice such as cognitive mapping that allows individuals to have multiple understandings voiced as a shared understanding.

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Appendix A

Recruitment Scripts

1. Study Name: Understanding Communications in Interpersonal Relationships

2. Description: The goal of this study is to comprehend how people process information and gain a better understanding of communication within a relationship. As a participant, you will be asked to:

    a. Watch short animation clips
    b. Ask and answer questions with a new peer
    c. Complete questionnaires asking about your thoughts, feelings, and experiences about communications in relationships.

3. Eligibility: In order to participate you must be:

    1. currently enrolled at LIU

    2. at least 18 years of age

4. Duration: 45-60 minutes

5. PEC Credits: 1 credit

6. Researcher: Andrew Colitz, M.A.

    Email: interpersonalcommunication2012@gmail.com

Flyer Posted on LIU Campus Bulletin Boards

Understanding Communications in Interpersonal Relationships

Student Investigator: Andrew Colitz, MA

EARN $15 AMAZON GIFT CARD FOR
45-60 MINUTES OF YOUR TIME

Participants are being accepted for a study examining how people process information and gain a better understanding communications within a relationship. As a participant, I will fill out forms that ask me to describe myself as well as my reactions to presented visual information. I will watch short video clips as well as answering and asking questions in a Getting To Know You Task. I will also fill out a handful of questionnaires asking about my thoughts, feelings, and experiences about communications in relationships.

ALL RESPONSES ARE CONFIDENTIAL. Your name will not be linked with any of the information you provide.

Participation takes approximately: 45 minutes. Participants will earn a **$15 Amazon gift card**.

Email to make an appointment: interpersonalcommunication2012@gmail.com

Email Message Interested Students will Receive After Contacting Researcher

Thank you for your interest in my dissertation research.

I am a doctoral student who is looking for adults over the age of 18 to participate in a study examining how people process information and gain a better understanding communications within a relationship. Participation in the research study lasts approximately 45 minutes. As a participant, you will be asked to watch short animation clips, ask and answer questions with a new peer, and complete questionnaires asking about your thoughts, feelings, and experiences about communications in relationships.

Participation is anonymous. You will not be required to provide any personally identifying information. You will have the option to provide your email address to receive a fifteen dollar Amazon gift card. Your email will only be used to e-mail you the gift card.

Also, if you are a Long Island University, Brooklyn, student participating in the Psychology Experience Credit (PEC) Program, you may provide the SONA ID that they were assigned when registering to participate in the PEC program to receive 1.0 credit. Once the study is complete, a copy of your PEC receipt will be placed in a sealed envelope in a basket marked Colitz near the Ph.D. student boxes on the 8th Floor of the Humanities Building.

Your participation in this research is voluntary. You can terminate your participation at any point.

Should you have any questions or wish additional information, feel free to contact the student investigator, Andrew Colitz, at interpersonalcommunication2012@gmail.com.

Appendix B

Informed Consent

Appendix I: LONG ISLAND UNIVERSITY – BROOKLYN CAMPUS
Informed Consent Form for Human Research Subjects

I am being asked to volunteer in a research study conducted by Andrew Colitz, under the supervision of Gary Kose, Ph.D. in the Psychology Department. The purpose of this research is to gain a better sense of how people process information and understand communication within a relationship. As a participant, I will watch a short video clip as well as meeting with another student in a "getting-to-know-you task." You and another student will engage in a short conversation by choosing from a list of questions concealed in an envelope. The questions are a way for each of you to get to know each other. Following the getting-to-know you task, I will fill out a handful of questionnaires asking about my thoughts, feelings, and experiences about communications in relationships. The study will take about 45 minutes to complete. During this time I may be reminded of difficult or sad times in my life and may experience some distress. No other risks are anticipated for participating in this study. Upon completion, I will receive $15 Amazon gift card. While there is no direct benefit to participating in the study, it is reasonable to expect that the results may provide information of value for the field of psychology.

My identity as a participant will remain confidential. My name will not be included in any forms, questionnaires, or interview recordings. This consent form is the only document identifying me as a participant in this study; it will be stored securely in a locked cabinet, available only to the investigator and supervisor. Data collected may be

destroyed five years after the study has been completed. Results will be reported only in the aggregate. If I am interested in seeing these results, I may contact the investigator.

If I have questions about the research I may contact the investigator, Andrew Colitz, or the faculty sponsor, Dr. Gary Kose at (718) 488-3360. If I have questions concerning my rights as a subject, I may contact the Executive Secretary of the Institutional Review Board, Ms. Kathryn Rockett at (516) 299-2523. My participation in this research is voluntary. Refusal to participate or discontinuing participation at any time will incur no penalty or loss of benefits to which I am otherwise entitled.

My signature indicates that I have fully read the above text and have had the opportunity to ask questions about the purposes and procedures of this study. My signature also acknowledges receipt of a copy of the consent form as well as my willingness to participate.

_____

Typed/Printed Name of Participant

_____   _____

Signature of Participant   Date

My additional signature below indicates that I am willing to be contacted in the future with opportunities for participating in other research studies. By checking below I am *not* committing to other studies and will go through separate consent processes for any future studies.

_____   _____

Signature of Participant   Date

E-mail address for future correspondence: _____

Phone number for future correspondence: _____

_____

Typed/Printed Name of Investigator

_____   _____

Signature of Investigator   Date

Addendum to the Informed Consent

In addition to participating in the research study conducted by Andrew Colitz,

M.A., your responses will also be used as part of Adam Formal's, M.A., Master's thesis

("*The Effect of Metaphor on Empathy in Interpersonal Relationships*").

If you any questions, the information in the original consent form that you signed

at the onset of the study may be reviewed with you at the current time. As a reminder,

your identity as a participant will remain confidential. Your name will not be included in

any forms or questionnaires. Refusal to participate or discontinuing participation at any

time will incur no penalty or loss of benefits to which you are otherwise entitled.

_____

Typed/Printed Name of Participant

_____   _____

Signature of Participant   Date

Appendix C

Animation Clips

Animation Screen-Shots

For a viewing of the silent animations used in the study please visit the following website:

http://sites.google.com/site/utafrith/research/animations

The Linguistic & Non-Linguistic Condition animation is entitled: "Coaxing"
The Control Condition animation is entitled: "Drifting"

Linguistic & Non-Linguistic Embodied Condition:
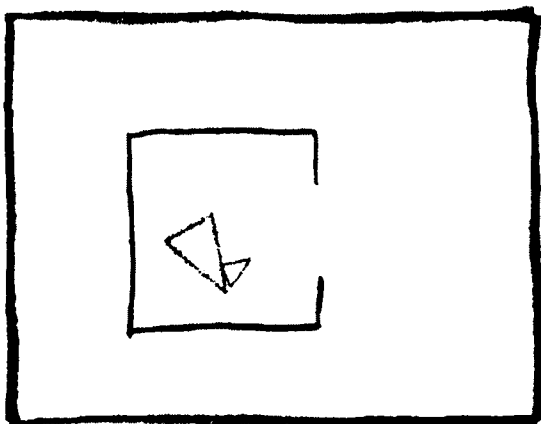
Control Condition:
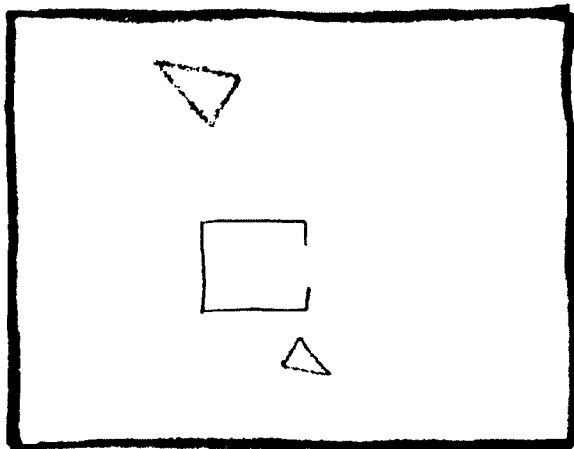
Appendix D

Instructions for the Linguistic Condition

Please watch the short animation clip twice. The research administrator will start the video during both viewings. Do you have any questions before we begin?

After you watch the video twice please answer the following questions:
(1) How do you think the Little Triangle feels at the end of the clip?
    (a) Proud
    (b) No feelings
    (c) Secure
    (d) Annoyed
    (e) Unsure

(2) How do you think the Big Triangle feels at the end of the clip?
    (a) Frustrated
    (b) Loving
    (c) Tense
    (d) Frivolous
    (e) No feelings

Appendix E

Semantic Differential Questionnaire for the Linguistic Condition

The following section aims at finding out about your ideas and impressions of the little triangle. All the items have pairs of opposites at each end, and between these there are 7 boxes. You are to place an "X" on one of the seven positions. Be sure to make only one check mark on each scale. In the following items please place your "X" rapidly. We are interested in your immediate impression. Remember, there are no right or wrong answers. The "right" answer is the one that is true for you.

The Little Triangle is...

Kind	☐	☐	☐	☐	☐	☐	☐	**Cruel**
Feminine	☐	☐	☐	☐	☐	☐	☐	Masculine
Selfish	☐	☐	☐	☐	☐	☐	☐	Cooperative
Outgoing	☐	☐	☐	☐	☐	☐	☐	Shy
Powerful	☐	☐	☐	☐	☐	☐	☐	**Powerless**
Desirable	☐	☐	☐	☐	☐	☐	☐	Undesirable
Escaping	☐	☐	☐	☐	☐	☐	☐	**Approaching**
Passive	☐	☐	☐	☐	☐	☐	☐	Active
Nervous	☐	☐	☐	☐	☐	☐	☐	**Controlled**

All the items have pairs of opposites at each end, and between these there are 7 boxes. You are to place an "X" on one of the seven positions. Be sure to make only one check mark on each scale. In the following items please place your "X" rapidly. We are interested in your immediate impression. Remember, there are no right or wrong answers. The "right" answer is the one that is true for you.

The Big Triangle is...

Kind	☐	☐	☐	☐	☐	☐	☐	**Cruel**
Feminine	☐	☐	☐	☐	☐	☐	☐	Masculine
Selfish	☐	☐	☐	☐	☐	☐	☐	Cooperative
Outgoing	☐	☐	☐	☐	☐	☐	☐	Shy
Powerful	☐	☐	☐	☐	☐	☐	☐	Powerless
Desirable	☐	☐	☐	☐	☐	☐	☐	Undesirable
Escaping	☐	☐	☐	☐	☐	☐	☐	**Approaching**
Passive	☐	☐	☐	☐	☐	☐	☐	Active
Nervous	☐	☐	☐	☐	☐	☐	☐	Controlled

Appendix F

Instructions for the Non-Linguistic Embodied and Control Conditions

Please watch the short animation clip twice. The research administrator will start the video during both viewings. Do you have any questions before we begin?

Now you will try replicating to the best of your ability the animation that you just saw. Please use these shapes and this board to move the shapes how they just appeared in the animation. You will not be rated on your accuracy of replication but please try to copy the movement of shapes in the animation to the best of your ability. Do you have any questions?

Overall, how accurate was your performance in replicating the animation?

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(Not accurate at all)   (Extremely Accurate)

Time (Seconds) Spent in Replicating the Video: _____

Appendix G

Script for the "Getting To Know You Induction Task"

You and the other participant will alternate by choosing from a list of questions concealed in an envelope. The questions are a way for each of you to get to know each other. You might be interested in asking follow-up questions based on your partner's response. Please refrain from asking additional questions that are not contained in the envelope.

We would like you to engage in as natural a conversation as possible using these questions. An easy way to do this would be to take turns asking and answering these questions. One participant will ask the other the first question chosen from an envelope. The other participant should answer and then ask that same question of the first partner. Both participants should ask and answer each question in the envelope. If for some reason you do not feel comfortable answering a question you can notify your partner that you don't feel comfortable and would like to pass on the question.

Before you randomly choose the questions from the envelope you will each answer these three questions: 1. What is your name? 2. Where are you from? 3. What year are you at LIU? (both participants will receive a paper with the three questions) as a way to introduce yourselves to each other. You will then alternate by choosing questions in the envelope.

When you are finished with the task you can open the door and I will come back into the room. If you need to speak with me at any point during the conversation I will be

in the classroom next door. Do you have any questions at the present time? If not, then

you can begin the task.

Appendix H

Questions in the Getting To Know You Task

What is your major? And why did you choose it?

What made you come to LIU?

What would you like to do after graduating from LIU?

If you could travel anywhere in the world, where would you go and why?

If you could change one thing about yourself, what would it be?

What is one of your biggest fears?

What is your happiest early childhood memory?

What is one recent accomplishment that you are proud of?

Tell me one thing about yourself that most people don't know.

Appendix I

Confederate Responses in the Getting to Know You Task

First 3 Questions:
What is your name?
Adam

Where are you from?
I was born in Boston, Massachussetts. I moved to New Jersey when I was very young and I lived there until last August when I moved to NY.

What year are you at LIU?
I'm a second year student at LIU.

Questions in the Envelope:
What is your major? And why did you choose it?
I'm majoring in psychology. I chose it because I've always enjoyed learning about people and understanding others. I also like helping people and this seemed like the best way of doing it.

What made you come to LIU?
LIU has a long history of being a diverse school, that is accepting of individual differences. I also found it to be unpretentious. And the location was really nice being in NY so I was close to my friends and my family in New Jersey. I really like my neighborhood in Brooklyn too.

What would you like to do after graduating from LIU?
I want to be a therapist or counselor. Either in a hospital or maybe start a private practice. And I'm also very passionate about teaching. So if I could to do both it would be great.

If you could travel anywhere in the world, where would you go and why?
Ooh that's a toughie. I've been to some really great places and I'm conflicted about going back or going to a new place. For some time I have wanted to explore Rome, Venice, and Madrid. One place I have wanted to go for a long time is Italy, so I think I'd pick that. In particular, I would love to see the Sistine Chapel and the School of Athens, because it's my favorite painting.

If you could change one thing about yourself, what would it be?

I think I'd like to be taller. When I was young I was picked on for being short. I feel like it limits me in terms of people's perceptions. So it would be nice to be taller. One can only dream.

What is one of your biggest fears?
That no one actually loves me. Or that they love me for what I can do for them or what I've accomplished. I think I'm most afraid of being rejected.

What is your happiest early childhood memory?
Well I'm having a hard time thinking of the earliest childhood memory. But my 3rd grade class was awesome. My third grade teacher, Mr. Schoch, was a character. We had a zoo in our 3rd grade class. We had 7 turtles, a shark, fish, a ferret, hamsters, and a boa constrictor named Gypsy. As an added bonus, the kid who was the best student of each week could feed Gypsy a mouse.

What is one recent accomplishment that you are proud of?
Surviving my first year of school. There was a ton of work. I had to pull 8 all-nighters during the first semester alone. I was taking a full course load and volunteering part-time at a hospital in Manhattan doing research. So it was definitely a very stressful year.

Tell me one thing about yourself that most people don't know.
Wow, these are some serious questions. Let me set the stage. I was in Paris with my girlfriend at the time. I wanted a picture in the King's chair at the Louve Museum. They preserved a certain area to be a royal house. The only thing between me and the chair was a one foot green velvet rope. And so I looked at my girlfriend. And she said, "don't do it." I asked her if she thought there was any laser beams. As soon as I made the leap toward the King's Chair, the alarms went off. I jumped back over the rope and the guards came. People started leaving in a single file line and we joined it as if nothing happened. After that I was very paranoid of running into a guard. I couldn't take the anxiety so we had to leave the museum. I don't think they're going to let me back in France.

Appendix J

Ratings of Perceived Intimacy and Levels of Self-Disclosure

**After the Getting To Know You Task, both the participant and confederate will fill out a short questionnaire assessing intimacy and self-disclosure scales based from the Getting To Know You Task.

Please indicate rate your experience of the interaction you just encountered. Use the 7-point scale provided below and darken the appropriate number for each item.

1. How well do you know the other person?

	1	2	3	4	5	6	7
	▢	▢	▢	▢	▢	▢	▢

(Not at all)   (Extremely Well)

2. How close do you feel towards this person?

	1	2	3	4	5	6	7
	▢	▢	▢	▢	▢	▢	▢

(Not close at all)   (Extremely Close)

3. What is the likelihood that you would want to develop a future friendship with this person?

	1	2	3	4	5	6	7
	▢	▢	▢	▢	▢	▢	▢

(Low Likelihood)   (High Likelihood)

4. Overall, how intimate would you describe the other participant's responses?

	1	2	3	4	5	6	7
	▢	▢	▢	▢	▢	▢	▢

(Not intimate at all)   (Extremely Intimate)

5. To what degree did the participant reveal **information** that you would consider personal?

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(Not Personal Information)   (Extremely Personal)

6. To what degree did the participant reveal **their feelings** that you would consider personal?

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(Extremely Impersonal)   (Extremely Personal)

7. How much **information** did YOU disclose to your partner?

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(Disclosed Little)   (Disclosed Lots)

8. How much did YOU disclose your **feelings** to your partner?

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(Disclosed Little)   (Disclosed Lots)

9. Overall, how would you describe the participant's responsiveness to your answers?

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(Not Responsive at all)   (Extremely Responsive)

Appendix K

Demographic Questionnaire

Please answer questions in the order asked.

Date of interview: ___ (Month) ____ (Day) ____ (Year)

1. Your Sex (M=0), (F=1) ____(DQ1)

2. In what country were you born

_____(DQ2)

3. If you were not born in the U.S., how old were you when you immigrated? _____ years. (DQ3)

4. In just a few words, please describe your ethnicity:

_____(DQ4)

5. Please check the line next to the description that most closely resembles your ethnicity. (DQ5)

    a. ___African   b. ___ African Caribbean   c. ___ Latino/a   d. ___ Western European

    e. ___ Native American   f. ___East Asian   g.___ South Asian h.___ Southeast Asian

    i. ___ Central Asian   j. ___ Eastern European   k. ___ Middle Eastern l. ___ Other (specify) _____

6. What is your native language? If you grew up speaking more than one language, list them all:

_____ (DQ6)

7. What language do you speak most often at home?

_____ (DQ7)

8. Current marital status: _____ (Please insert **ONE** of the numbers from the list below) (DQ8)

        (1)___ Married (legally)
        (2)___ Not married, but living together as a couple

(3)___ Divorced
(4)___ Widowed
(5)___ Separated
(6)___ Single, not living with a partner

9. Please describe your religion: _____ (DQ9)

10. Your age_____(DQ10)

11. Please check your **PERSONAL** income including salaries, wages, social security, welfare, and any other income. (DQ11)

(1)___ Less than $3,999   (6)___ Between $55,000 and $76,999
(2)___ Between $4,000 and 12,999   (7)___ Between $77,000 and $97,999
(3)___ Between $13,000 and $19,999   (8)___ Between $98,000 and $149,999
(4)___ Between $20,000 and $34,999   (9)___ Above $150,000
(5)___ Between $35,000 and $54,999

12. Indicate your **TOTAL HOUSEHOLD** income using the scale from question 6 (choose a number) ____ (DQ12)

13. Please check your highest degree obtained: (DQ13)

(1)   ___ No school or elementary school
(2)   ___ High school
(3)   ___ Community college or junior college
(4)   ___ Bachelor's Degree
(5)   ___ Masters Degree
(6)   ___ Doctoral Degree

Appendix L

Adult Attachment Questionnaire (AAQ) (Simpson et al., 1996)

Please indicate how you typically feel towards close relationships *in general.* Keep in mind that there are no right or wrong answers. Use the 7-point scale provided below and darken the appropriate number for each item.

1	2	3	4	5	6	7
□	□	□	□	□	□	□

(I strongly   (I strongly
disagree)   agree)

1. I find it relatively easy to get close to others.

1	2	3	4	5	6	7
□	□	□	□	□	□	□

(I strongly   (I strongly
disagree)   agree)

2. I'm not very comfortable having to depend on other people.

1	2	3	4	5	6	7
□	□	□	□	□	□	□

(I strongly   (I strongly
disagree)   agree)

3. I'm comfortable having others depend on me.

1	2	3	4	5	6	7
□	□	□	□	□	□	□

(I strongly   (I strongly
disagree)   agree)

4. I rarely worry about being abandoned by others.

1	2	3	4	5	6	7
□	□	□	□	□	□	□

(I strongly   (I strongly
disagree)   agree)

5. I don't like people getting too close to me.

            1   2   3   4   5   6   7

            ☐   ☐   ☐   ☐   ☐   ☐   ☐

(I strongly disagree)   (I strongly agree)

6. I'm somewhat uncomfortable being too close to others.

            1   2   3   4   5   6   7

            ☐   ☐   ☐   ☐   ☐   ☐   ☐

(I strongly disagree)   (I strongly agree)

7. I find it difficult to trust others completely.

            1   2   3   4   5   6   7

            ☐   ☐   ☐   ☐   ☐   ☐   ☐

(I strongly disagree)   (I strongly agree)

8. I'm nervous whenever anyone gets too close to me.

            1   2   3   4   5   6   7

            ☐   ☐   ☐   ☐   ☐   ☐   ☐

(I strongly disagree)   (I strongly agree)

9. Others often want me to be more intimate than I feel comfortable being.

            1   2   3   4   5   6   7

            ☐   ☐   ☐   ☐   ☐   ☐   ☐

(I strongly disagree)   (I strongly agree)

10. Others often are reluctant to get as close as I would like.

            1   2   3   4   5   6   7

            ☐   ☐   ☐   ☐   ☐   ☐   ☐

(I strongly disagree)   (I strongly agree)

11. I often worry that others don't really love me.

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(I strongly
disagree)

(I strongly
agree)

12. I rarely worry about others leaving me.

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(I strongly
disagree)

(I strongly
agree)

13. I often want to merge completely with others, and this desire sometimes scares them away.

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(I strongly
disagree)

(I strongly
agree)

14. I'm confident others would never hurt me by suddenly ending our relationship.

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(I strongly
disagree)

(I strongly
agree)

15. I usually want more closeness and intimacy than others do.

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(I strongly
disagree)

(I strongly
agree)

16. The thought of being left by others rarely enters my mind.

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(I strongly

(I strongly

disagree)   agree)

17. I'm confident that others love me just as much as I love them.

1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐

(I strongly   (I strongly
disagree)   agree)

Appendix M

Debriefing Script After Participating in the Study

I'll fill you in on the purpose of this research. This study is trying to gain a better understanding of the unique characteristics and thought processes of individuals that initiate a move toward thinking metaphorically and how those cognitive processes might subsequently impact intimacy and self-disclosure within an interpersonal encounter. By examining your unique characteristics of thinking metaphorically after viewing short animated clips of interacting shapes I was interested to see if these visual imagery tasks might impact your level of self-disclosure and perceived intimacy in an unrelated Getting To Know You Task with a new peer. Can I answer any questions you might have about this?

Also, I want to mention that the other participant in the Getting To Know You Task was a trained member of the research team, called a confederate, whose job it is to guide the interaction based on a script and evaluate the interaction. He is a graduate student in the clinical psychology department and his answers were determined before the study. His responses were based and reflected actual experiences in his life. He was trained to respond to the questions in a natural and genuine way. Do you have any questions or reactions at this point?

A copy of the addendum to the consent form will be given to participants. The reason that the addendum will be given at this time (rather than at the beginning of the study) is that the study is utilizing Adam Formal as a confederate. Mentioning his name at the beginning of the research would expose his position as a confederate in the project.

Sometimes in answering the questions in the study individuals have an emotional reaction to the themes discussed. Others gain a better understanding of themselves and develop insight into their own behavior, which sometimes prompts people to want to discuss the topics further with someone. There are many community facilities available to help alleviate emotional distress if you experience any in the future. One option is The Long Island University Psychological Services Center, which provides free and confidential personal counseling to students and support staff of the university. All services are provided by doctoral candidates in Clinical Psychology who are supervised by licensed psychologists. It is located in room L36 in the Pharmacy Building (around the corner from 3rd floor entrance to the library). To make an appointment, you can stop in or call 718-488-1266.

You may also call 1-800-LIFENET free of charge, 24 hours a day. This is a psychological services referral hotline that can help you locate the community facilities that may best help to alleviate your emotional distress.

Thank you for your participation in the study.