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The Effects of Physical Touch and Thermal Warmth on Interpersonal Trust

Rebecca Anne Parker
Indiana University of Pennsylvania

THE EFFECTS OF PHYSICAL TOUCH AND THERMAL WARMTH ON INTERPERSONAL TRUST

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Rebecca A. Parker

Indiana University of Pennsylvania

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Indiana University of Pennsylvania
School of Graduate Studies and Research
Department of Psychology

We hereby approve the dissertation of

Rebecca A. Parker

Candidate for the degree of Doctor of Psychology

_____ _____
David J. LaPorte, Ph.D.
Professor of Psychology, Advisor

_____ _____
Donald U. Robertson, Ph.D.
Professor of Psychology

_____ _____
Derek R. Hatfield, Ph.D.
Assistant Professor of Psychology

ACCEPTED

_____ _____
Timothy P. Mack, Ph.D.
Dean
School of Graduate Studies and Research

Title: The Effects of Physical Contact and Thermal Warmth on Interpersonal Trust

Author: Rebecca A. Parker

Dissertation Chair: David J. LaPorte, Ph.D.

Committee Members: Donald U. Robertson, Ph.D.
Derek R. Hatfield, Ph.D.

This study compares trusting behaviors and attitudes after participants are briefly exposed to physical contact, thermal warmth, or both. The interpersonal action was designed to be similar to a therapeutic setting. A 2 x 2 MANOVA was used to determine differences between experimental groups. Results from the study indicated non-significant differences between participants who received contact or warmth compared to participants in a no-contact or thermal cold group. Compared to previous studies, this study explored behaviors and attitudes during an interpersonal interaction over an extended period of time. The findings suggest that when considering building trusting relationships, brief contact with a warm object or brief physical contact do not contribute significantly in a prolonged interaction.

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CHAPTER 1

INTRODUCTION

Psychological research frequently aims to promote psychotherapy effectiveness and understand components that influence positive outcome. It is important to determine elements within the therapist, client, and therapeutic environment that enhance treatment effect components. While therapists can implement various theoretical techniques to lead to positive outcomes, studies have found that effects are more fully explained by the common components of therapy, specifically, what the client brings to session, the therapeutic alliance, and the expectations for outcome (Hubble, Duncan, & Miller, 2001). One could argue that trust is a contributing component within each factor. The issue of trust in the therapeutic environment is so important that guidelines and laws have been developed within the field of psychology to engender trust and prevent disclosure of information. As trust is recognized as an important component to improving therapeutic outcome, the current study will manipulate two variables, touch and thermal warmth, to explore the influence of each on trusting behaviors and attitudes. Past research has explored the effects of touch in a therapeutic environment and continues to be an area of controversy within the field (Bonitz, 2008; Durana, 1998; Horton, Clance, Sterk-Elifson, & Emshoff, 1995; Jourard & Friedman, 1970; Kertay & Reviere, 1993; Pattison, 1973;Willison & Masson, 1986). More recently, the influence of thermal warmth on behaviors and attitudes is emerging in psychological research (Williams & Bargh, 2008).

CHAPTER 2

REVIEW OF LITERATURE

Positive Outcome, Common Factors, and the Role of Trust

Research confirms that psychotherapy is effective. A meta-analysis of therapeutic inventions found that 70-80% of clients show significant benefits from therapy (Assay & Lambert, 1999). In addition, therapy has demonstrated lasting effects. Research conducted one to two years after termination of therapy found little decline in adaptive behaviors (Assay & Lambert, 1999). Psychotherapy is recommended as the optimal course of treatment, both alone and in combination with pharmacological intervention, for a number of psychological disorders due to the success indicated from conducted studies (APA, 2002). While it is clear that psychotherapy can be an effective intervention method for treating mental illness, it is important to understand what components enhance treatment effects. Studies have focused on the common factors of psychotherapy across theoretical orientations. The findings indicate that positive outcome is more greatly attributed to the aspects of therapy that are similar, rather than the specific technique implemented (Hubble et al., 1999). Components that were found to affect improvement include what the client brings to the session, the therapeutic alliance, initiating hope, and therapeutic technique (Hubble et al., Duncan, & Miller, 1999). The common factors that contribute to treatment effects are not mutually exclusive, and one could argue that trust is a key component to each factor.

Trust permeates each treatment factor of psychotherapy. Constructs of trust include both general trust and interpersonal trust. General trust is a belief that people are generally good or honest and interpersonal trust refers to trusting a relational partner in a specific

setting (Couch, Adams, & Jones, 1996). Trust in therapy is correlated with greater self-disclosure, suggesting additional behavioral changes when trust is increased (Corcoran, 2001). Research indicates that trust plays a role in developing interpersonal relationships, such as the therapeutic alliance, and in effective social functioning (Couch et al., 1996). Recognizing the importance of trust in psychotherapy has led to legally requiring client confidentiality in treatment (Corcoran, 2001). The significance of trust in each common factor of therapy will be discussed.

Of the four common factors found to lead to improvement in therapy, research has found it most beneficial for the client to recognize the ways in which he or she can contribute to success in therapy (Assay & Lambert, 1999). One client characteristic determined to affect outcome is the client's ability to trust (Corcoran, 2001). General trust can influence the client's ability to trust when entering therapy and can provide information about the client's social functioning outside of therapy (Couch et al., 1996). Greater trust is determined to increase client self-disclosure in therapy, leading to more positive outcome (Corcoran, 2001). Research indicates that clients who have a history of maladaptive interpersonal relationships and are distrusting and defensive in therapy report poor experiences in sessions and are at greater risk for continued distress (Assay & Lambert, 1999). Higher levels of trust in therapy can contribute to positive outcome, while inability to demonstrate trust can be detrimental for a client. It is important for the therapist to emphasize the contribution of the client. The client must trust the therapist and the therapeutic process. Considering how one can enhance the client's trust can increase the client's potential for success.

The therapeutic relationship, largely built on interpersonal trust, is another identified factor that contributes to positive outcome (Assay & Lambert, 1999). Moreover, it is the client's perception of the therapist that is important to building a strong relationship (Assay & Lambert, 1999). In addition to trustworthiness, studies indicate that clients desire a therapist who is warm, empathetic, accepting, honest, and respectful (Ackerman & Hilsenroth, 2003; Assay & Lambert, 1999). Interpersonal trust requires belief that the other will be responsive and caring. Hence, the therapist will benefit from understanding how to communicate a message of trustworthiness (Lahno, 2004).

Three components to the therapeutic relationship identified in research are; tasks, bonds, and goals (Assay & Lambert, 1999). A collaborative effort on completing tasks and identifying goals is found to be effective. Further, a need for positive interpersonal attachment between the therapist and client is described as important. The relationship demonstrates mutual trust, confidence, and acceptance. Therefore, the therapist will benefit by engendering a trusting relationship in order to develop a secure therapeutic relationship with the client.

Further, trust acts as a component to client expectations. A client who has hope and positive expectations for creating change in therapy is indicated to demonstrate significant adaptive outcome (Assay & Lambert, 1999). Therefore, the client must believe that improving in therapy is possible. A therapist can offer hope and increase a client's positive expectations by providing support and encouragement, accepting the client, and normalizing his or her experience. Therefore, a client's expectations can be influenced if the client is able to trust the honesty, intentions, and competence of the therapist.

The fourth factor that influences positive outcome in therapy is the therapeutic techniques implemented (Hubble et al., 1999). Trust is implicated in enhancing compliance with therapeutic techniques. Demonstrating trust involves risk and vulnerability for the client. Trust occurs when the client predicts a favorable response to his or her action (Lahno, 2004). When the client receives the desired reaction, he or she is rewarded for taking the risk, thus engendering greater trust. For example, an individual with anxiety who is required to adhere to exposure therapy must feel safe in the treatment environment and trust that the treatment will lead to positive change. Further, as the client begins to experience success in therapy, he or she is rewarded for the trusting behavior, which in turn leads to greater trust and further success.

Review of past research provides evidence that common factors of therapeutic intervention lead to treatment effects. Consistent across theories is what the client contributes, the therapeutic relationship, and client hope for improvement through psychotherapy. The specific technique implemented contributes to outcome as well. The factors can be improved by increasing trust in the therapeutic environment. Therefore, it is important to understand how to enhance trust in therapy. Existing research indicates that physical touch and thermal warmth are two ways to engender interpersonal trust. For the purposes of this paper, thermal warmth will be referred to as "warmth" and should not be confused with personal warmth of the individual, such as acting as an empathetic listener. In this paper, warmth indicates contact with a warm object, such as a coffee cup or heating pad. This study will explore the effects of physical contact and warmth further and offer research on the role of Oxytocin and trust as a possible explanation.

Trust and Early Development

Trust is composed of behavioral, cognitive, and affective elements (Lahno, 2004). Research indicates that elements of trust are enhanced by both touch and thermal warmth. First understanding how both contribute to lifespan development and wellbeing is beneficial in recognizing the role touch and physical warmth plays in interpersonal trust. Warmth and physical contact are important elements in establishing a healthy mother-infant attachment (Williams & Bargh, 2008). Well-known research by Harlow (1958) posited that contact comfort was an essential component to mother-infant attachment and the health of the infant. In research, Harlow observed the behaviors of infant monkeys to better understand attachment behaviors, physical development, and emotional adjustment. The study explored the primary needs of the infant (e.g., food) compared to the secondary needs (e.g., nurture) in attachment development. The monkeys were provided a surrogate mother composed of a wood block covered in wire. The surrogate mother provided milk to the infant. Also in the cage was a wood block surrogate mother covered in terrycloth that represented a soft, warm, and tender mother. Further, the monkey had a light to radiate heat but did not provide food. Through measurement of time spent with each surrogate mother, Harlow observed that the monkeys chose to spend considerably more time with the terrycloth monkey, turning to the wire monkey only for provision of food.

In addition, Harlow designed a condition in which the monkeys were exposed to either the wire surrogate or the cloth surrogate, with both providing nutritional nourishment. He found that consumption of milk and weight was equivalent in both groups of monkeys. However, the monkeys in the wire condition demonstrated intestinal distress, suggesting psychosomatic implications when deprived of contact comfort. In

addition, behavioral differences are noted in infant monkeys provided comfort from those that did not. Harlow observed acting-out behaviors and distress during a novel event in the monkeys deprived of comfort. The monkeys receiving comfort responded to the environment by exploring the environment and returning to the mother, using the surrogate as a secure base. The studies by Harlow indicate the benefit of contact and warmth in infant development and emotional and physical health.

Infant research on touch and development in human infants followed, through work by Bowlby and Ainsworth on mother-infant attachment (Durana, 1998). More recent research in neuroscience supports the contribution of biology and social environment in development of interpersonal bonds (Insel & Quirion, 2005). Humans reportedly have an innate, motivating drive to seek and maintain contact with significant others (Johnson, 2001). Attachment research has aimed to understand how early attachment affects relationships during childhood, adolescence, and adulthood. Findings indicate that positive attachments create a secure base by creating safety and comfort (Johnson, 2001). Development of healthy attachments can encourage the belief that others are worthy of trust in future interactions. Therefore, the strength of the bond can influence how one perceives others and affect behavior patterns. Although attachment can influence future relationships, attachments are continually constructed and can adapt with positive interpersonal interactions (Johnson, 2001; Insel & Quirion, 2005). Moreover, studies are gaining greater knowledge and understanding in identifying the neural pathways and mechanisms that are implicated in social interactions (Insel & Quirion, 2005). Altering relational patterns can lead to development of new neural pathways (Insel & Quirion, 2005). Therefore, while contact and thermal warmth can contribute to secure attachments

early in life, there exists potential to develop adaptive relationships through future interactions. Research in neuroscience can improve our understanding of interpersonal experiences, including emotions and behaviors, in turn leading to better psychosocial intervention methods (Insel & Quirion, 2005). In addition to influencing early bonding behaviors, touch and thermal warmth assist in relational interpretation by providing environmental cues. First, our reliance on sense of touch to communicate with others will be discussed (McGlone,Vallbo, Olausson, Loken, & Wessber, 2007). Touch provides information about the state of our body, leading to interpretation of stimuli as either rewarding or aversive, indicating an interoceptive role of touch (McGlone et al., 2007).

Touch

A study by McGlone et al. (2007) suggests that we use environmental stimuli to determine trust. Studies designed to explore how touch can influence trusting behaviors, and behaviors correlated with trust, indicate that touch can enhance levels of trust in social interactions, including the therapeutic relationship. When examining the effect of touch on trust, operationally defined as including helping behaviors, generosity and altruism, and positive evaluations of others, studies found that participants who receive touch are more likely to comply with tasks, rate the interviewers favorably, and report positive feelings, compared to control groups (Fisher, Rytting, & Hessling, 1976; Gueguen, 2004; Hornik, 2001; Nannberg & Hansen, 2001;). The studies indicated that brief physical contact between strangers increased trusting attitudes, regardless of conscious awareness of the physical contact (Fisher et al., 1976). In the study by Fisher et al. library clerks were instructed to touch the hand of some patrons when returning their library card. Those

touched were more likely to report positive feelings and rate the clerk more favorably. Further, those touched were often unaware of the physical contact.

In a similar study of touch and compliance, participants were asked to complete a questionnaire by an interviewer. The experiment involved a touch and no-touch group, with touch consisting of a brief contact with the participants' hand, arm, or shoulder. Those who were touched answered significantly more items on a questionnaire and were significantly more likely to complete the entire survey compared to participants who were not touched (Nannberg & Hansen, 2001). A study on the effects of touch and compliance in a university classroom setting found that students who were touched by their professor while completing a problem were more likely to volunteer for a second task at the board than those students who had not been touched (Gueguen, 2004). In a study by Erceau and Gueguen (2007), researchers evaluated the effect of a brief touch to the forearm by a salesman attempting to sell a car. A researcher then asked the participant to rate the seller on friendliness, honesty, sincerity, agreeableness, and kindness. Participants who had received a brief touch rated the seller more favorably compared to the no-contact group with effect size ranging from $d = 1.37$ to $d = 2.56$. In a 2009 study conducted by Gueguen and Vion, the effect of touch on medication compliance was evaluated. Compared to a no-contact group, participants who were briefly touched on the arm were found to have taken more medication at follow-up, eight days later.

The studies provide support for the implementation of touch in interpersonal interactions. However, inconsistencies in research findings are noted. A study in which participants were exposed to both touch and eye gaze found lower levels of helping behaviors than those who were either touched or exposed to eye gaze (Goldman &

Fordyce, 1983). Participants may have felt the interaction with a stranger was too intimate, leading to greater apprehension in participation. Further, it is important to understand how gender may affect outcome. Inconsistencies in the research are observed with compliance in males and females and gender of the interviewer, while other studies do not consider the role of gender. Fisher et al. (1976) found increased compliance in female participants, regardless of interviewer gender. Both physiological and social implications may interfere with responses of males and females following touch in interpersonal interactions. While there is some evidence to support the influence of touch on trusting behaviors, inconsistencies in findings are observed. Consideration of touch in a clinical setting requires careful review of both positive and negative implications.

Studies exploring the use of touch in a therapeutic context are limited. Pattison (1973) explores the use of touch in therapy on client self-exploration and perception of the therapeutic relationship. The study compared touch and no-touch groups and used observation methods to determine level of self-exploration. Self-report measures of clients' perceptions of the therapist, and therapists' feelings toward the client were also included in the study. Significant findings suggest an increase of self-exploration but not a greater positive perception of the relationship (Pattison, 1973). The findings may be due to differences in behavior and self-reports of attitudes. This is consistent with findings that suggest that participants may not be aware of the influence of touch on trust.

A study designed to evaluate genuine interactions of touch between therapist and client was conducted to evaluate clients' perceptions of the therapists' use of touch (Horton et al., 1995). Previous studies on touch in therapy had been in an experimental setting. The aim of the study by Horton et al. was to understand the implications of touch

when used in a natural therapeutic context. Participants were recruited through clinics, community centers, self-help groups, and counseling centers. The researchers targeted individuals who had participated in individual therapy for at least two months in the last two years and had experienced either positive or negative touch by the therapist. Individuals were mailed questionnaires and informed of confidentiality and anonymity of responses. The survey included measures of client and therapist bond, agreement on goals of client and therapist, and agreement on tasks in therapy. Of these, the study found a significant correlation between positive evaluation of touch and strong therapeutic bond, a relationship that accounted for 11% of the variance. Further, the researchers asked open-ended questions and analyzed participant responses. They found two main narrative themes for those who reported positive experiences with touch by the therapist. Of the full sample, 69% of respondents reported that touch created a bond of closeness, facilitating trust and openness in the session. Forty-seven percent of the participants also reported that the touch helped them to feel accepted by the therapist, improving their self-esteem. Overall, the study found that clients who reported a positive response to touching felt safe and supported, enabling discussion of difficult topics and deeper emotional content. Of the 231 respondents, ten reported negative response to touch from a current therapist, finding it either didn't meet their needs or stating that they interpreted the therapist to be uncomfortable with touch. Thirteen percent of respondents reported past experiences with therapists where they interpreted touch as uncomfortable or sexual in nature (Horton et al., 1995). The study required that participants had completed at least two months of therapy so this may be an underestimate of negative experiences in therapy. Clients who had

experienced uncomfortable touch would be more likely to terminate therapy before a two-month period.

Reviews of research on the use of touch in therapy have been conducted. One review found that touch leads to more positive evaluations of the therapist and greater perceptions of expertise in the therapist, therefore enhancing the therapeutic process (Willison & Masson, 1986). The findings indicate that clients have greater levels of self-disclosure. The authors argue that avoidance of touch by the therapist can lead to depersonalization of the client, inhibiting development of the therapeutic relationship (Willison & Masson, 1986). In a review of research on touch by Kertay and Reviere (1993), the authors argue that touch is important and pervasive in human communication. They provide a review of literature on the need for touch in human development and propose that therapists should not question if touch "should" be used but rather "how" it can be used in the therapeutic process. While an argument exists for including touch in therapeutic techniques, opposing views are evident and response has included development of legal and ethical guidelines.

The Controversy of Touch

Although research exists that indicates positive outcomes from inclusion of non-erotic touch in psychotherapy, it is a subject of past and current controversy. Studies exploring therapist use of non-erotic touch in psychotherapy have ranged in prevalence of reported touch from 10-100% (Bonitz, 2008). The differences in findings are due to various populations studied and differing definitions of touch. It is clear that there are diverse views on how to define physical touch and whether contact should be included in therapy. Bonitz (2008) found therapist consensus regarding shaking the hand of the client.

Therefore, for the purposes of this study, a handshake will serve as physical contact. The aim of this study is not to side in the debate but to explore physical contact that is socially normative. The interest is in understanding how subtle environmental cues can enhance therapeutic effects. For those therapists considering physical contact beyond the methods used for the current experimental design, it is recommended that the following guidelines and contraindications be observed due to the ethical issues involved.

First, adherence to the APA ethical principles, including responsibility of the therapist, protection of the welfare of the consumer, and compliance with the moral and legal standards of the community, is necessary (APA, 2002). Therapists can determine a clear definition of touch, with an emphasis on nonerotic contact, in the context of therapy to aid in limiting controversy (Kertay & Reviere, 1993). The authors argue that guidelines regarding touch can include; (a) touch that is appropriate to the situation, (b) touch that does not impose a greater level of intimacy than the client can handle, and (c) touch that does not communicate a negative message (Willison & Masson, 1986). Further, to allow greater trust, an established relationship between the client and therapist is recommended before including touch (Willison & Masson, 1986; Wilson, 1982). Finally, contraindications to the use of touch in therapy are outlined by Older who maintains that touch should not be used; 1) if the therapist is not comfortable with touch, 2) if the therapist senses the client does not want to be touched, 3) when the therapist feels touch would not be an effective technique in the therapeutic process, and 4) when the client is believed to feel manipulated or the therapist is aware of intentions to coerce the client through touch (Horton et al., 1995). While the study posits that a handshake may suffice

in enhancing trusting behaviors, similar outcome is expected with exposure to tactile warmth.

Thermal Warmth

Although past research on the influence of various external stimuli, like touch, continues to be a topic of controversy, a newly emerging area of research on the effects of thermal warmth suggests similar effects on trusting behaviors (Williams & Bargh, 2008). Further, the altered feelings and actions from the thermal warmth are found to be unconscious and outside of the participants' awareness (Williams & Bargh, 2008). New research in this area indicates that tactile contact with warm objects influences attitudes and behaviors of trust (Williams & Bargh, 2008).

Our social perception, judgment, and behaviors can be influenced by external stimuli, including touch and warmth, outside of our awareness (Nosek, 2007). Evidence of this phenomenon was first provided in research findings by Asch which demonstrated that participants provided personality descriptions of others as either "warm" or "cold" were influenced in their social perception of the individual. More recent research on priming effects modeled after the Asch study provides participants with positive and negative adjectives and then asks for an evaluation of an individual, finding that exposure to the words influences the ratings, with positive adjectives leading to better evaluations (Bargh & Chartrand, 1999). Similar findings are noted when primed with stereotypes for the elderly or academic success, with participants moving more slowly and demonstrating poor memory or performing better on achievement tests. Further, studies have found a tendency for participants to mimic the facial expressions, vocal tone, and movements of a confederate. When the confederate copied the behaviors of the participant, the confederate

was rated more favorably by the participant, providing further support for the influence of external stimuli in interpersonal interactions (Bargh & Chartrand, 1999). In addition, priming experiments have explored the effects of spatial distance on psychological distance, with greater distance resulting in descriptions of weaker attachment with family members (Williams & Bargh, 2008). When participants asked to rate the interviewer, the participants exposed to less distance reported more positive feelings toward the experimenter, such as feeling at ease, feeling understood, greater experimenter trustworthiness, feeling liked by the experimenter, and overall satisfaction (Jourard & Friedman, 1970). Findings from research on priming effects influenced current research on the use of warmth as a primer for trusting behavior. Recent studies posit that tactile warmth would act similarly to exposure to adjectives of interpersonal warmth and prime the participant to view others as kind, genuine, and trusting, without conscious awareness of the influence of the external stimuli (Williams & Bargh, 2008).

To determine if warmth would have an effect similar to other studied priming stimuli, researchers asked participants to assist the experimenter by holding either a warm or cold coffee cup. Participants were later asked to rate personality traits of the experimenter. The study found that those who had held the warm cup were significantly more likely to rate the experimenter more positively on the warm characteristics dimensions of the scales (Williams & Bargh, 2008). In a second study, participants were asked to hold either a warm or cold pad and told they would be asked to evaluate effectiveness of the pad. When they were offered a choice between a personal reward or gift for a friend, those who held the warm pad were significantly more likely to choose the

gift for a friend, suggesting greater interpersonal warmth in their behavior (Williams & Bargh, 2008).

While the influence of thermal warmth on social judgment and behavior is a recent discovery, the underlying mechanisms are similar to past research that indicates the effects of external stimuli on swaying perceptions and actions. In each study reviewed, the activity has an element of unconscious influence on the participant. The effects can be described through the underlying physiological mechanisms that are activated through the contact with warmth. Further, the mechanisms are similar to participants' response following touch, suggesting that trust is engendered through each in a similar fashion. Although not the focus of this study, the release of Oxytocin (OT) through physical and thermal contact is offered as a possible explanation as OT has been found to play a role in trusting attitudes and behaviors. The research on OT will be discussed below.

The Role of Oxytocin

Recently, exploration of neurobiological states has led to greater understanding of how physiological mechanisms can enhance attachment and prosocial behaviors (Carter, 1998; Insel, 1997). The neuropeptide Oxytocin is implicated in the findings. Historically, OT has gained considerable attention for the role in lactation during breastfeeding and uterine contractions during labor. More recently, OT has been recognized for its activity within the brain and brainstem. Oxytocin is a nine-amino-acid peptide synthesized in the hypothalamus. It is released into the blood stream through axon terminals located in the posterior pituitary. Receptors have been located throughout the brain. The integration of research findings indicates support for the role of OT in social interactions (Carter, 1998; Insel, 1997; Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005; Zak, 2003; Zak,

Kurzban, & Matzner, 2004; Zak, Stanton, & Ahmadi, 2007). Moreover, research indicates that OT is released through pleasant activities, such as physical contact or contact with warm objects (Uvnas-Moberg & Inst, 1998; Zak et al., 2004). OT receptors are distributed in areas of the "social brain." These areas of the brain control emotions and behaviors. Receptors have been identified in the amygdala. OT is found to reduce amygdala activity, leading to less stress and decreasing avoidance behaviors (Zak et al., 2007). The automatic nervous system regulator, the hypothalamus, is implicated. This provides support for the hypothesis that OT can influence behavior without an individual's conscious awareness. Further, findings indicate that release of OT influences social behavior by activating release of dopamine, the neurotransmitter involved in experiencing reward and reinforcement (Zak et al., 2004; Zak et al., 2007). The nucleus accumbens and ventral tegmental area of the brain are noted to respond to OT, leading to expectation and receipt of reward, making social interactions rewarding for an individual (Krueger et al., 2007; Zak, 2003; Zak et al., 2004). Findings suggest the social brain has many connections to areas of the brain responsible for attention and to the anterior cingulate cortex, which plays a role in scanning the environment for anomalies. The network includes the prefrontal cortex, responsible for executive functions, such as decision-making (Zak, 2003). Therefore, the judgment to trust is automatic, intuitive, and unconscious in many cases (Zak, 2003: Carter, 1998; Baumgartner, Heinrichs, Vonlanthen, Fischbacher, & Fehr, 2008). Using fMRI imaging, Winston et al. (2002) found that a task of trustworthiness activates the amygdala, orbitofrontal cortex, fusiform gyrus, and superior temporal sulcus (STS), areas consistent with OT receptor locations (Winston et al., 2005).

Moreover, research finds that lesions in areas of OT receptors lead to greater difficulty in determining trustworthiness of others (Zak et al., 2004).

Research to explore neural pathways and the role of OT in animals has significant implications for understanding human social behaviors (Insel, 1997). Individuals require mechanisms to determine whether to approach or retreat from an interaction (Winston et al., 2002). Thus, neurological processes must be able to determine the trustworthiness of others. Although animal research is limited due to the absence of pair bonds in most animal species, the prairie vole manifests components of monogamy similar to human relationships. The rodents have been found to form a lasting breeding pair, with frequent contact noted. The pair shares a territory and rejects unknown prairie voles. Further, both male and female voles participate in care of offspring. Of additional importance is the consistency in social behaviors observed by the prairie voles in the laboratory environment. Moreover, comparative studies are possible with the montane vole. The montane vole is similar in many features to the prairie vole, however does not demonstrate pair bonding or continued parental care. Comparative studies between the two types of voles have indicated differences in oxytocin receptor distribution in the brain (Insel, 1997).

Animal studies find that female prairie voles release oxytocin while mating (Insel, 1997). Laboratory observations have indicated pair bonding behavior following mating in the prairie vole. To further explore the role of oxytocin, female voles were given injections of oxytocin and the behavior of the vole was observed when introduced to a male vole when no mating behavior had occurred. The female vole demonstrated similar behavior following the administration of OT as she had following mating. Moreover,

when an oxytocin antagonist was administered, the voles continued to participate in mating behavior however did not demonstrate pair bonding behavior. The studies demonstrate that in female prairie voles, oxytocin released during mating is both necessary and sufficient for attachment development (Insel, 1997). In addition to research on OT in animal studies, the role of OT has been studied in humans with findings, consistent with animal research, implicating OT in engendering trust. Levels of OT in the blood have been measured following activities involving trust (Zak, 2003). Additional studies have administered OT intranasally to observe differences in perceptions and behaviors (Zak, 2004, Kosfeld et al., 2005). Further, fMRI studies allow researchers to explore how OT is released, what areas of the brain are activated, and how OT enhances trust.

In initial studies with human participants that evaluated the role of OT in engendering trust, blood samples were taken and levels of OT in the blood were measured, following the "Investment Game" to determine how a trusting gesture would impact behavior (Zak, 2003). The study found that higher levels of OT were correlated with individuals who had been trusted by the other participant. Further, the perception of being trusted enabled trusting behavior. The findings suggest that a therapist can increase trust in a therapy session by demonstrating trust of the client. The studies indicate that it is the release of OT, not the baseline levels of OT, that influence behavior, indicating that social contact is necessary to release OT (Zak et al., 2004). The authors argue that OT acts as a switch that allows judgment of trust to occur through touch, warmth, safe environments, or a signal of trust (Uvnas-Moberg, 1998; Zak et al., 2007). Moreover, people are quickly able to categorize an individual as trustworthy, but are unable to articulate what led to assigning the attribute. OT activates the parasympathetic nervous system to communicate

that the environment is safe. Therefore, the decision-making regarding trust is outside of the participant's awareness (Zak, 2003). This is congruent with Bargh's findings on warmth.

In addition to an observed increase of OT in blood levels, studies find the administration of OT increases trust in human interactions (Kosfeld et al., 2005, Zak et al., 2004). In one study measuring trusting behavior, the experimental group was administered OT intranasally (24IU) and a placebo group was administered a saline solution 50 minutes before the start of the experiment (Kosfeld et al., 2005). Trust was measured using a game with monetary risks. The study compared social risk with monetary risk to differentiate between trust and risk-taking behavior. The study found a statistically significant difference in both the number of individuals who demonstrated trusting behavior (transferring money) and in the level of trust (amount of money transferred) for the OT group, compared to the placebo group. The study also indicates that the participants demonstrated trust although they did not have face-to-face or verbal interaction in the experimental set-up. This suggests the strength of OT in influencing social trust. In a similar study, Zak et al. (2004) found that those participants administered OT intranasally demonstrated significantly greater levels of trusting behavior than the placebo group. The study found that 2% of participants exposed to OT did not show trust. This could suggest dysfunction or lack of OT receptors. Those same participants were found to endorse antisocial behaviors in a measure of personality characteristics (Zak et al., 2004).

In a study by Baumgartner et al., (2008) administration of OT was found to increase social risks in interpersonal interactions, but not general risk-taking behavior. The double-blind study of OT administration and placebo was designed to determine how OT

was implicated when responding to feedback of distrust. Neural networks were examined with fMRI. Greater activation was observed in the placebo group in the amygdala, midbrain, and striatum. As previously discussed, OT has been found to reduce activity in these areas, suggesting safety in approach behaviors. Behaviors for both groups were found to be the same during the risk game when participants were provided knowledge that their partner was trustworthy. After providing feedback that the participant could not be trusted, those administered OT did not adjust their behaviors, while the placebo group adapted to the feedback. The OT group continued to perform in a trusting fashion, without explicit awareness of their behavior (Baumgartner et al., 2008). This is consistent with findings that OT works automatically and without conscious awareness.

Summary

Trust is an important component in individual and social functioning. Psychotherapy provides a unique environment where the constructs of general and interpersonal trust are particularly salient. The level of trust in therapy can play an influential role in each of the common factors indicated to engender positive treatment effects. Although physiological and environmental influences can contribute to trusting behaviors and attitudes during development, patterns in interpersonal relationships can be altered through interactions across the lifespan. Recent research suggests that simple external stimuli, such as physical touch and tactile warmth, can engender trust during such interactions, leading to more positive social relations and reinforcement for the exchange. Research on OT, which is released through physical contact and warmth, indicates an underlying physiological role of the neuropeptide in engendering trust. The effects of physical touch within a therapeutic context have been examined, however the definition of

contact remains unclear and findings are inconsistent. Further, the role of warmth on trust is an emerging field that has not been directly linked to psychotherapy. This study will explore the effects of a clearly defined and socially normative form of physical contact during an interview. The format is designed to be similar to the therapeutic environment. In addition, the study will expand upon the recent thermal warmth research to observe trusting behaviors and attitudes in a similar interview format. The study hypothesizes that both physical touch and thermal contact will engender trust during the interview.

CHAPTER 3

METHODS

Participants

Data were collected from 107 female participants selected through the university psychology subject pool. The sample size was determined using a power analysis for a small to moderate effect size based on previous research findings. Table 1 below provides results from the power analyses.

Table 1
Power Analyses

Sample Size	Effect Size	Power
107	.4	.98
107	.25	.73
90	.5	.99
90	.3	.82
90	.1	.17

However, data were analyzed from only 94 from the original 107. Ten participants' data could not be used due to issues with recording. Two interviews were used to determine interrater reliability following problems with a scheduled interviewer. One participant's data were not used after she refused to shake the interviewer's hand, stating that she was ill. Further, she was limited in her responses due to illness, affecting her total number of disclosures. Once participants were identified from the subject pool they were contacted by the primary researcher via email and were scheduled. The interviewer described the study using a standard script (Appendix A) and all participants were provided written informed consent (Appendix B) before the start of the study.

Procedures

Experimental Conditions

The total time commitment from participants was 20 to 30 minutes, which included one appointment broken into two sessions: the first with Interviewer A and the second with Interviewer B. Participants were randomly assigned to one of four experimental conditions; 1) touch and thermal warmth, 2) touch and thermal cold, 3) no touch and thermal warmth, and 4) no touch and thermal cold. Differences in procedures for experimental conditions occurred during the initial greeting and in the temperature of the thermal pack provided prior to a distracter task. For those participants in the touch experimental conditions (Condition 1 and Condition 2), Interviewer A extended her hand to offer a handshake while greeting the participant. With contact, Interviewer A placed her non-dominant hand over the participant's hand, holding the participant's hand between her two hands and shaking the participant's hand for two seconds. In the no-touch conditions (Condition 3 and Condition 4), Interviewer A held a clipboard and other materials to make a handshake impossible. The second difference in protocol, the thermal condition variable required participants to hold a hot or cold pack for two seconds. Participants in a thermal warmth condition (Condition 1 and Condition 3) were asked to hold a commercially available warm gel pack (135°F) that was continuously heated by a heating pad when the pack was not in use. Participants in the thermal cold group (Condition 2 and Condition 4) were asked to hold a commercially available cold gel pack (35°F) that had been kept in the freezer and traded out as needed to maintain a cold temperature. Data were collected in April 2010, October 2011, and one day in November 2011. A chart with the mean outdoor temperature for each day of data collection is provided (page 25).

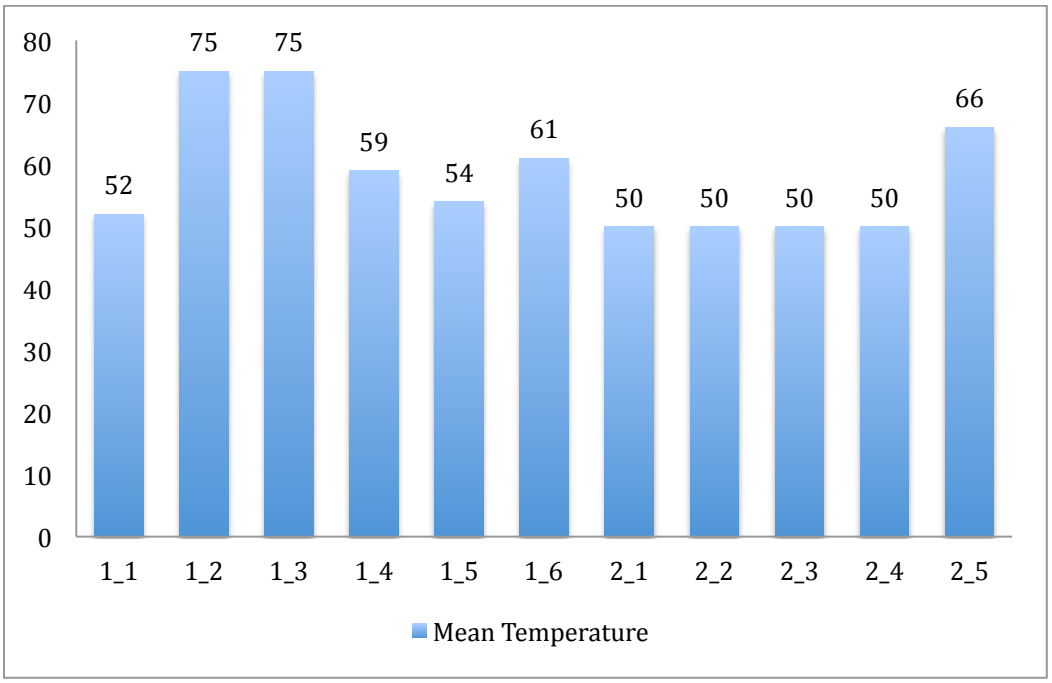

Figure 1. Mean outdoor temperature.

Session A

For all participants, Interviewer A, a female interviewer, greeted each participant. Interviewer A was one of four trained, female, doctoral student volunteers interested in gaining research experience and blind to the research hypotheses. The interviewers were female to limit influence of experimenter gender on outcome. Previous studies have found inconsistent results when gender effects were explored. Further, this study required a large sample size in order to detect a small effect size. Therefore, it was deemed impractical to explore interviewer gender on outcome effects. Interviewers were provided a script for data collection. The primary researcher conducted the training on treatment condition protocols, distracter task administration, and interviewing procedures. Before meeting with participants, the interviewers were required to perform a mock interview to ensure standardization of protocol for each condition. Reading from a script, Interviewer A

described the study as an exploration of the relationship between motor speed and verbal fluency. She explained the steps involved, including the recording of the session, and the time commitment required (Appendix A). Interviewer A asked each participant to hold either a hot pack or cold pack (depending on the assigned treatment condition as described above) for two seconds in her non-dominant hand. Participants were told the reason they would be holding the pack was to determine if the temperature affected their motor speed or rate of speech. Next, a distracter task, The Trail-Making Test A and B was administered. The task involves the connecting of randomly arrayed numbers on a page, or alternating connecting between numbers and letters, respectively. Participants were instructed to complete each trial as outlined in the standardized administration. Each trial was timed, but the tests were not scored and no data from the task were used for this study. (See Appendix C for instructions.) The table below indicates Condition distribution amongst the four interviewers.

Table 2
Condition Distribution

Interviewer	Condition 1	Condition 2	Condition 3	Condition 4
One	17	15	16	16
Two	2	7	5	3
Three	3	2	3	1
Four	2	0	0	2

Interview

After engaging in the bogus motor speed task, participants were told they would be asked questions about their personal life in order to measure their rate of speech while talking about familiar information. Interviewer A then conducted the interview (Appendix

D). The interview was a structured questionnaire consisting of closed and open-ended items ranging in degree of how "sensitive" the question was (Joinson, Paine, Buchanan, & Reips, 2007). Additional items were added to include a wider range of neutral to sensitive questions. Examples of questions included "How old are you," "What are your favorite things to do in your free time," "What are some things you hate about yourself," and "What are some things that really hurt your feelings?" This approach follows constructs of disclosure outlined by Collins and Miller (1994). Interviewer A did not respond verbally or with non-verbal responses such as nodding or smiling during the interview. Following the interview, Interviewer A escorted the participant to a second room to meet with Interviewer B, taking care to avoid further tactile contact with the participant. The primary researcher acted as Interviewer B for all participants, and was blind to the experimental condition.

Session B

To measure each participant's trusting attitudes toward Interviewer A, Interviewer B asked the participant to rate Interviewer A's performance during the experiment using two self-report measures described below. Interviewer B stated that the participant responses would be confidential and would not be linked to a participant (Appendix E). The participant then answered two forced-choice questions. First, they were asked if they shook hands with Interviewer A to assess contact awareness. Next, participants were asked if they were concerned about the swine flu or germs in general in order to determine if participants experienced a negative reaction to contact that would influence results. This was done because the swine flu outbreak was at its peak at the time of the study design

(Appendix H). Participation concluded with a full debriefing by Interviewer B (see Appendix I).

Dependent Variables

Trusting behaviors and attitudes were measured using five dependent variables. From the interview, three variables including the total number of participant disclosures, the time that the participant talked, and the level of intimacy of each disclosure were operationally defined as trusting behaviors. In an effort to minimize error due to poor sound recording, the primary investigator and one trained research assistant transcribed the recorded interviews. To increase consistency in measurements of time of disclosures and total number of disclosures, the primary investigator determined both while blind to the treatment condition. Judges of level of intimacy were trained, undergraduate volunteers interested in gaining research experience. The primary investigator conducted level of intimacy training. The training described self-disclosure levels of intimacy and rating procedures. A 5-point Likert scale, ranging from low intimacy to high intimacy, determined depth of each disclosure. Practice interviewer-response scripts were used to assure skill mastery. Three judges were used to rate the level of intimacy of each disclosure. The mean for each item was used for data analysis. Interrater reliability using intraclass correlation before coding data was .80, indicating a high level of reliability (Field, 2009). Intraclass correlation on 10% of the completed data was .95, indicating an excellent level of interrater reliability (Field, 2009).

Two dependent variables were used to assess participants' trusting attitudes: the Emotional Trust Scale (Appendix G) and the Empathy Scale, Client Version (Appendix H). The Emotional Trust (ET) Scale was designed to measure levels of trust for a

particular other (Johnson-George & Swan, 1982). The Emotional Trust Scale is a subscale of a measure in which response items were generated through discussion and literature review. Fifteen judges rated the 50 initial items for importance in determining components of trust. Factor analysis was conducted for the 43 items with the highest inter-rater agreement and distinct types of trust were identified for males and females. Coefficient alphas for the subscales range from .71-.83. The ET scale assesses components of trust consistent with desired characteristics of the therapeutic relationship. The ET subscale is a self-report measure with eight items, using a 9-point Likert scale, ranging from "Very Strongly Agree" to "Very Strongly Disagree" (Johnson-George & Swan, 1982). A large number of participants expressed confusion after reading the first item of the Emotional Trust item and the item was discarded from the measure to reduce error. After deleting item number one, the Cronbach's alpha for this study was .79, suggesting a high level of reliability given the number of items on the scale (Field, 2009).

The Empathy Scale, Client's Version is a 10-item, self-report measure with responses ranging from "Not at all" to "A lot" on a 4-point Likert scale (Burns & Nolen-Hoeksema, 1992). High ratings on the first five questions indicate greater empathy, while high scores on the last five questions suggest low levels of perceived empathy. To score the scale, the first five items are added, while the last five are subtracted. Total scores range from -15 to + 15, with higher scores indicating greater empathy (Burns & Nolen-Hoeksema, 1992). For this study, the last five items were reverse scored and a total score was used for analyses. In this study, the Cronbach's alpha coefficient was .77, suggesting high reliability for the ten items.

CHAPTER 4

ANALYSES

A two-way between-groups multivariate analysis of variance was performed to investigate the effects of physical contact and thermal warmth on trusting attitudes and behaviors. Five dependent variables were used: the Empathy Scale, the Interpersonal Trust Scale, time of responses, number of disclosures, and the level of intimacy of disclosures. The independent variables were physical contact and thermal warmth/cold. Preliminary assumption testing was conducted to check for normal distribution and homogeneity of variance-covariance matrices. The Level of Intimacy, $D(94) = .08$, $p > .05$ was normally distributed. The Total Empathy, $D(94) = .21$, $p < .05$; Total Trust, $D(94) = .07$, $p < .05$; Total Time, $D(94) = .13$, $p < .05$; and Total Number of Disclosures, $D(94) = .13$, $p < .05$ were not normally distributed. The cell size for each condition exceeds 20 participants. Therefore, Wilk's Lambda was used and considered robust despite violation of the assumption of normal distribution (Field, 2009).

In addition, the following steps, as outlined by Field (2009), were implemented to address issues with outlier data. Outlier data were defined as greater than two standard deviations above the mean in this study. Outlier data were identified for five participant scores for Total Time Measured, which was the recorded time of the participant's responses. The scores for the five items were replaced with the value for a *z*-score of 2.0. Data were replaced with the value for a z-score of 2.0 for the three participant scores identified as outlier data for Total Number of Disclosures. A repeated Kolmorgov-Smirnof test found the Level of Intimacy, $D(94) = .08$, $p > .05$ and Emotional Trust, $D(94) = .07$, $p > .05$, to be normally distributed. The test indicated that Empathy, Total Disclosures, and

Total Time were not normally distributed after correcting for outliers; $D(94) = .20$, $p < .05$, $D(93) = 12$, $p < .05$, $D(94) = .11$ $p < .05$, respectively. The variances were equal for Total Empathy, $F(3, 89) = .47$, *ns*; Total Trust, $F(3, 89) = .06$, *ns*; Total Time, $F(3, 89) = .14$, *ns*; Total Disclosures, $F(3, 89) = .93$, *ns*; and Total Level of Intimacy of Disclosure, $F(3, 89) = .92$, *ns*, using Levene's Test of Equality of Error Variances. Using Wilk's Lambda, there was a non-significant main effect of touch, $\Lambda = .92$, $F(5, 86) = .69$, $p = .636$, partial $\eta^2 = .038$, and a non-significant main effect of thermal warmth, $\Lambda = .97$, $F(5, 86) = .57$, $p = .725$, $\eta^2 = .032$, on trusting behaviors and attitudes. There was a non-significant interaction effect between touch and thermal warmth, $\Lambda = .93$, $F(5, 86) = 1.21$, $p = .309$, $\eta^2 = .066$. The table below indicates the partial eta squared calculations for each dependent variable. Figures 2 through 6, shown on pages 32 and 33, demonstrate the means and interaction effects for physical contact and thermal condition for each dependent variable.

Table 3
Partial Eta Squared: MANOVA

Dependent Variable	Contact	Thermal Condition	Contact x Condition
Number of Disclosures	.005	.010	.042
Level of Intimacy	.000	.014	.025
Total Empathy	.007	.011	.000
Total Trust	.026	.000	.001
Total Time	.001	.006	.043

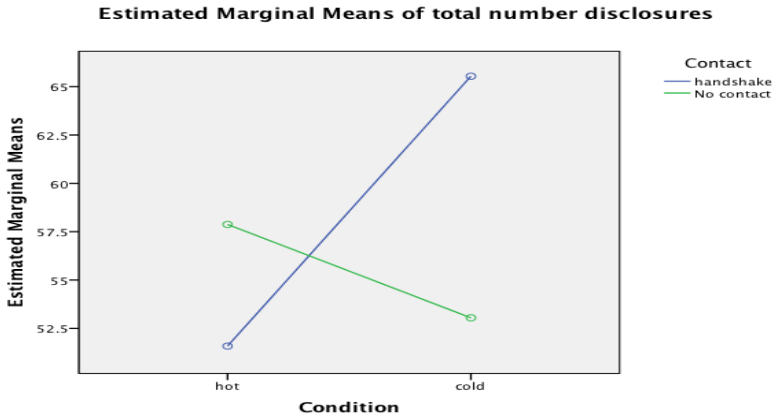

Figure 2. Means and interaction effects of total number of disclosures.

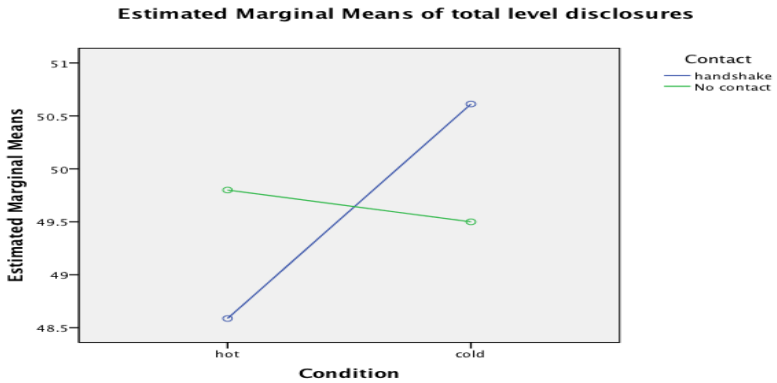

Figure 3. Means and interaction effects of total number of disclosures.

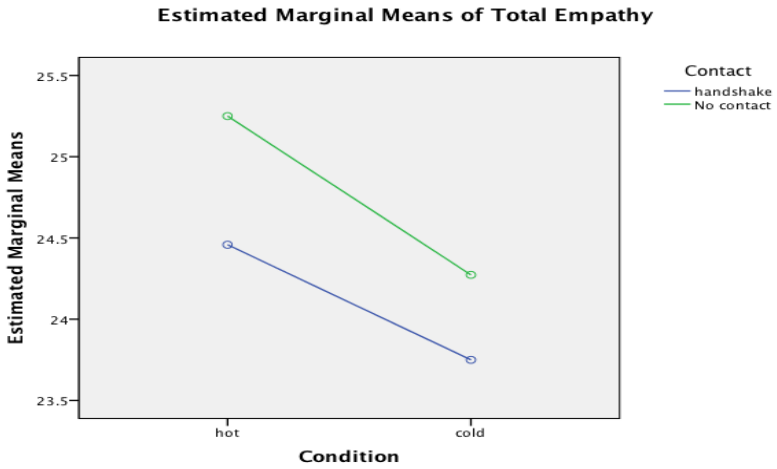

Figure 4. Means and interaction effects of total empathy.

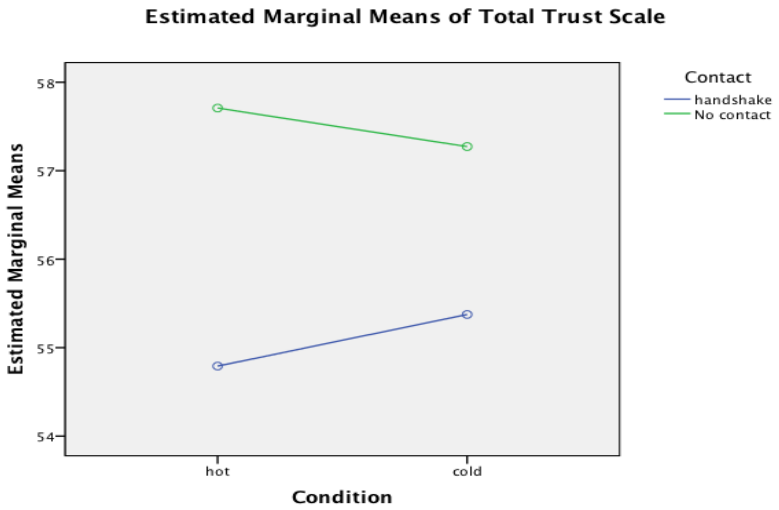

Figure 5. Means and interaction effects of total trust.

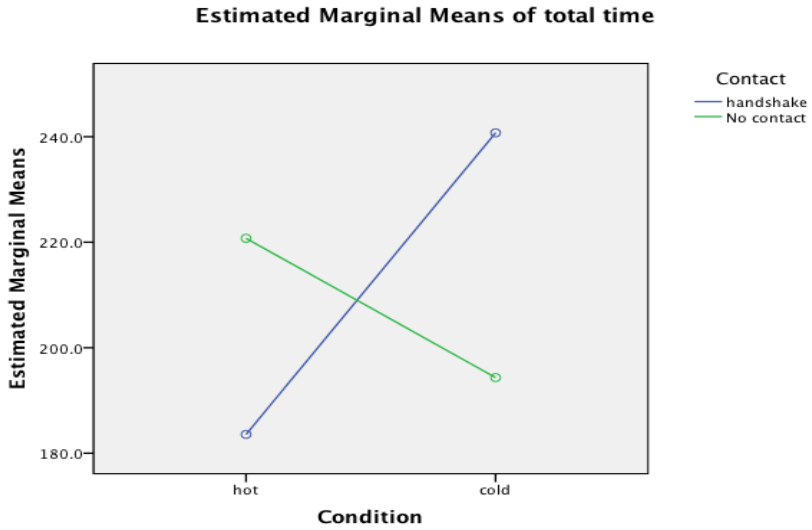

Figure 6. Means and interaction effects of total time.

Given the potential for outcome effects due to the different interviewers used, a one-way ANOVA was used to determine to explore differences between scores based on who did the interview. No significant effects were found between interviewers for: Total Empathy ($F(3, 90) = 1.9$, $p = .13$); Total Trust ($F(3, 90) = .62$, $p = .61$); Number of Disclosures ($F(3, 90) = .91$, $p = .44$); Level of Intimacy ($F(3, 90) = 1.8$, $p = .15$) and Total Time ($F(3, 90) = .14$, $p = .94$). In addition, correlations between indoor temperature and

outdoor temperature with each dependent variable were analyzed to determine the potential influence of the variables on outcome measures. Outdoor temperature was significantly correlated with the Empathy Scale. However, no other significant relationships were indicated. Therefore, the effects of indoor and outdoor temperature were not considered in analyses. The results were as follows (see Table 4):

Table 4
Correlations of Indoor and Outdoor Temperature with Dependent Variables

		TempOut	TempIN	Empathy	ET	Disclosur	Intimacy	Time
TempOut	Pearson	1	.231*	.232*	.004	.048	.090	.055
	Sig. (2-		.025	.025	.966	.643	.387	.599
	N	94	94	94	94	94	94	94
TempIN	Pearson	.231*	1	.091	-.083	-.155	.164	-.074
	Sig. (2-	.025		.384	.427	.136	.114	.480
	N	94	94	94	94	94	94	94
Total Empathy	Pearson	.232*	.091	1	.526**	-.202	-.071	-.162
	Sig. (2-	.025	.384		.000	.051	.499	.120
	N	94	94	94	94	94	94	94
Total Emotional Trust	Pearson	.004	-.083	.526**	1	.012	-.044	-.019
	Sig. (2-	.966	.427	.000		.911	.676	.854
	N	94	94	94	94	94	94	94
Total Number Disclosures	Pearson	.048	-.155	-.202	.012	1	.157	.869**
	Sig. (2-	.643	.136	.051	.911		.130	.000
	N	94	94	94	94	94	94	94
Total Level Intimacy	Pearson	.090	.164	-.071	-.044	.157	1	.146
	Sig. (2-	.387	.114	.499	.676	.130		.161
	N	94	94	94	94	94	94	94
Total time	Pearson	.055	-.074	-.162	-.019	.869**	.146	1
	Sig. (2-	.599	.480	.120	.854	.000	.161	
	N	94	94	94	94	94	94	94

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The relationship between measures of attitudes, measures of behaviors, and the relationship between attitudes and behaviors was explored using a Pearson product-moment correlation coefficient. As expected, there was a significant relationship between attitudes reported on the Empathy Scale and the Emotional Trust Scale, $r = .53$, $p < .01$, with high levels of perceived empathy associated with high levels of perceived emotional trust. Not surprisingly, there was a significant relationship between the Total Time and the Total Number of Disclosures, $r = .87$, $p < .01$. Although it did not reach statistical significance, it is worth noting that a small negative correlation is indicated between Total Empathy and Total Number of Disclosures. (See Table 5)

Table 5
Correlations: N = 94

		Total Empathy	ET	Disclos.	Intimacy	Total time
Total Empathy	Pearson	1	.526**	-.202	-.071	-.162
	Sig. (2-		.000	.051	.499	.120
	N	94	94	94	94	94
Total Emotional Trust	Pearson	.526**	1	.012	-.044	-.019
	Sig. (2-	.000		.911	.676	.854
	N	94	94	94	94	94
Total Number Disclosures	Pearson	-.202	.012	1	.157	.869**
	Sig. (2-	.051	.911		.130	.000
	N	94	94	94	94	94
Total Level Intimacy	Pearson	-.071	-.044	.157	1	.146
	Sig. (2-	.499	.676	.130		.161
	N	94	94	94	94	94
Total time	Pearson	-.162	-.019	.869**	.146	1
	Sig. (2-	.120	.854	.000	.161	
	N	94	94	94	94	94

Given findings by Goldman and Fordyce (1983) which suggested that combined physical contact and eye contact led to fewer trusting behaviors than receiving one condition alone, exploratory analyses were used to determine if a similar pattern exists with combined contact and thermal warmth in this study. The pattern of means suggests that participants who had received a handshake *or* a hot pack (Conditions 2 and 3) were more trusting in their behaviors when receiving a handshake and attitudes when receiving warmth than participants in Condition 1 who received a handshake *and* a hot pack. However, the differences in means were not consistent across measures for both attitudes and behaviors and did not reach statistical significance.

Because some studies suggest that the influence of touch or warmth on behaviors can occur without participants' awareness, the study asked about awareness of contact with the interviewer (Fisher et al., 1976; Williams & Bargh, 2008). Seven percent of the participants could not remember if they had physical contact when greeting the interviewer. Of the remaining participants, 3% inaccurately reported contact during the greeting. When asked about contact misgivings, only one of the participants in the total sample expressed concern for making contact due to germs. She disclosed an illness and refused to shake hands with the interviewer. Therefore, her data was excluded from the sample. (See Figure 7 on the next page.)

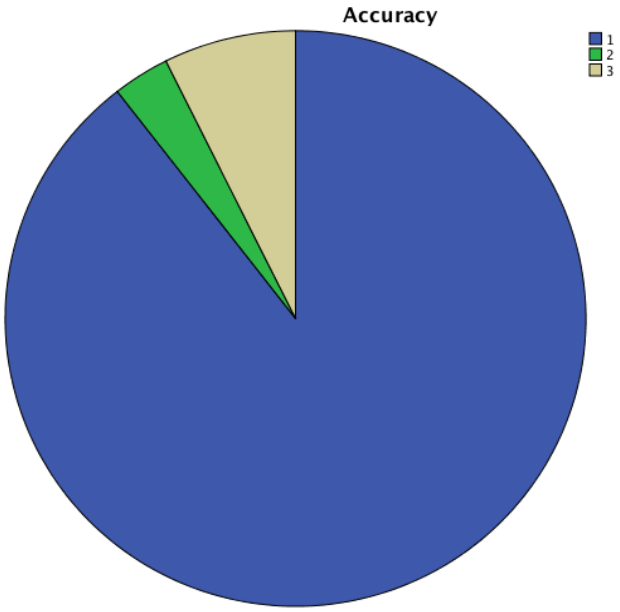

Figure 7. Awareness and accuracy of contact.

CHAPTER 5

DISCUSSION

Although the literature supports the efficacy of psychotherapy, researchers continue to explore the components of therapy that contribute to positive outcomes for clients during treatment. One contributing factor identified, regardless of therapeutic technique implemented, is the strength of the relationship between the client and the therapist. More importantly, studies have indicated that it is the client's perception of the relationship that leads to success in therapy (Assay & Lambert, 1999). Therefore, identifying factors that engender trust and contribute to building the therapeutic alliance is important. Research suggests that brief physical contact and thermal warmth can influence trusting behaviors and attitudes during interpersonal interactions. Recent studies have suggested that prosocial behaviors, such as sympathy and gratitude, can be communicated using physical touch. One study reported that participants were able to identify emotions through tactile communication with 50-70% accuracy (Hertenstein, Holmes, & Keltner, 2009). Similar effects have been indicated in studies exploring the role of tactile warmth on prosocial behaviors. Consistent with findings by Williams and Bargh (2008), a 2009 study by Ijzerman and Semin found that participants who were asked to briefly hold a cup of hot coffee reported that they perceived a known other to be closer in their relationship than participants who were asked to hold an iced coffee. Research on oxytocin, which is released through physical contact and warmth, indicates an underlying physiological role of the neuropeptide in engendering trust. However, many of the current studies on the effects of physical contact on trusting behaviors and attitudes are not directly linked to a therapeutic context. Those studies that examine the influence of touch within a psychotherapy session are limited in their findings due to the study design. Further, studies

exploring the effects of thermal warmth on prosocial behaviors are relatively new and involve a very brief interpersonal interaction. This study aimed to explore the effects of physical contact and warmth during an interview designed to be similar to the therapeutic environment. The findings contribute to the recent research on touch and tactile warmth by measuring trusting behaviors during a prolonged interpersonal exchange. The study assessed participant attitudes using self-report measures following the interaction. Based on the research findings available, this study hypothesized that both physical touch and thermal contact would engender trusting behaviors and attitudes.

The findings from this study indicate non-significant differences in trusting behaviors and attitudes in participants who had received physical contact and/or thermal warmth compared to those who received no contact or thermal cold. This is inconsistent with findings from the previous research cited. This study contributes to the current research exploring the effects of external stimuli discussed by exploring behaviors in a controlled context designed to be similar to a therapeutic interaction. Therefore, the breadth of the trusting behaviors considered was more extensive as was the level of intimacy explored. This study assessed trusting behaviors for a considerable period of time following the brief contact. The physical contact was clearly defined and socially normative.

To assess the breadth of trusting behaviors, the total number of disclosures and the total time the participant talked were measured. This study also examined the levels of intimacy of disclosures by asking participants to discuss various topics ranging in sensitivity during the interpersonal interaction. The depth of each disclosure was rated by

assistants blind to the experimental condition. Following the interview, two strongly correlated measures were used to measure participant perceptions of the interviewer.

Using exploratory analyses, the results comparing all four conditions indicated non-significant interaction effects between physical contact and thermal warmth/cold. A study by Goldman and Fordyce (1983) suggests that physical contact in combination with increased eye contact leads to fewer trusting behaviors and attitudes when compared to participants who only receive one or the other. Therefore, this study examined potential interaction effects after removing the contact *and* thermal warmth condition to determine if the combination created a level of intimacy that was uncomfortable during an initial meeting. However, no significant differences were observed in this study. Consistent with the findings by Pattison (1973), no significant difference was observed in this study for the participants' reports of perceived trust or empathy of the interviewer. Moreover, a small negative correlation was observed, although it did not reach significance, between behaviors and attitude in an exploratory analysis. This is inconsistent with the literature suggesting that touch and thermal warmth increases trusting attitudes or leads to more favorable perceptions of the experimenter (Erceau & Gueguen, 2007; Fisher et al., 1976; Horton et al., 1995; Ijzerman & Semin, 2009; Williams & Bargh, 2008; Willison & Masson, 1986). The findings suggest that as total number of disclosures increased, participants' reported that they perceived the interviewer to be significantly lower in empathy. The negative correlation observed may be important to consider in the therapeutic context. Studies on the therapeutic alliance have indicated that it is the client's perception of the therapist that is important in understanding the alliance and in turn what contributes to positive outcome in therapy (Assay & Lambert, 1999). A therapist may

believe the client feels a strong alliance if they are able to disclose information in therapy. However, the findings of the study appear to suggest that the number of disclosures in therapy may not be a good indication of the client's attitudes about the therapist. The study seems to provide support for the use of self-report assessment measures or increased discussion about the client's perception of the therapeutic relationship in the therapy session. However, it is possible that those participants who disclosed more during the structured interview felt a greater need for interviewer response, leading to a shift in perception of the interviewer compared to participants who said little during the interview.

While engendering prosocial attitudes and behaviors may contribute to positive treatment outcomes, the findings suggest that a brief exposure to contact and warmth as indicated in previous studies does not generalize to changes in attitudes or behaviors during a prolonged interpersonal interaction. The non-significant findings suggest that a brief contact or exposure to a warm or cold object may not impact the attitudes the client forms of the therapist or shape the behaviors during the therapy session. Continued studies to better understand methods to develop a strong therapeutic alliance, especially during an initial meeting, will be beneficial.

In addition, although research demonstrates that individuals who attend psychotherapy often benefit from intervention, various research available suggests that 20 to 57 percent of people who initiate psychotherapy treatment do not continue after the intake evaluation and 37 to 45 percent only attend two sessions (Schwartz & Flowers, 2011). The findings from this study may be useful to studies on engagement in therapy. Continued research to understand why patients do not follow through in therapy is needed. Further research exploring return rates for patients receiving conditions after considering

various components of the attitudes toward the therapist, behaviors during the initial session, and intentions to return to therapy would be interesting to understand what variables affect engagement behaviors. Given the small negative correlation observed, it would be interesting to understand differences in behaviors and attitudes that exist in therapy engagement. A study by Garcia & Weisz (2002) found that for patient's ages 7 to 18 years old, a measurement of therapeutic relationship completed by participants was the only factor that could accurately distinguish therapy dropouts from completers, accounting for 16% of the variance. Further research would be beneficial to understand methods to enhance engagement strategies and treatment compliance. While this study suggests that many factors probably have a stronger contribution to the therapeutic alliance than a handshake or brief contact with thermal warmth, the research available on continued care for patients in need of intervention services indicates that we will benefit from continued research to understand how to identify the key components necessary in developing a strong therapeutic alliance.

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Appendix A

Interviewer A Script

Greeting: (Participant Name), I am (Interviewer A). It's nice to meet you. Please come with me.

Consent

Introduction to Tasks: The purpose of this study is to explore the relationship between motor abilities and verbal fluency. Our goal is to better understand how the two are related and to determine what factors might influence both abilities. We will start today with a task designed to measure motor speed and coordination. Then I will ask you some questions in order to assess verbal fluency. The questions are not intended to determine "what" you know, but rather "how" you communicate verbal information. Basically, we are exploring speech patterns and would like to encourage natural responding by asking for information about your life. Therefore, the questions are designed to ask personal information about your attitudes, beliefs, and experiences, as this is knowledge most familiar to you.

After the interview questions, I will escort you to another room where you will meet with a second interviewer. She will ask you to complete two short forms and will explain each in greater detail. Your meeting with her should take approximately 15 minutes. She will be able to answer any questions you might have about participation today as well.

Let's begin with the first task.

Trail-Making Test

(Questionnaire)Thank you for your participation today. I will take you to meet with (Interviewer B) to complete the last two tasks. (escort to 2nd room).

Appendix B

Informed Consent Form

You are invited to participate in this research study. The following information is provided in order to help you make an informed decision whether or not to participate. If you have any questions please do not hesitate to ask. You are eligible to participate because you are a student in Psychology 101 at Indiana University of Pennsylvania (IUP).

The purpose of this study is to explore the relationship between movement abilities and verbal fluency. Our goal is to better understand how the two are related and to determine what factors might influence both abilities. Participation in this study will require approximately 45-60 minutes of your time and is not considered a part of Psychology 101. Participation or non-participation will not affect the evaluation of your performance in this class. You will receive credit for each hour or partial hour of time you spend participating in this research.

To explore how the brain interprets and responds to tactile temperature stimuli, you will be asked to briefly hold either a hot pack or cold pack in your non-dominant hand while performing a writing task. You will then be asked to describe experiences about school, family, and friends, as the focus of the study is on speech patterns, not intellectual abilities. The aim is to determine if language structures of the brain are impacted in any way. Verbal responses will be videotaped to increase accuracy in documentation. Finally, you will be asked to complete two brief measures to assess your experience in the study.

The information gained from this study may help to better understand movement and language relationships and how they are affected. There are no known risks associated with this research.

Participation in this study is voluntary. You will receive one hour of credit for your research requirement in Psychology 101 for each hour or partial hour of your time. You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or IUP. Your decision will not result in the loss of benefits to which you are otherwise entitled. If you choose not to participate you have the option of doing a review of an article to satisfy requirements in your General Psychology class. If you choose to participate, all information will be held in strict confidence and no identifying information will be attached to your responses. Information collected during the study will be stored in a locked cabinet in a locked room and only the principal investigator will have access to the data. The information provided will have no bearing on your academic standing or services you receive from the University. Your response will be considered only in combination with those from other participants. The information obtained in the study may be published in scientific journals or presented at scientific meetings but your identity will be kept strictly confidential.

If you are willing to participate in this study, please sign the statement below. The unsigned copy of the form is for you. If you choose not to participate, return the unsigned form to the Interviewer.

Principle Investigator
Rebecca Parker, M.A.
Doctoral Candidate
Department of Psychology
Uhler Hall
Indiana, PA 15705

Faculty Sponsor
David LaPorte, Ph.D.
Professor
Department of Psychology
Uhler Hall
Indiana, PA 15705
Phone: 724-357-4524

This project has been approved by the Indiana University of Pennsylvania Institutional Review Board for the Protection of Human Subjects (Phone: 724.357.7730).

Voluntary Consent Form

I have read and understand the information on the form and I consent to volunteer to be a subject in this study. I understand that my responses are completely confidential and that I have the right to withdraw at any time. I have received an unsigned copy of this informed Consent Form to keep in my possession.

Name (please print):_____

Signature: _____

Date: _____

Phone number or location where you can be reached: _____

Best days and time to reach you: _____

I certify that I have explained to the above individual the nature and purpose, the potential benefits, and possible risks associated with participating in this research study, have answered any questions that have been raised, and have witnessed the above signature.

Date:_____ Investigator's Signature:_____

Appendix C

Trail-Making Test

Trails A Practice Trial:

On this page are some numbers. Begin and number 1 and draw a line for 1 to 2, 2 to 3, 3 to

4, and so on, in order, until you reach the end. Draw the lines as fast as you can. Ready?

Begin.

Trails A Test Trial:

On this page are numbers from 1 to 25. Begin at number 1 and draw a line from 1 to 2, 2 to 3, 3 to 4, and so on, in order, until you reach the end. Remember, work as fast as you can. Ready? Begin. (begin timing)

Trails B Practice Trial:

On this page are some numbers and letters. Begin at number 1 and draw a line from 1 to A, A to 2, 2 to B, B to 3, # to C, and so on, in order, until you reach the end. Remember, first you have a number, then a letter, then a number, then a letter, and so on. Draw the lines as fast as you can. Ready? Begin.

Trails B Test Trial:

On this page are both numbers and letters. Do this the same way. Begin and number 1 and draw a line from 1 to A, A to 2, 2 to B, B to 3, 3 to C, and so on, in order, until you reach the end. Remember, first you have a number, then a letter, then a number, then a letter, and so on. Do not skip around, but go from one circle to the next in the proper order. Draw the lines as fast as you can. Ready? Begin. (begin timing)

Appendix D

Interview Questionnaire

1. How old are you?

2. What is your major?

3. Tell me about your classes.

4.What is your relationship status?

5. Tell me about your family?

6. What is your hometown?

7. Tell me about your friends.

8. What are your favorite things to do in your free time?

9. What are your feelings about drugs and alcohol?

10. What characteristics of yourself are you most proud of?

11. What are your feelings on religion?

12. What are some of the things that make you furious?

13. What are your feelings and attitudes about death?

14. What are some things you hate about yourself?

15. What has been the biggest disappointment in your life?

16. What do you dislike about your physical appearance?

17. What have you done in your life that you feel most guilty about?

18. What are some of the things that really hurt your feelings?

19. What characteristics of your best friend really bother you?

Appendix E

Interviewer B Script

Interviewer B

Hi, I am (Interviewer B). I am going to ask you to complete two short forms. I would like to understand your perception of how Interviewer A performed today. Your responses will be confidential and Interviewer A will not have access to response forms, nor will she be

able to link any shared views with a participant. We would appreciate your honest report of Interviewer A to help us determine our researcher training needs. For each form, you can circle the response for each item that most accurately describes your feelings about Interviewer A.

(Administer Empathy Scale)

(Administer Emotional Trust)

(Administer Germ/Awareness Questions)

Debriefing

Appendix F

Awareness and Germs

1. Did the interviewer shake your hand?

Yes No I don't know

2. Were you concerned about the Swine Flu or other germs?

Yes No

Appendix G

Emotional Trust

1. If the interviewer unexpectedly laughed at something I did or said, I would wonder if she was being critical and unkind.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree
1	2	3	4	5	6	7	8	9

2. I could talk freely to the interviewer and know that she would want to listen.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree

1	2	3	4	5	6	7	8	9

3. The interviewer would never intentionally misrepresent my point of view to others.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree
1	2	3	4	5	6	7	8	9

4. If the interviewer knew what kinds of things hurt my feelings, I would never worry that she would use them against me.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree
1	2	3	4	5	6	7	8	9

5. I would be able to confide in the interviewer and know that she would want to listen.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree
1	2	3	4	5	6	7	8	9

6. If the interviewer didn't think I had handled a certain situation very well, she would not criticize me.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree
1	2	3	4	5	6	7	8	9

7. If I told the interviewer what things I worry about, she would not think my concerns were silly.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree
1	2	3	4	5	6	7	8	9

8. I could expect the interviewer to tell me the truth.

Very Strongly Agree	Strongly Agree	Agree	Somewhat Agree	Neither Agree or Disagree	Somewhat Disagree	Disagree	Strongly Disagree	Very Strongly Disagree
1	2	3	4	5	6	7	8	9

Appendix H

Empathy Scale

1. I felt that I could trust the interviewer during the interview.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

2. The interviewer felt I was worthwhile.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

3. The interviewer was friendly and warm toward me.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

4. The interviewer understood what I said during the interview.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

5. The interviewer was sympathetic and concerned about me.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

6. Sometimes the interviewer did not seem to be completely genuine.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

7. The interviewer pretended to like me more than she really does.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

8. The interviewer did not seem to care about me.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

9. The interviewer did not understand the way I feel inside.

Not at all—0 Somewhat--1 Moderately--2 A lot--3

10. The interviewer acted condescending and talked down to me.

Not at all—0 Somewhat--1 Moderately--2 A lot—3

Appendix I

Debriefing Form

The Effects of Physical Touch and Thermal Warmth on Interpersonal Trust

Thank you for your participation and contribution to this study. Trust is an important component in individual and social functioning (Couch et al, 1996; Corcoran, 2001). Psychotherapy provides a unique environment where trust is particularly valuable. Increasing trust in therapy can lead to greater client improvement. While physiological and environmental influences can contribute to trusting behaviors and attitudes during

development, patterns in interpersonal relationships can be altered through interactions across the lifespan (Harlow, 1958; Insel & Quirion, 2005). Recent research suggests that simple external stimuli, such as physical touch and tactile warmth, can increase trust during such interactions, leading to more positive social relations (Bonitz, 2008; Durana, 1998; Pattison, 1973; Williams & Bargh, 2008). The purpose of this study is to explore the effects of a common form of physical contact before an interview; a handshake. The format is designed to be similar to the therapeutic setting. In addition, the study will expand upon the recent research on individual contact with warm or cold objects to observe trusting behaviors and attitudes. Your participation will contribute to better understanding of interpersonal trust, therapeutic relationships, and treatment outcomes.
To minimize bias in responses, the study was described as an exploration of the relationship between college students' movement coordination and verbal fluency, with tactile warmth/cold indicated as a potential influential variable. This deception was necessary so as not to influence the results. If you feel uncomfortable with the deception used during this study you are free to withdraw your information from this experiment. Further, if the deception used or the questions asked during the interview led to any negative emotions, you may benefit from counseling services at the Counseling Center at IUP (724.357.2621). All information collected during the study will be stored separately from identifying information and will be kept confidential.
I ask you to please maintain confidentiality about the purpose of this study as knowledge of the nature of the study may bias participant responses.
If you have any complaints, concerns, or questions about this research, please feel free to contact the Institutional Review Board for the Protection of Human Subjects at IUP:

Stright Hall, Room 113
210 South Tenth Street
Indiana, PA 15705
(724) 357-7730

If you are interested in this area of research, you may wish to read the following references:

Williams, L. E. & Bargh, J. A. (2008). Experiencing physical warmth promotes interpersonal warmth. *Science*, 322, 606-607.

Zak, P. J. (2003). Trust. *Capco Institute Journal of Financial Transformation*, 7,17-24.

Zak, P. J. Stanton, A. A. & Ahmadi, S. (2007). Oxytocin increases generosity in humans. *PLoS ONE*, 2(11). Retrieved from http://www.neuroeconomicstudies.org.