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The Influence of Tactile Temperature on Perceptions of Self and Other

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THE INFLUENCE OF TACTILE TEMPERATURE ON PERCEPTIONS OF SELF AND OTHERS

by

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Abstract

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Past research has shown that the tactile sensation of holding a hot object can increase positive perceptions of others (Williams & Bargh, 2008). The aims of the present study were to replicate the original finding as well as evaluate whether this process of embodied cognition extended to perceptions of self. Participants were randomly assigned to hold briefly a lidded cup at a certain temperature—hot, neutral, or cold—before filling out measures that assessed their perceptions of both self and others. The study failed to replicate the original study's findings. Further, there was no evidence to suggest a relationship between perceptions of self and experiences of tactile warmth. Limitations and implications are discussed.

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Chapter 1

Introduction

Embodied cognition is the theory that bodily experiences influence human behavior, thoughts, and feelings by activating existing knowledge or concepts in the brain (e.g., Barsalou, 2008; Williams, Huang, & Bargh, 2009). This influence can often be unconscious, which involves subliminal priming, or the unconscious exposure to a prompt (Dijksterhuis & Bargh, 2001; Murphy & Zajonc, 1993). These primes can involve verbal/auditory (e.g., Bargh, Chen, & Burrows, 1996), visual (Ansorge, Kiefer, Khalid, Grassl, & König, 2010), olfactory (e.g., Holland, Hendriks, & Aarts, 2005), and tactile cues (e.g., Ackerman, Nocera, & Bargh, 2010).

In regards to tactile cues, a number of object characteristics have been revealed to affect the way a person acts, thinks, feels. For example, Ackerman et al. (2010) demonstrated that the weight and roughness of an object could change perceptions of an individual or task. In addition, research has shown that sitting on a hard (Ackerman et al., 2010) or powerful chair, like the chair of an authority figure (Chen, Lee-Chai, & Bargh, 2001) can also change the way a situation is viewed. Further, the temperature of an object being held has been shown to influence perceptions of another individual (e.g., Williams & Bargh, 2008).

It has been theorized that perceptions of another's interpersonal warmth may be based on concrete physical experiences (Asch, 1958). Warmth has been identified as a central concept driving how individuals view others (Asch, 1946; Fiske, Cuddy, & Glicke, 2007). Past research has demonstrated that perceptions of others can be manipulated easily by providing observers with the descriptors *warm* and *cold* (Asch, 1946). These terms have been shown to respectively increase or decrease ratings of certain abstract personality characteristics (e.g., generosity, happiness, humor), which are referred to as central traits. However, ratings of other personality characteristics like

reliability, physical attractiveness, and persistence seem to remain unaffected. This suggests that the category "warm-cold" activates preexisting notions individuals' hold about what it means to be warm. That is, we tend to think of warm individuals as being happier, funnier, and more sociable than cold individuals.

Based on Asch's (1946) study, Williams and Bargh (2008) had 40 participants hold either a hot or cold cup during an elevator ride that lasted around 30 seconds. The participants were then taken the lab where they, after an undisclosed amount of time, rated the personality of a hypothetical person. Participants who held the hot cup of coffee gave more positive ratings of interpersonal warmth than the participants who held the cold cup. Perceptions of others were affected by holding a hot or cold cup in the same manner that presenting the descriptors *warm* or *cold* was found to affect perceptions in Asch's (1946) original study: quickly and unconsciously.

Research has shown that individuals perceive others differently from how they view themselves (Jones & Nesbitt, 1972). This difference may be due to the amount of information available to the individual when making judgments. It is theorized that perceptions of others are formed by what can be viewed externally. As explained by the fundamental attribution error, observers tend to overestimate another's personality or disposition as the cause of a behavior and underestimate the influence of the situation (Heider, 1958; Jones & Nisbett, 1972; Nisbett & Ross, 1980). Further, people have a tendency to use the least amount of cognitive resources necessary and therefore are unlikely to reevaluate these initial interpretations of behavior (Fiske & Taylor, 1984).

Perceptions of self, however, are said to be rooted in an individual's own internal cues like sensations, emotions, and cognitions (Jones & Nisbett, 1972). Self-perception theory holds that individuals infer their own attitudes, opinions, and other internal states partly by observing their behavior and the circumstances in which that behavior occurs (Bem, 1965). Therefore, an individual has far more information about his or her feelings

and intentions that surround an event than they do when they form perceptions of others. Bem (1965) also stated that if internal cues were weak, ambiguous, or uninterpretable, and perceptions of self would be similar to those made by an observer.

In regards to tactile cues of embodied cognition, research has shown that experiencing physical warmth or coldness can induce personal feelings of social warmth or coldness (e.g., Bargh & Shalev, 2011; IJzerman & Semin, 2009; Williams & Bargh, 2008; Zhong & Leonardelli, 2008). Social warmth has been described as the experience of feeling loved by and connected to other people (Inagaki & Eisenberger, 2013). For example, experiencing loneliness tends to evoke feelings of physical and social coldness (IJzerman & Semin, 2010; Zhong & Leonardelli, 2008). Loneliness can be treated through hot baths or showers or by holding a hot object (Bargh & Shalev, 2011). On the other hand, physical experiences of heat, ambient or tactile, has also been shown to promote aggressive social thoughts and behaviors when experiencing rejection, fear (Fay & Maner, 2014), or negative affect (Baron & Bell, 1976).

Although research has investigated the relationship between embodied cognition and feelings of loneliness and aggression, it has not addressed whether embodied cognition can affect global perceptions of self, including a person's mood, in the same manner as perceptions of other. This is an important question as negative self-perceptions of academic performance, cognitive competence, and physical appearance can predict depressive symptoms in girls (AlGhamdi, Manassis, & Wilansky-Traynor, 2011). With boys, negative self-perceptions of behavioral competence tend to be more predictive of depressive symptoms (AlGhamdi et al., 2011). In adults, persons with major depression view themselves more negatively than persons without (Gara et al., 1993). If embodied cognition effects, such as temperature, prove to increase positive perceptions of self, it could have potential implications for psychotherapy or treating depression.

Many studies investigating embodied cognition tend to compare only two temperature conditions. A limitation of this design is that researchers are unable to determine which condition is causing the changes in perceptions. Only by having a third, neural condition could an analysis determine whether one condition increased the positivity of ratings, the opposite condition decreased the positivity of ratings, or the both conditions worked in concert to affect ratings. Bargh and Shalev (2011) introduced a control condition where participants were not introduced to an object. Results indicated that holding a cold object increased feelings of loneliness. In addition, there was not a statistically significant difference between the hot and control condition. However, it is unknown whether holding a neutral, room temperature object may have an effect on perceptions of self and others.

The aim of this study, therefore, was to replicate Williams and Bargh's (2008) research on perceptions of others and investigate whether brief tactile warmth affected perceptions of both self and others. To allow for an assessment of whether the hot-cup condition increased positive perceptions, the cold-cup condition decreased positive perceptions, or both worked in concert to manipulate perceptions, a third, neutral-cup condition was added. Participants were randomly assigned to briefly hold a cup at a specified temperature—hot, neutral, or cold—before filling out measures that assessed their perceptions of both self and other.

Chapter 2

Method

Participants

The study involved 180 participants (45 males, 135 females), with a mean age of 22.2 years (range = 18–65, *SD* = 8.1). The participants identified themselves as having the following ethnicities: 77 (43%) African American, 75 (42%) Caucasian, 9 (5%) Hispanic, 8 (4%) Asian, and 11 (6%) mixed or other identity. Participants were undergraduate students enrolled in university psychology courses who received course credit for their participation.

Cup Temperature

On the day of the study, participants were randomly assigned to one of three temperature conditions: hot, neutral, or cold. Shortly before the participant's arrival, a researcher filled a tall, opaque cup with water at the specified temperature level. In the hot-cup condition, the cup was filled with water that had been heated on average to 110.3°F (*SD* = 4.9) by an electric teakettle. For the neutral-cup condition, bottled water that had been stored on average at 73.8°F (*SD* = 3.5) was used to fill the cup. Finally, in the cold-cup condition, the cup was filled with water that had been chilled to 45.1°F (SD = 6.9) on average using ice cubes. These temperatures, which were recorded using a temperature sensor, have been shown to be painless (Davis, Chan, Crawley, & Mikulis, 1998).

Procedure

Each participant was directed to meet a researcher, who was holding a cup and clipboard, at a first floor elevator. The researcher and participant then rode the elevator to the third floor, which lasted approximately 20 seconds. During the elevator ride, the participant was asked to hold the cup while the researcher filled out a form documenting

the time of the participant's arrival. When the elevator doors opened, the researcher took the cup back.

After arriving to the lab and giving their consent to participate (see Appendix A), the participant completed questionnaires on perceptions of others (see Appendix B), perceptions of self (see Appendix C), mood (see Appendix D), and demographics (see Appendix E). Because the perceptions of others and perceptions of self measures were very similar to each other, one measure was given first and the other measure was last. The order of the two measures was randomized. Once the measures were completed, the participant was debriefed on the purpose of the study.

Measures

Perceptions of others measure. This 10-item measure was derived from Asch's work on personality impression (Asch, 1946) and used in the original study (Williams & Bargh, 2008). Participants were given the following prompt: "Person A is intelligent, skillful, and industrious. Person A is also determined, practical, and cautious." Using this information, they were instructed to rate this figurative person's personality using the given scales. Each item was scored on a 10-point bipolar scale with the end points being opposites (e.g., happy and unhappy). Out of the 10 items, half were related to the hot-cold dimension (generous/ungenerous, happy/unhappy, good-natured/irritable, sociable/anti-social, and caring/selfish) and were averaged into a single score reflecting interpersonal warmth judgments. The remaining items (attractive/unattractive, serious/carefree, talkative/quiet, strong/weak, honest/dishonest) were unrelated to the hot-cold dimension and were also averaged into a single score (see Appendix A).

Perceptions of self measure. This 10-item measure was a rewritten version of the scale used in the original study (Williams & Bargh, 2008). Participants were given the following instructions: "Below is a list of personality traits. Using the given scales, please rate your personality." Each item was scored on a 10-point bipolar scale with the end

points being opposites (e.g., happy and unhappy). Out of the 10 items, half were related to the hot-cold dimension (generous/ungenerous, happy/unhappy, good-natured/irritable, sociable/anti-social, and caring/selfish) and were averaged into a single score reflecting interpersonal warmth judgments. The remaining items were unrelated to the hot-cold dimension and were also averaged into a single score (see Appendix B).

Profile of Mood States, Short Form (POMS-SF). This 37-item adjective rating form assessed transient mood states (Shacham, 1983) and has been shown to be comparable to the original scale by McNair, Lorr, and Droppleman (1971). Participants were given the following instructions: "The following items contain words that describe feelings people have. Please select the choice that best describes how you feel at the moment." Each item was scored on a 10-point scale with labels of *not at all* (1), *somewhat* (4), *moderately* (7), and *extremely* (10). Scores for the POMS-SF were calculated for a total mood score and for each of the 6 factors: tension, depression, anger, vigor, fatigue, and confusion (see Appendix C).

Chapter 3

Results

The main analyses investigating perceptions were carried out by means of a Target × Temperature analysis of variance. Participant ratings for perceptions of others did not vary as a function of the temperature condition, $F(2,177) = .41$, $p = .7$. Additionally, analysis did not indicate a statistically significant relationship between participant ratings for perceptions of self and temperature condition, $F(2,177) = .24$, $p = .8$.

A second analysis investigating the role of sex was carried out by means of a Temperature × Target × Sex analysis of variance in which the target of the rating represented a repeated measures factor. Analysis indicated that perception ratings varied jointly as function of who was being rated and the sex of the participant, Target × Temperature × Sex $F(2, 174) = 2.86$, $p = .06$. This prompted further analyses with perceptions of self and others separately.

As shown in the top half of Figure 1, males gave more positive ratings for perceptions of self in the hot-cup condition ($M = 8.5$, $SD = 1.1$) than the neutral-cup ($M = 8.2$, $SD = 1.7$) or cold-cup condition ($M = 8.2$, $SD = 1.1$); however, additional analyses failed to indicate a statistically significant effect for either the linear contrast for temperature, $\psi = 0.31$, $F(1, 174) = 0.42$, $p = .5$, $d = 0.06$, or the quadratic contrast for temperature, $\psi = 0.29$, $F(1, 174) = 0.14$, $p = .7$, $d = 0.02$. When rating perceptions of self, females gave more positive ratings in the cold-cup condition ($M = 8.5$, $SD = 1.39$) than the hot-cup ($M = 8.3$, $SD = 1.2$) or neutral-cup condition ($M = 8.2$, $SD = 1.2$). Similar to the males, analysis failed to indicate a statistically significant effect for either the linear contrast for temperature, $\psi = -0.18$, $F(1, 174) = 0.44$, $p = .5$, $d = -0.40$, or the quadratic contrast for temperature, $\psi = 0.37$, $F(1, 174) = 0.60$, $p = .4$, $d = 0.12$.

The bottom half of Figure 1 highlights that the males gave more positive ratings for perceptions of others in the cold-cup condition ($M = 8.0$, $SD = 1.5$) than in the hot-cup

condition (M = 7.3, SD = 1.1) or neutral-cup condition (M = 7.2, SD = 1.5). Again, analysis failed to indicate a statistically significant effect for either the linear contrast for temperature, ψ = -0.67, F(1, 174) = 1.36, p = .2, d = -0.10, or the quadratic contrast for

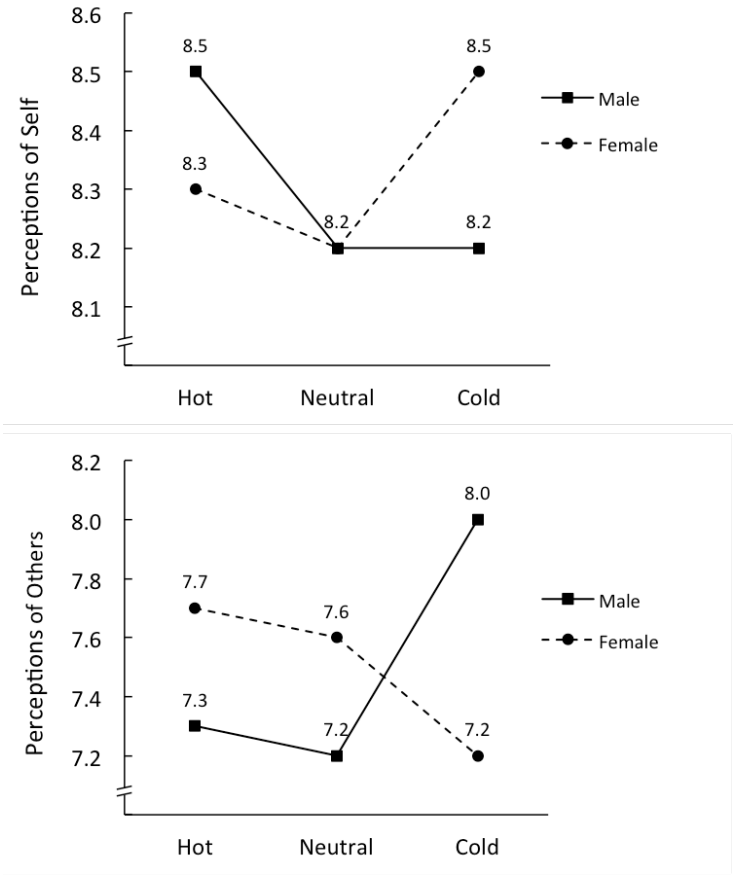

Figure 1. The effects of the temperature conditions on perceptions of self (top graph) and perceptions of others (bottom graph) as a function of sex. Both measures were rated on a 10-point scale.

temperature, ψ = 0.78, F(1, 174) = 0.69, p = .4, d = -0.06. Females indicated more positive perceptions of others in the hot-cup condition (M = 7.7, SD = 1.4) than in the neutral-cup condition (M = 7.6, SD = 1.5) or cold-cup condition (M = 7.2, SD = 1.7). For females, analysis once again failed to indicate a statistically significant effect for either

the linear contrast for temperature, $\psi = 0.46$, $F(1, 174) = 2.07$, $p = .2$, $d = -.1$, or the quadratic contrast for temperature, $\psi = -0.24$, $F(1, 174) = 0.17$, $p = .7$, $d = 0.07$.

Analysis did not indicate a statistically significant difference between the hot-, neutral-, and cold-cup conditions for ratings of mood, $F(1, 174) = 0.05$, $p = .9$. Further, the effect on temperature on mood did not vary as a function of the sex of the participant, Temperature × Sex $F(1, 174) = 1.76$, $p = .2$. The linear and quadratic effects of temperature on mood were not statistically significant for males, linear contrast $\psi = 1.95$, $F(1, 174) = 1.75$, $p = .2$, $d = -0.09$, quadratic contrast $\psi = 2.82$, $F(1, 174) = 1.17$, $p = .3$, $d = -0.05$, or for females, linear contrast $\psi = -2.89$, $F(1, 174) = 1.17$, $p = .3$, $d = -0.20$, quadratic contrast $\psi = -2.82$, $F(1, 174) = 0.28$, $p = .6$, $d = 0.16$.

Chapter 4

Discussion

Williams and Bargh's (2008) study was the first of its kind to investigate the relationship between embodied cognition and temperature. The current study failed to replicate the original study. Further, there was no evidence to suggest a relationship between perceptions of self and experiences of tactile warmth. Analysis, however, did indicate that males rated perceptions of self as more positive when holding a hot cup and perceptions of others as more positive when holding a cold cup. On the other hand, females gave more positive ratings for perceptions of self in the cold-cup condition and perceptions of others were rated more positive in the hot-cup condition. However, for both sexes the linear and quadratic contrasts of temperature were not statistically significant.

Many embodied cognition studies compare only two conditions (e.g., hot versus cold). Bargh and Shalev (2011) used a third control condition where participants did not experience the temperature manipulation. The current study, however, included a true middle condition where participants held a cup with water at room temperature. This design was unique from previous studies in that if effects were detected, the researchers could assess whether the hot-cup condition increased positive perceptions, the cold-cup condition decreased positive perceptions, or both worked in concert to manipulate perceptions.

One potential reason for the replication failure could be that experiences of warmth may not affect perceptions of others. The original study reported that participants in the hot-cup condition rated perceptions of a figurative person as more positive than participants in the cold-cup condition. It could be that the authors found a large effect by chance early on and quit collecting data.

Additionally, it should be noted that two previous Bargh articles have reportedly had problems with replication. In 1996, Bargh et al. reported that when given primes related to old age, participants tended to walk slower as they left the research lab, which indicated a priming effect. When attempting to replicate the study, Doyen, Klein, Pichon, and Cleeremans (2012) found a walking speed effect but only when the experimenter knew the purpose of the study. This suggested that the experimenter's expectations might have played a role in the original study's findings.

A second study was included in William and Bargh's (2008) publication. Here participants were asked to hold a hot- or cold-pack before choosing a reward. They were then asked whether they wanted to keep the reward or give it to a friend. Participants who held the hot-pack were reported more likely to be pro-social and give the reward to a friend. Lynott et al. (2014) attempted three high-powered, independent replications and failed to replicate Williams and Bargh (study 2, 2008). The authors also suggested that experimenter effects could have had a role in the original study's results.

Another possibility for the failure to replicate could be that there were slight methodological differences between the two studies. In the original study, the temperature of the cup was not measured prior to the experiment. Research assistants heated "the hot cup of coffee in the microwave for a minute (ensuring that it was hot to the touch)" whereas in the cold-cup condition, research assistants "kept the iced coffee cup in the refrigerator and replaced either the ice or the entire coffee cup as needed" (L. Williams, personal communication, August 10, 2012). Due to this difference, we cannot know for certain that the tactile experiences of warmth were comparable between studies; however, it could also be argued that the current study's approach is more preferable as it is more standardized.

A second methodological difference between studies is the amount of time the participant spent holding the cup. In the current study, participants held the cup for

approximately 20 seconds, whereas in the original study, the participants held the cup for "approximately 30 seconds" (L. Williams, personal communication, August 10, 2012). Although the difference in time spent holding the cup could have negatively affected the results of the current study, Kang, Williams, Clark, Gray, & Bargh (2011) found a change in perceptions of others when participants held a hot-pack for 10 seconds.

It is also possible that regional climate and elevation differences between the two studies may have led to the difference in findings. The original study was conducted in Boulder, Colorado, which is located at the base of the Rocky Mountains at an elevation above sea level of 5,430 feet with an average of 83.3 inches of snowfall a year (Boulder Convention and Visitors Bureau). The current study was conducted in Memphis, Tennessee, which has an elevation above sea level of 295 feet (Tennessee Department of Environment and Conservation). It could be argued that the original study's participants are used to colder temperatures and, therefore, more affected by hot temperatures.

There may also be methodological problems with the current study. After being presented with the temperature manipulation, participants were directed to the research lab, given a brief overview of the procedure, and presented with an informed consent. This process lasted anywhere from 2 to 5 minutes depending on questions asked by the participant. It could be argued that this length of time between the manipulation and measurement negatively affected the results of the study. There may be a window of time when the temperature prime is most effective. It should be noted that, in the original study, the length of time between the temperature manipulation and questionnaire was not mentioned. Therefore, it is not possible to know if the two studies are comparable in this aspect.

In addition, when it is cold outside, individuals tend to wear more clothes. Since participants were run throughout the fall semester, it could be argued that in addition to tactile experiences of temperature, the temperature outside had an affect on perceptions

of self and others. To assess for this effect, the current study recorded the outdoor temperature for each participant. Analysis failed to indicate a relationship between outdoor temperature and perceptions of self and others.

The current study used temperatures that were reported by Davis et al. (1998) to not cause the participant pain when holding the cup. It could be argued that the temperatures used for the current study may not have been extreme enough to manipulate perceptions of self. Neither the current study nor the original study used a manipulation check. Future studies could ask participants at the end of the study if they remembered the temperature of the cup. This would ensure that the temperatures for each condition are noticeable to the participant.

Because seven research assistants were used to run the study, it could be that individual differences between the assistants contributed to the lack of findings. However, analysis did not indicate that participants run by the same research assistant were more similar to one another than to participants run by another assistant.

In addition to replication, another goal of this study was to assess whether tactile temperature affected perceptions of self in the same manner as perceptions of others. Previous research has indicated a relationship between temperature and components of perceptions of self like loneliness (e.g., IJzerman & Semin, 2010; Zhong & Leonardelli, 2008). It was of interest to see if this same relationship occurred with global perceptions of self; however, analysis failed to indicate a statistically significant relationship. It could be argued that because perceptions of self are created using a larger amount of information (Bem, 1965) than used when creating perceptions of others, a simple manipulation like holding a cup at a specified temperature may not affect perceptions of self as easily.

Perceptions of self may also be more easily manipulated when temperature is applied to the larger areas of the body. Bargh and Shalev (2011) reported that loneliness

could be treated by applying temperature to the whole body through hot baths or showers. The current study had an average hot-cup temperature of 110.3°F and did not cause the participant pain. Research has shown that large areas of the body exposed to water above 44°C/111.2°F could lead to scalding and potentially death (Health and Safety Executive, 2012). This suggests that large areas of the body can be more sensitive to temperature in large amounts. Future studies could possibly use a heated blanket or a large heating pad for temperature manipulations involving warmth.

The lack of significant findings in the original and current study may be due to problems in the design of the original study. When participants were handed the cup, they often had other things in their hands like their phone or notebooks. It could be argued that the being handed a cup is too subconscious of a prime to be effective. Previous studies reported changes in perception ratings when participants were asked to hold either a hot- or cold-pack and give consumer evaluations as the temperature manipulation (Bargh & Shalev, 2011; Kang et al., 2011; Williams & Bargh, 2008). This could suggest that participants may need to be more cognitively aware of or focused on the prime for it to positively affect perceptions.

In addition, the perceptions of others questionnaire may not appropriately measure changes in how we view others. Asking a participant to rate an abstract, sexless individual's personality may lack generalizability. It may prove more beneficial to provide the participant with either a picture or short video of a person.

Finally, both studies collected more female than male participants. It should be noted that the original study only reported that the participants were modally female. Although the linear and quadratic contrasts were not significant, the current study's results suggested that female participants rated perceptions of others as higher when in the warm condition. It could be possible that the original study's results are due to having a high number of female participants. Future studies should make an attempt to collect an

even number of male and female. This would allow researchers to further investigate the difference in perceptions for males and females.

Previous research has demonstrated the effects of temperature on perceptions of others in social psychology (e.g., Williams & Bargh, 2008; Williams & Shalev, 2011). Although this study failed to replicate and extend those findings towards perceptions of self that does not mean that the relationship does not exist. If future research were to take the aforementioned changes into consideration and find a relationship between tactile experiences of temperature and perceptions of self, employers could potentially increase employee moral and create a happier work environment by replacing water coolers and drink machines with warmer beverage options. Hot beverages could be marketed to consumers as a mood-enhancing product.

Williams and Bargh's (2008) original finding could have a major implication for psychotherapy. If a client were to hold a hot-cup when meeting the therapist for the first time, increased perceptions of interpersonal warmth may positively influence perceptions of therapy empathy or therapeutic alliance—factors that are thought to be predictors of psychotherapy outcome (e.g., Greenberg, Elliot, Watson, & Bohart, 2001; Horvath & Symonds, 1991).

It could also be argued that positively increasing perceptions of self through the application of warmth could also prove beneficial to psychotherapy. Gara et al. (1993) reported that compared to control subjects, individuals with major depression viewed themselves more negatively. Psychotherapists could utilize experiences of tactile temperature as a technique to treat negative symptoms of depression, like decreased perceptions of self. This could potentially lead to a more positive psychotherapy outcome.

The current study's failure to replicate, however, may be indicative of a larger problem in research. In 2012, John, Loewenstein, and Prelec surveyed 2,000 anonymous

psychology researchers about their research practices. A high percentage of these researchers reported that they have previously engaged in questionable research practices, like failing to report all dependent measures or collecting more data after seeing whether results were significant, in order to obtain the desired outcome for a study. Although, some may not consider these fraudulent behaviors, these practices do increase a researcher's chance of finding evidence, which may not be naturally occurring, to support a hypothesis.

In an attempt to weed out studies with chance-finding and questionable research practices, there has been an argument for the more papers to attempt to replicate significant empirical research (e.g., Roediger, 2012). Subsequently, this has led to the APS creating of a new article type specifically designed for the publication of multi-lab replication studies. To assist with this effort, the Association of Psychological Science (APS) has a new article type specifically for the publication of high quality, multi-lab replication attempts regardless of outcome. By emphasizing reproducibility as opposed to novelty, researchers can help determine the true size of an effect and strengthen the field as a whole.

A number of studies over the past few years have emphasized the role of embodied cognition in influencing human behavior, thoughts, and feelings (Anderson, 2003; Barsalou, 2008; Williams et al., 2009; Wilson, 2002). The current study attempted and failed to replicate and extend a central study investigating the effects of embodied cognition. This failure to replicate, however, does not appear to be a unique finding in the literature. The Social Psychology journal recently published a special issue of over 25 embodied cognition replication studies with multiple failure to replicates (e.g., Lynott et al., 2014). These replication failures bring into question the strength and/or presence embodied cognition effects. Although it is probable that replication attempts may not be

conducted perfectly, future embodied cognition studies should strive to include more information about the methodology and analyses conducted to assist replication attempts.

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Appendix A

Participant Consent

THE UNIVERSITY OF MEMPHIS
Dreamers. Thinkers. Doers.

Institutional Review Board

315 Administration Bldg.
Memphis, TN 38152-3370
Office: 901.678.3074
Fax: 901.678.2199

Consent to Participate in a Research Study
PERCEPTIONS OF SELF AND OTHERS

WHY ARE YOU BEING INVITED TO TAKE PART IN THIS RESEARCH?

You are being invited to take part in a research study about perceptions of self and others. If you volunteer to take part in this study, you will be one of about 180 people to do so.

WHO IS DOING THE STUDY?

The person in charge of this study is Megan Battles of University of Memphis Department of Psychology. She is being guided in this research by Dr. Jeffrey S. Berman. There may be other people on the research team assisting at different times during the study.

WHAT IS THE PURPOSE OF THIS STUDY?

By doing this study, we hope to learn how individuals view themselves and others while being presented with different situations.

WHERE IS THE STUDY GOING TO TAKE PLACE AND HOW LONG WILL IT LAST?

The research procedures will be conducted at the University of Memphis. You will need to come to room 403 in the Psychology Building one time during the study. The visit will take about 30 minutes. The total amount of time you will be asked to volunteer for this study is 30 minutes over the next week.

WHAT WILL YOU BE ASKED TO DO?

As a part of this study, you will be asked to fill out three brief questionnaires, which ask questions about your perceptions of self and others.

WHAT ARE THE POSSIBLE RISKS AND DISCOMFORTS?

To the best of our knowledge, the things you will be doing have no more risk of harm than you would experience in everyday life. However, if participating in this study makes you feel upset, we can tell you about some people who may be able to help you with these feelings.

WILL YOU BENEFIT FROM TAKING PART IN THIS STUDY?

You will not get any personal benefit from taking part in this study.

DO YOU HAVE TO TAKE PART IN THE STUDY?

If you decide to take part in the study, it should be because you really want to volunteer. You will not lose any benefits or rights you would normally have if you choose not to volunteer. You can stop at any time during the study and still keep the benefits and rights you had before volunteering. As a student, if you decide not to take part in this study, your choice will have no effect on you academic status or grade in the class.

THE UNIVERSITY OF MEMPHIS.
Dreamers. Thinkers. Doers.

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IF YOU DON'T WANT TO TAKE PART IN THE STUDY, ARE THERE OTHER CHOICES?

If you do not want to be in the study, there are no other choices except not to take part in the study.

WHAT WILL IT COST YOU TO PARTICIPATE?

There are no costs associated with taking part in the study.

WILL YOU RECEIVE ANY REWARDS FOR TAKING PART IN THIS STUDY?

You will receive one half-hour research participation credit for taking part in this study. This credit can be used for psychology courses that require research participation.

WHO WILL SEE THE INFORMATION THAT YOU GIVE?

We will make every effort to keep private all research records that identify you to the extent allowed by law.

Your information will be combined with information from other people taking part in the study. When we write about the study to share it with other researchers, we will write about the combined information we have gathered. You will not be personally identified in these written materials. We may publish the results of this study; however, we will keep your name and other identifying information private. All data collected from this project will be made available for this and future research projects that deal with the same research area.

We will make every effort to prevent anyone who is not on the research team from knowing that you gave us information, or what that information is. All data will remain the property of the researcher. These data will be kept in a locked laboratory on computers password protected so that only authorized individuals can gain access to them. What will be accessible will only contain participant numbers as a means of identification. The personal information (i.e. name, phone number, email addresses) will be kept in a separate folder password protected with a different password known only by the primary researcher and faculty mentor and destroyed at the end of the study. This is to ensure identifying information is not accessible, thus increasing confidentiality.

We will keep private all research records that identify you to the extent allowed by law. However, there are some circumstances in which we may have to show your information to other people. We may be required to show information which identifies you to people who need to be sure we have done the research correctly; these would be people from such organizations as the University of Memphis.

CAN YOUR TAKING PART IN THE STUDY END EARLY?

If you decide to take part in the study you still have the right to decide at any time that you no longer want to continue. You will not be treated differently if you decide to stop taking part in the study.

The individuals conducting the study may need to withdraw you from the study. This may occur if you are not able to follow the directions they give you, if they find that your being in the study is

Appendix A (Continued)

THE UNIVERSITY OF MEMPHIS.
Dreamers. Thinkers. Doers.

Institutional Review Board

315 Administration Bldg.
Memphis, TN 38152-3370
Office: 901.678.3074
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more risk than benefit to you, or if the agency funding the study decides to stop the study early for a variety of scientific reasons.

WHAT IF YOU HAVE QUESTIONS, SUGGESTIONS, CONCERNS, OR COMPLAINTS?

Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions, suggestions, concerns, or complaints about the study, you can contact the investigator, Megan Battles at mbbttles@memphis.edu. If you have any questions about your rights as a volunteer in this research, contact the Institutional Review Board staff at the University of Memphis at 901-678-3074. We will give you a signed copy of this consent form to take with you.

_____ _____
Signature of person agreeing to take part in the study Date

_____
Printed name of person agreeing to take part in the study

_____ _____
Name of authorized person obtaining informed consent Date

Appendix B

Perceptions of Others

PERCEPTIONS OF OTHERS QUESTIONNAIRE

Below is a brief description of a person. Using this information, please rate this person's personality using the given scales.

PERSON A IS INTELLIGENT, SKILLFUL, AND INDUSTRIOUS. PERSON A IS ALSO DETERMINED, PRACTICAL AND CAUTIOUS.

1	2	3	4	5	6	7	8	9	10
Generous									Ungenerous
1	2	3	4	5	6	7	8	9	10
Happy									Unhappy
1	2	3	4	5	6	7	8	9	10
Good-Natured									Irritable
1	2	3	4	5	6	7	8	9	10
Sociable									Antisocial
1	2	3	4	5	6	7	8	9	10
Attractive									Unattractive
1	2	3	4	5	6	7	8	9	10
Serious									Carefree
1	2	3	4	5	6	7	8	9	10
Talkative									Quiet
1	2	3	4	5	6	7	8	9	10
Caring									Selfish
1	2	3	4	5	6	7	8	9	10
Strong									Weak
1	2	3	4	5	6	7	8	9	10
Honest									Dishonest

Appendix C

Perceptions of Self

PERCEPTIONS OF SELF QUESTIONNAIRE

Below is a list of personality traits. Using the given scales, please rate your personality.

1	2	3	4	5	6	7	8	9	10
Generous									Ungenerous
1	2	3	4	5	6	7	8	9	10
Happy									Unhappy
1	2	3	4	5	6	7	8	9	10
Good-Natured									Irritable
1	2	3	4	5	6	7	8	9	10
Sociable									Antisocial
1	2	3	4	5	6	7	8	9	10
Attractive									Unattractive
1	2	3	4	5	6	7	8	9	10
Serious									Carefree
1	2	3	4	5	6	7	8	9	10
Talkative									Quiet
1	2	3	4	5	6	7	8	9	10
Caring									Selfish
1	2	3	4	5	6	7	8	9	10
Strong									Weak
1	2	3	4	5	6	7	8	9	10
Honest									Dishonest

Appendix D

Profile of Mood States, Revised

PROFILE OF MOOD STATES-SHORT FORM

The following items contain words that describe feelings people have. Please select the choice that best describes how you feel at the moment.

1 = not at all 4 = somewhat 7 = moderately 10 = extremely

1. Tense
2. Angry
3. Worn out
4. Unhappy
5. Lively
6. Confused
7. Peeved
8. Sad
9. Active
10. On Edge
11. Grouchy
12. Blue
13. Energetic
14. Hopeless
15. Uneasy
16. Restless
17. Unable to Concentrate
18. Fatigued
19. Annoyed
20. Discouraged
21. Resentful
22. Nervous
23. Miserable
24. Cheerful
25. Bitter
26. Exhausted
27. Anxious
28. Helpless
29. Weary
30. Bewildered
31. Furious
32. Full of pep
33. Worthless
34. Forgetful
35. Vigorous
36. Uncertain about things
37. Bushed

Appendix E

Demographics

PARTICIPANT INFORMATION

1. Your Age: _____

2. Your Sex: ☐ male ☐ female

3. Ethnicity: ☐ African American ☐ Caucasian

☐ Asian ☐ Hispanic

☐ Other _____