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When Focusing on Differences Leads to Similar Perspectives: A Replication Study of Todd, Hanko, Galinsky, and Mussweiler (2011)

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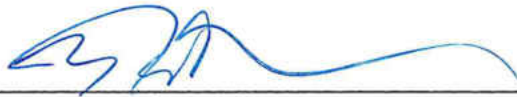
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When Focusing on Differences Leads to Similar Perspectives: A Replication Study of
Todd, Hanko, Galinsky, and Mussweiler (2011)

By

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A Replication Study of Todd, Hanko, Galinsky, and Mussweiler (2011)

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in partial fulfillment of the requirements
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DEDICATION

This thesis is dedicated to the ECU Psychology Department for their invaluable role in shaping me as a person and as a scientist.

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Many thanks to my thesis committee chair and role model, Dr. Matthew Winslow, for his insight and encouragement. I would also like to thank the other members of my committee, Drs. Jonathan Gore and Richard Osbaldiston, for their guidance through this process. Finally, I would like to thank my parents, Geneva and Marvin Whitt, for always supporting my dreams and encouraging me to make a difference in the world.

ABSTRACT

Todd et al., (2011) found support for the hypothesis that participants primed with a difference mind-set were more likely to spontaneously adopt an other-oriented visual perspective than participants primed with a similarity mind-set or participants in a control condition. The current study was an attempt to directly replicate this finding using American and German samples collected via Amazon's Mechanical Turk. The project utilized the 'Replication Recipe' (Brandt et. al, 2014) to facilitate the replication process and set the conditions necessary for replication access. The replication was deemed inconclusive; possible explanations are discussed.

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LIST OF ABBREVIATIONS AND SYMBOLS

Alpha.....	α
Amazon's MechanicalTurk.....	<u>MTurk</u>
Beta.....	β
Chi Square Statistic	χ^2
Cohen's Measure of Effect Size.....	<u>d</u>
Cramer's V.....	ϕ_c
F-test Statistic.....	<u>F</u>
Group Size.....	<u>n</u>
Hypothesizing After the Results are Known.....	<u>HARKing</u>
Open Science Framework.....	<u>OSF</u>
Partial Eta Squared.....	η^2
Sample Size.....	<u>N</u>
Significance.....	<u>p</u>
T-test Statistic.....	<u>t</u>

CHAPTER 1

Introduction

General Introduction

To walk in the shoes of another is to understand the person to whom those shoes belong. Perspective taking is often conceptualized in this way; we slip on the shoes of another person and experience what they experience. Somehow that insight into another's life gives us the ability to feel what they feel and respond to that individual in an appropriate way.

Intuitively, one might guess that this insightful look into another person's life is made possible by the ability to recognize commonalities with those around them. After all, understanding the experiences of another person and appropriately responding to them - the human capacity for empathy - comes from connecting experiences and building upon similarities. But what if perspective taking - the most basic component of empathy - can be prompted without focusing on commonalities? What if focusing on differences can lead to more effective perspective taking? Todd, Hanco, Galinsky, and Mussweiler's (2011) found support for this position. The purpose of the current study was to directly replicate Todd et al., (2011) in an effort to reproduce the findings from the original study. The decision to pursue this replication project is two-fold: to authenticate the theoretical findings of the original study in regards to perceptual perspective taking and also to contribute replication material to the current body of social psychological research, as an attempt to produce more authentic and accurate science. I will first justify my decision to replicate this particular research, describe Todd, et al.'s (2011) study, and

finally, I will explain the importance of replication and how the current replication project fits into the larger picture of replication research.

Decision to Replicate Todd, Hanko, Galinsky, and Mussweiler (2011)

The present study was a replication attempt of the Todd, et al. (2011) experiment on perceptual perspective taking. The results of the original experiment are both theoretically confounding and uniquely attractive. It is important to replicate this study because it could be key to understanding some of the basic mechanisms of perspective taking. Research that focuses on the general topic of perspective taking is an important pursuit, as it serves as a cognitive ability vital to social interaction. Exploring the mechanisms that influence and are influenced by perspective taking ability can reveal important relationships about the social world.

Previous research has shown that when individuals focus on similarities this promotes better perspective taking between those taking part in a social interaction (Heinke & Louis, 2009; Williams, Parker, & Turner, 2007). Such studies suggest that the more similar a participant feels to a target, the more likely they are to take the perspective of that target. Previous research has also found that when participants rate themselves as highly similar to a target, they are more likely to show empathy (Batson, Lishner, Cook, & Sawyer, 2005; Heinke & Louis, 2009). These findings suggest that similarity encourages not only perspective taking but also higher order social activities such as exercising empathy.

Many studies have linked perspective taking to empathic concern (Bensalah, Caillies, & Anduze, 2016; Todd, Bodenhausen, Richeson, & Galinsky, 2011). Together

empathy and perspective taking have then been used to predict a variety of other attributes including wellbeing (Shanafelt et al., 2005), aggression (Bussey, Quinn, & Dobson, 2015), and racial bias (Galinsky & Moskowitz, 2000; Todd, Bodenhausen, Richeson, & Galinsky, 2011). The breadth of this research is evidence of how applicable the current study is to understanding human interaction. Being informed on perspective taking abilities could be significant in dismantling racial prejudice or helping to improve social relations.

The results of the Todd, et al. (2011) study diverge from the studies mentioned above; they claim that perspective taking is fostered under conditions in which participants are primed to focus on dissimilar attributes. However, Todd et al. (2011) assert that focusing on similarities may compromise one's ability to separate one's own perspective from another's. This is problematic, as divorcing one's own perspective from that of another person is an essential component of perspective-taking ability (Decety & Sommerville, 2003; Higgins, 1981; Mitchell, 2009; Tamir & Mitchell, 2010).

Todd, et al. (2011) focused on a particular kind of skill known as spatial perspective taking. Spatial perspective taking is the ability to imagine what another person is seeing, in a literal sense, by figuratively putting one's self in the same spatial position. This ability possesses clear evolutionary advantages. Imagining where others are and where they are moving in three-dimensional space, provides an educated basis on which to predict future movements and accordingly orient one's position. Spatial perspective taking happens quickly and spontaneously allowing one to anticipate the movements of others, the objects they see, and where those objects exist (Bockler & Zwickel, 2013). One example of how spatial perspective taking works can be illustrated

by imagining walking down a crowded sidewalk. Spatial perspective taking would help to prevent one from running into another person, as the individual visualizes the movements and paths of those around them in order to prevent collision.

In the original study, Todd, et al. (2011) used the spatial perspective taking work of Tversky and Hard (2009) in their experimental manipulation. The participants' task was to imagine themselves in the spatial position of the person in the photograph that Tversky and Hard (2009) provided. The question that Todd, et al. (2011) asked was whether or not participants could be primed to take on a certain mind-set that would make them more likely to adopt the perspective of the individual in the Tversky and Hard (2009) photograph. As previously mentioned, the mind-sets that the original authors tried to prime were a similarity-mind-set and a difference-mind-set. Results showed those participants primed with a difference-mind-set took the perspective of the person in the photograph the most.

Returning to the stated purpose of this replication study, which is to authenticate the theoretical findings of Todd, et al. (2011), it is important to distinguish that this replication study is not an explicit attempt to refute either theoretical stance. This replication is an effort to validate what is currently a novel finding in the field. After all, it could be that focusing on either similar or dissimilar attribute promotes perspective taking, and future research will be needed to determine in what circumstances each plays a more prominent role.

Description of Todd, Hanko, Galinsky, and Mussweiler (2011)

In the original study, Todd, et al. (2011) found that focusing on differences was more likely to lead to similar perspectives as opposed to when participants focused on similarities. The study was designed to test the effects of difference-mindsets by measuring participants' visual perspective taking ability. Eighty-two German undergraduates were randomly assigned to either a similarity-mind-set, difference-mind-set, or control condition. In each condition the participants were asked to compare four different pairs of pictures. Those in the similarity-mind-set condition were asked to find similarities amongst the pictures. Those in the difference-mind-set condition were asked to focus on the differences amongst the pictures, and those in the control condition were asked to list three descriptive attributes of the pictures. Participants in the similarity-mind-set and difference-mind-set conditions were being primed to take on a particular mind-set, depending upon whether they were asked to focus on similarities or differences. This hypothesis stems from theoretical accounts asserting that while engaging in perspective-taking the initial focus on self-other similarities is followed by some adjustment for self-other differences (Epley et al., 2004; Nickerson, 1999).

It is believed that the primed mind-set carried over into the experimental task participants were then asked to complete (Corcoran et al., 2009; Mussweiler & Damisch, 2008). In order to measure perspective taking, all study participants, regardless of mind-set condition, were shown an identical photograph depicting a person sitting at a table with a bottle and a book. After viewing the photograph, participants were asked, "On what side of the table is the book?" If participants responded to the question from their own perspective, their response was scored as self-oriented. However, if participants

responded to the question from the perspective of the person in the photograph, their response was coded as other-oriented. This measure of perspective taking was taken from research by Tversky and Hard's (2009) research. Todd, et al. found that participants assigned to the difference mind-set were more likely to take the perspective of the person in the photograph, compared to those in either the similarity mind-set or control conditions.

The Replication Crisis

Currently in the field of social psychology, there has been talk of a "replication crisis." This crisis refers not only to the lack of replication studies in psychology (Makel, Plucker, & Hegarty, 2012) but also to the inability to reproduce findings (Open Science Collaboration, 2015). This poses an issue for social psychologists as it brings into question the validity of psychologists' work and their ability to contribute to cumulative science. With growing doubts about the reproducibility of social psychologists' work, the number of studies approved for grant funding continues to shrink (Rozin, 2009). The ongoing replication crisis is not attached to a singular problem, however. It has roots in poor methodology, differing approaches to data analysis, and scientific misconduct. Consequently, addressing these issues has become an important part of being a modern social psychologist.

Present Reproducibility Rates

The conversation on reproducibility rates in the field of social psychology garnered much attention in 2015 when the Open Science Collaboration (2015) published

a controversial study outlining their statistical findings on the reproducibility rates of psychological measures. The study contained the cumulative findings from 100 direct replications of studies [something about how they were chosen]. The result of this large-scale replication endeavor was the shocking discovery that of these 100 replications less than half successfully reproduced the findings found in the original study. Another interesting number to take into consideration comes from Makel, Plucker, and Hegarty (2012) who report that of 500 randomly selected articles from the 100 most popular psychology journals, only 1.07% were reported replications.

That the field of social psychology has fallen under a replication crisis comes as no surprise. Because the field is one that deals in abstract constructs it can be difficult at times for researchers to operationally define the concepts with which they are working. The measures that are used in research are the only concrete way researchers have to measure elusive constructs such as love, happiness, and compassion. By successfully replicating their studies, researchers are able to validate that they accurately defined the constructs within their original research design. Replication is thus a tool of progressive and systematic science (Platt, 1964). Successful replication supports scientists in making validated causal claims about the abstract constructs they are trying to measure. Without the ability to say they can successfully reproduce their findings, social psychologists are limited in the claims they can make about their research and its potential real world applications.

Another factor to consider in the current replication crisis is the push for novel research in the social sciences. Researchers are often motivated to do novel research because original research is more likely to result in publishing and grant funding. The

pressure to produce novel research has even lead to the belief that replication is non-essential, non-creative work (Makel & Plucker, 2014). Such beliefs undoubtedly contribute to the pervading sentiment that replication is an arduous and inconsequential labor unworthy of pursuit.

Need for an Open Scientific Approach

When considering potential solutions to the replication crisis one must take into consideration the use of an open scientific approach. Open science refers to providing public access to research materials. Because research methods and results have fallen victim to deliberate tampering (Ioannidis, 2005; Lishner, 2015; Makel, 2014; Rosenthal, 1979; Stanley & Spence, 2014), it has become difficult to trust the current methods for conducting psychological research, especially if the procedures and materials are not accessible to other researchers. Effective replication requires strict fidelity to the original study's materials and procedures, and this fidelity is facilitated through open science approaches.

Researchers should be aware of a number of practices in their attempt to produce trustworthy and replicable results. Some of these practices include HARKing and promoting publically verifiable information. The term "HARKing" specifically refers to the use of questionable research practices and stands for "Hypothesizing After the Results are Known." Some of the actions distinctive of the practice include not reporting all measures used in a study, data peeking, and selectively reporting data (Makel, 2014). A HARKing approach to research is not only dishonest but also contributes to the low reproducibility rate. It is possible that there would be more successful replications if there existed more honest and accurate original studies to replicate. HARKing can be hard to

limit with the ever-increasing pressure on social psychology researchers to create novel and original measures (Makel & Plucker, 2014). Nevertheless, it is important for psychologists to remember the overarching effect such actions can have: creating false work can lead to an inability to replicate and reduce the overall validity of social psychological science.

Promoting a scientific culture that values publically verifiable information can improve our science (Lishner, 2015). One way to employ these principles is to provide researchers with an avenue to monitor and maintain not only their own research but also the research of other social scientists. This would give researchers an opportunity to hold themselves personally accountable for the work that they produce. It would simultaneously present them with an opportunity to allow other experts in the field to double-check their results or methodologies. Doing this could help reduce HARKing practices or prevent the allocation of resources towards unreplicable science. Presently, the Open Science Framework (OSF; Open Science Collaboration, 2015) is one resource that researchers can use in hopes of achieving a more open scientific culture. OSF is a public online database in which researchers from any scientific field are able to actively engage others in their scientific process. The site allows researchers to provide public access to each step of their research by requiring them to upload sources, initial hypotheses, measures and procedures, and collected data. Providing this public access, creates the potential to generate conversation about what constitutes a plausible replication and what is important to replicate (Stanley & Spence, 2014). Deciding to conduct a replication study should depend heavily upon a consensus amongst social scientists on what research holds great theoretical importance or needs substantial

validation. By providing access to easily accessible and accurate information, databases such as OSF thus have great potential in beginning the conversations that may lead to consensus about future research.

The Current Study

As stated previously, the goal of the current research was to conduct a direct replication of the original experiment by Todd, et al. (2011). As such, it is important to consider the definition of “direct” replication before conducting one. The type of replication conducted by a researcher plays a vital role in how a sample is selected, the methodology of the replication, how data is analyzed, and various other elements of how the research process is handled. In this section of the proposal I take a more in-depth look at direct replication, the current study’s use of the “Replication Recipe” (Brandt et. al, 2015), registration on Open Science Framework, and use of a sample from Amazon’s Mechanical Turk for data analysis.

Direct Replication

Direct replications are experiments that are intended to be as identical to the original experiment as possible (Earp & Trafimow, 2015). This means using the same equipment, materials, and procedure as the original study. The use of direct replication eliminates the introduction of new testing confounds into the experiment and allows researchers to attribute any statistical findings to the design of the original study. Consequently, direct replications are valuable because they can reveal flaws in either the theoretical justification, methodology, or the analysis of the original study. I am choosing to conduct a direct replication of Todd, et al. (2011) for two reasons. The first reason is

that a direct replication of this study has never been conducted before. By directly replicating this study, I will be adding to the current body of psychological research, and possibly support for the theory proposed in this study. The second reason I have chosen a direct replication is that until I am sure the original results are reproducible, research involving different operationalizations of the variables or different hypotheses may be dead ends.

The Replication Recipe

Since the goal of this project was to successfully conduct a direct replication, it will be necessary to match the methods and procedure of the original study as closely as possible. In order to accomplish this closeness, the project utilized the ‘Replication Recipe’ (Brandt et. al, 2014). This recipe was formulated as criteria for facilitating the completion of close replications, which differ from direct replications in that certain elements of the original experiment are kept constant while others are intentionally manipulated in a systematic way. The recipe incorporates five “ingredients” by addressing 36 questions deemed essential for a close replication (Appendix A). By following this recipe, my replication project addressed these 36 questions. The replication recipe was chosen as a research tool for this replication project because it has been shown to be a validated way to facilitate the replication process and keep researchers from committing common mistakes or biased errors.

Open Science Framework

The replication project was registered on Open Science Framework, the online database mentioned previously. Some of the biggest threats to research today may be those committed by the researchers themselves. OSF is a way to keep researchers

accountable. It is also a useful way to document the research process, which is useful for record keeping and sharing research ideas and projects with other social scientists. Using OSF for this replication, is an effort to contribute to the growth of the open scientific community described previously in the paper. The OSF page for this replication attempt can be accessed via the following URL: <https://osf.io/8a9rk/>.

MechanicalTurk

In the original study the participants were a sample of German undergraduate students. The current study was disadvantaged in that it took place at an American university with no easy access to a German population. In light of this, a change in the methodology must occur. As opposed to recruiting undergraduate participants, the current study utilized participants from MechanicalTurk (MTurk). MTurk is an online web-based marketplace run by the electronic commerce company Amazon. The website is a place for private requestors to upload Human Intelligence Tasks (HITs) for online workers. These HITs are jobs that computers cannot perform and need a human being for completion. They include tasks such as transcribing audio recordings and writing articles.

MTurk also has become an advantageous website for social scientists. On MTurk psychologists can easily find participants for their studies. The workers must be compensated monetarily, but their participation can be very valuable. Many studies are criticized for having the “college sophomore problem” because researchers are forced to use convenience sampling and recruit undergraduate university students to participate in their experiments (Sears, 1986). The sophomore dilemma is thus that all of their participants are very similar, being about the same age and having similar interests. For example, should this study use university students, the study will be conducted at Eastern

Kentucky University, where participants for research tend to be undergraduate psychology majors. The students in the samples used at ECU tend to be similar: white, psychology students, female, and coming from similar backgrounds (Suedfeld, 2016). MTurk gives researchers the opportunity to work with a larger, more diverse sample. MTurk employs workers across the world, allowing for a sample that is demographically diverse. Such a diverse sample makes results easier to generalize to all human beings, as opposed to just undergraduate college students. This diversity would likely have been lacking had the study been completed solely with undergraduates.

MTurk also has the advantage of being online. As a venue for data collection, it seems promising as a quick and efficient way to recruit participants and store data. While being an online venue is an advantage, it can also be viewed as a disadvantage. MTurk is a relatively new way to collect data in the social sciences. It lacks the level of validation that other data collection venues have, meaning results extracted from MTurk samples should be taken with caution (Bates & Lanza, 2013; Paolacci & Chandler, 2014; Sharpiro, Chandler, & Mueller, 2013). MTurk still requires further investigation, as it is possible that ingrained within its population are certain biases.

The decision to use MTurk for this project stems from the recognition that there will not be access to the population from which participants in the original study were drawn. MTurk serves as a good alternative to test the reproducibility of the study. MTurk provides an opportunity to perform a replication with a population that allows for a generalization to humanity as a whole. Notably, MTurk also allows researchers to access to participants around the world, including MTurk workers located in Germany.

Research Hypotheses

Based on the information that is presented in the prior sections and the answers given to the questions of the Replication Recipe (Appendix B), it was my belief that the replication attempt of Todd, et al. (2011) would be successful. Here success was defined as replicating the original study in terms of effect size. Of course it is important to keep in mind the distinct difference between the samples of the two studies – the original study sampling a population of German college students (in person) and the replication study sampling an American population of MTurk workers (online). While it was the intention to conduct a direct replication and have no differences in methodology, this difference cannot be ignored and any differences between the results of the original study and the replication should be considered with this difference in mind.

CHAPTER 2

Method

Participants and Study Design

In total, 239 participants were recruited for the study on Amazon's MTurk with location qualification set to recruit in the United States and in Germany. The decision to collect data from an American sample was not influenced only by the convenience of the sample; it served to provide the study with a systematic manipulation of the original design, giving the researcher a means with which to compare the data collected from German participants. One hundred eighty-five participants were retained for the final analysis; by nationality the analyzed sample included 127 American participants and 58 German participants. There were 115 males and 70 females. The mean participant age was 34.25. Participant data was excluded from the analysis if the participant failed to follow the instructions of the study, identified a nationality other than American or German, or failed to complete the study. Participants were randomly assigned to one of three conditions: similarity-mind-set ($n = 67$), difference-mind-set ($n = 60$), or a control condition ($n=58$).

Procedure and Materials

Participants assigned to the similarity-mind-set and difference-mind-set conditions first completed a picture comparison task in which they were asked to compare four pairs of illustrated pictures by listing either three similarities or three differences for each pair (Mussweiler, 2001). Previous research shows that priming tasks of this nature activate either a similarity-mind-set or difference-mind-set depending on

whether they were asked to focus on similarities or differences and this mind-set is shown to carry over into experimental tasks (e.g. Corcoran et al., 2009; Mussweiler & Damisch, 2008). Participants in the control condition viewed one of the pictures from each pair and were asked to list three descriptive attributes.

After completing the picture task, the participants completed a spatial perspective-taking task (Tversky & Hard, 2009). The photograph the participants viewed depicts a person sitting at a table with a bottle and a book. The participants were asked, “On what side of the table is the book?” In order to conceal the purpose of the task, this critical question was embedded amongst several filler questions about aspects of the photograph. The photograph descriptions were scored from the participant’s viewpoint (the right side) as self-oriented and descriptions from the viewpoint of the person in the photograph (left side) as other-oriented.

Power Analysis

Using group proportions provided by Todd et al. (2011) of 34% (control group) and 62% (difference mind-set group), a power analysis was conducted using the 2-sample, 2-sided equality calculator from powerandsamplesize.com. Power ($1 - \beta$) was set at 0.80 and $\alpha = .05$. The analysis showed that a group sample size $n = 46$ was needed in order to be 80% confident that the null hypothesis correctly been rejected.

CHAPTER 3

Results

Several chi-square tests of independence were performed to examine the relationship between mind-set condition (similarity, difference, control) and perspective orientation (self-oriented perspective, other-oriented perspective; see Table E-1¹). The chi-square tests revealed no support for the original hypothesis of Todd et al. (2011); participants primed with a difference mind-set were not more likely to spontaneously adopt an other-oriented visual perspective than those in a similarity mind-set or control condition. In the combined American and German sample, there was no significant relation between mind-set condition and perspective orientation ($\chi^2(2) = 2.34$, $p = .30$, $\phi_c = .11$). Additional chi-square tests of independence were performed independently for the German and American samples. Analysis of the German sample revealed no significant relation between mind-set condition and perspective orientation ($\chi^2(2) = 1.88$, $p = .39$, $\phi_c = .18$). In both the combined and German sample analyses, participants were just as likely to provide an other-oriented response in the difference mind-set condition as they were in the similarity mind-set and control conditions. However, analysis of the American sample did reveal a significant relation between perspective orientation ($\chi^2(2) = 6.93$, $p = .03$, $\phi_c = .23$). In all three mind-set conditions, participants most often took the self-oriented perspective. However, American participants in the similarity condition were more likely to provide an other-oriented response than those in either the control condition or the difference mind-set condition. Thus, despite the significance of the finding, the result is not consistent with the original study's research hypothesis.

¹ All tables can be found in Appendix E.

In order to remain consistent with the analysis methods of the original study, several independent samples t-tests were conducted. As with the chi-square tests, no support was found for the original study's hypothesis. As shown in Table E-2, in the combined American and German samples, participants primed with a difference mind-set were not more likely to provide other-oriented responses than were participants primed with a similarity mind-set, $t(125) = .09, p = .92, d = 0.8$, or control participants, $t(116) = -1.29, p = .20, d = -0.24$. Analyses were also performed independently for the German and American samples. In the German sample, participants primed with a difference mind-set were not more likely to provide other-oriented responses than were either participants primed with a similarity mind-set, $t(36) = -.88, p = .38, d = -0.29$, or control participants, $t(40) = .54, p = .59, d = 0.16$. Additionally, in the American sample, participants primed with a difference mind-set were not more likely to provide other-oriented responses than were participants primed with a similarity mind-set, $t(87) = .41, p = .68, d = 0.08$. However, they were more likely to provide an other-oriented response than control participants, $t(74) = -2.11, p = .03, d = -0.48$. Overall, the effect of condition was not significant in a one-way analysis of variance with combined German and American samples (ANOVA), $F(2, 182) = 1.17, p = .31, \eta^2 = .01$ or the German sample (ANOVA), $F(2, 55) = .92, p = .40, \eta^2 = .03$. However, there was a significant effect of condition in the American sample (ANOVA), $F(2, 124) = 3.58, p = .03, \eta^2 = .05$, which can be attributed to the mean differences between the similarity mind-set and control conditions.

The current study also largely failed to produce effect sizes comparable to those of the original study (see Table E-3). In the original study, the comparison of group

means between the difference mind-set and similarity mind-set conditions revealed a moderately strong effect size ($d = .59$); and the comparison of group means between the difference mind-set and control conditions also revealed a moderately strong effect size ($d = .48$). In the current study, the only effect sizes that were comparable were the effect size obtained when comparing the American sample means between the difference mind-set condition and control group ($d = .48$); and also the effect size obtained when comparing the combined German and American sample means between the difference mind-set condition and control group ($d = .86$). Because the current study also utilized chi-square tests of independence the corresponding effect size statistic, Cramer's V (ϕ_c), was calculated for each analysis. Analysis of the American sample produced the strongest effect size ($\phi_c = .23$).

CHAPTER 4

General Discussion

The purpose of the current study was to replicate the findings of Todd et al. (2011) via a direct replication. Analyses revealed no support for the research hypothesis explored in the original study; participants primed with a difference mind-set were not less likely to spontaneously adopt an other-oriented visual perspective than participants primed with a similarity mind-set or participants in a control condition. The only comparable findings between the replication attempt and the original study were the effect sizes between the means of the difference mind-set condition and control condition in the American sample and the combined American and German samples. Possible explanations for the failed replication attempt and limitations to the current study are discussed below.

Failure to Replicate

Because the project utilized the ‘Replication Recipe’ (Brandt et. al, 2014), replication success was defined and determined within the set parameters of the recipe. The success of the current study was based on effect sizes (i.e., if those obtained in the current study were comparable to those in the original study). Because similar effect sizes were not obtained, the current study can be marked as inconclusive. The inconclusive status of the project is justified by the substantial limitations discussed below.

Limitations and Future Directions

The most severe limitation affecting the outcome of the current study was small sample size. According to the previously mentioned power analysis, a group sample size $n=46$ was needed in order to be 80% confident that the null hypothesis has correctly been rejected. Independently, neither the American ($N=127$) nor the German ($N=58$) samples satisfied this requirement. Because the group sizes were so small and unequal, it is difficult to determine any significant relationships between mind-set condition and perspective orientation.

Another limitation could be the use of Amazon's MTurk as the venue for data collection. While the use of this website to recruit participants and collect data was largely an advantage (i.e., easy to create and distribute), it could also be viewed as a disadvantage. As a place for psychological studies to be conducted, MTurk is relatively new. The novelty of MTurk means a lack of acceptance and validation in some scientific circles. Also, much is still unknown about the MTurk worker population. Studies have attempted to capture a sense of what MTurk workers are like, but it is difficult to generalize them (Bates & Lanza, 2013; Paolacci & Chandler, 2014; Sharpiro, Chandler, & Mueller, 2013). Since much can still be learned about this population, it is difficult to determine what sample characteristics may have been driving the results in the current study. These results may not be representative of the general population. Instead they may only be representative of this singular population.

The current study's deviations from the method of the original study can also be deemed limitations. For example, the majority of the participants in the current study were American (68%) while all of the participants in the original study were German.

This difference in participants' nationality could be contributing unaccounted variance to the current study's sample data. Additionally, the original study was completed in a university setting, while the current study was completed online via Amazon's MTurk. This left the current study open to a sample more diverse in terms of age, location, profession, and various other individual differences typically not associated with university students. Thus, it is possible that the current study sampled a population largely different from the population sampled by Todd et al. (2011).

Additionally, the disparity between the results of the original study and the current study could be attributed to differences in administration, namely that the original study was conducted in person and the current study was conducted online. Previous research has found that data collected online via MTurk tends to produce nonequivalent results when compared to data collected in person (Gamblin, Winslow, Lindsay, Newsome, & Kehn, 2016).

In order to make a more conclusive ruling about the success of the current replication attempt, more participant data must be collected from the American and German samples. This will make it possible to increase the power of the study. Collecting more data via MTurk, with stricter worker qualifications, will help to augment the current sample size. Once more data has been collected an identical analysis will be applied to the larger sample.

Additionally, an in-person replication utilizing American college students may also be an appropriate way to assess replication success, assuming that college students in the United States and Germany are similar. By holding the procedure constant and only

changing the population, it becomes possible to determine if it is the population that matters. It should also help to determine if the diversity of the MTurk sample is an issue.

Conclusion

As before mentioned, because the data failed to produce effect sizes comparable to those of the original study, the current replication attempt cannot be classified as a success. The failure to produce the needed effect sizes can largely be attributed to small sample size, differing data collection venues (Amazon's MTurk vs. university setting), and the sampling of different populations (American vs. German; MTurk workers vs. university students). As a result of these limitations, the replication attempt has been designated as inconclusive. Following the collection of more data, the study will be revisited in order to determine the replication success of Todd et al. (2011).

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APPENDIX A:

The Replication Recipe (Brandt et al., 2014)

A 36-question guide to the Replication Recipe

The Nature of the Effect

1. Verbal description of the effect I am trying to replicate;
2. It is important to replicate this effect because;
3. The effect size of the effect I am trying to replicate is;
4. The confidence interval of the original effect is;
5. The sample size of the original effect is;
6. Where was the original study conducted? (e.g., lab, in the field, online)
7. What country/region was the original study conducted in?
8. What kind of sample did the original study use? (e.g., student, Mturk, representative)
9. Was the original study conducted with paper-and-pencil surveys, on a computer, or something else?

Designing the Replication Study

10. Are the original materials for the study available from the author?
 - a. If not, are the original materials for the study available elsewhere (e.g., previously published scales)?
 - b. If the original materials are not available from the author or elsewhere, how were the materials created for the replication attempt?
11. I know that assumptions (e.g., about the meaning of the stimuli) in the original study will also hold in my replication because;
12. Location of the experimenter during data collection;
13. Experimenter knowledge of participant experimental condition;
14. Experimenter knowledge of overall hypotheses;
15. My target sample size is;
16. The rationale for my sample size is;

Documenting Differences between the Original and Replication Study

For each part of the study indicate whether the replication study is Exact, Close, or Conceptually Different compared to the original study. Then, justify the rating.

17. The similarities/differences in the instructions are;
18. The similarities/differences in the measures are;
19. The similarities/differences in the stimuli are;
20. The similarities/differences in the procedure are;
21. The similarities/differences in the location (e.g., lab vs. online; alone vs. in groups) are;
22. The similarities/differences in remuneration are;
23. The similarities/differences between participant populations are;
24. What differences between the original study and your study might be expected to influence the size and/or direction of the effect?;
25. I have taken the following steps to test whether the differences listed in #24 will influence the outcome of my replication attempt;

[Exact | Close | Different]
[Exact | Close | Different]
[Exact | Close | Different]
[Exact | Close | Different]
[Exact | Close | Different]
[Exact | Close | Different]
[Exact | Close | Different]
[Exact | Close | Different]

Analysis and Replication Evaluation

26. My exclusion criteria are (e.g., handling outliers, removing participants from analysis);
27. My analysis plan is (justify differences from the original);
28. A successful replication is defined as;

Registering the Replication Attempt

29. The finalized materials, procedures, analysis plan etc of the replication are registered here;

Reporting the Replication

30. The effect size of the replication is;
31. The confidence interval of the replication effect size is;
32. The replication effect size [is/is not] (circle one) significantly different from the original effect size?
33. I judge the replication to be a(n) [success/informative failure to replicate/practical failure to replicate/inconclusive] (circle one) because;
34. Interested experts can obtain my data and syntax here;
35. All of the analyses were reported in the report or are available here;
36. The limitations of my replication study are;

APPENDIX B:
The Replication Recipe (Brandt et al., 2014) Responses

Nature of the Effect:

1. Verbal description of the effect I am trying to replicate: Participants primed with difference mind set were more likely to provide other-oriented responses than those primed with a similarity mind set ($d=0.59$) or control participants ($d=0.48$). Overall, the effect of condition facilitated perspective taking (partial $\eta^2 = 0.09$).
2. It is important to replicate this effect because: It is important to replicate this effect because it is believed to have theoretical value. That differences are more likely to prime other-oriented responses seems counter intuitive. Focusing on similarities is known to elicit other-oriented responses.
3. The effect size of the effect I am trying to replicate is: $d=0.59$, $d=0.48$, $\eta^2 = 0.09$
4. The confidence interval of the original effect is: Not reported
5. The sample size of the original effect is: $n=82$
6. Where was the original study conducted? (e.g., lab, in the field, online) This study was conducted in a psychology lab in Germany.
7. What country/region was the original study conducted in? The original study was conducted in Germany.
8. What kind of sample did the original study use? (e.g., student, Mturk, representative) The original study used a sample of undergraduate students from a German university.
9. Was the original study conducted with paper-and pencil surveys, on a computer, or something else? The original study was conducted via computer.

Designing the Replication Study:

10. Are the original materials for the study available from the author? The original materials are available from the original author.
 - a. If not, are the original materials for the study available elsewhere (e.g., previously published scales)? N/A
 - b. If the original materials are not available from the author or elsewhere, how were the materials created for the replication attempt? N/A
11. I know that assumptions (e.g., about the meaning of the stimuli) in the original study will also hold in my replication because: The stimuli were carefully translated into English and provide very straightforward direction to participants.

12. Location of the experimenter during data collection: The study is conducted on a computer, so the experimenter is not present during the data collection.

13. Experimenter knowledge of participant experimental condition: There is no experimenter blindness in this study.

14. Experimenter knowledge of overall hypotheses: As the study will be conducted on Mturk, this will eliminate any potential for experimenter effects.

15. My target sample size is: 200

16. The rationale for my sample size is: The original study had a smaller sample size (n=82). In order to increase the statistical power of the study and get a better idea of the true effect size, I would like a sample size of at least 200. Using data collection sites such as Mturk for replication may make this much more plausible than only using undergraduate student samples.

Documenting Differences between the Original and Replication Study:

For each part of the study indicate whether the replication study is Exact, Close, or Conceptually Different compared to the original study. Then, justify the rating.

17. The similarities/differences in the instructions are: [Exact | Close | Different]

This is an attempt at a direct replication; as a result instructions for the study will be kept the same. The only difference is that the instructions will be translated into English for an American population, whereas the original study used German instructions a German population.

18. The similarities/differences in the measures are: [Exact | Close | Different]

There are no differences. The original author provided the measures from the original study and those will be used in the replication, to keep the studies as identical as possible. Only the languages will be different to accommodate for the differences in the populations.

19. The similarities/differences in the stimuli are: [Exact | Close | Different]

Again, to keep the studies as identical to each other as possible, there will be no manipulation of the stimuli. The goal is to simulate the experience of the original study.

20. The similarities/differences in the procedure are: [Exact | Close | Different]

As in the original study, the procedure will be kept the same for the direct replication.

21. The similarities/differences in the location (e.g., lab vs. online; alone vs. in groups) are: [Exact | Close | Different] The major difference between the two studies is that the original study took place in Germany, and the replication will take place in the United States.

22. The similarities/differences in remuneration are: [Exact | Close | Different] There was no indication of payment in the original study. In the replication study, participants will be recruited online using Amazon's Mechanical Turk, and will be paid as workers on the site.

23. The similarities/differences between participant populations are: [Exact | Close | Different] Similarities between populations include (expected) ages of participants. Differences include nationality; the population of the original study was German and the population of the replication study will be American. The population of the original study is also a student population. The population for the replication study will be obtained on Mturk, which is assumed to be more diverse than an undergraduate student sample.

24. What differences between the original study and your study might be expected to influence the size and/or direction of the effect?: The differences in the populations are expected to be the largest influencers of the size and direction of the effect (i.e. nationality, student vs. not student). It must also be taken into account how the data is collected (on a university campus vs. on Mturk). The differences in data collection methods may also have an effect on the size and direction of the effect.

25. I have taken the following steps to test whether the differences listed in #24 will influence the outcome of my replication attempt: I have reviewed relevant literature on

the issue, including studies investigating potential issues with recruiting research samples from Mturk.

Analysis and Replication Evaluation

26. My exclusion criteria are (e.g., handling outliers, removing participants from analysis): Participants will be removed from analysis if they do not fully complete the study or if their response cannot be categorized as self-oriented or other-oriented – as was done in the original study.

27. My analysis plan is (justify differences from the original): I plan to analyze the replication as the original study was analyzed.

28. A successful replication is defined as: one in which the effect size is comparable to that of the original study's effect size.

Registering the Replication Attempt

29. The finalized materials, procedures, analysis plan etc of the replication are registered here: Open Science Framework

Reporting the Replication

30. The effect size of the replication is: see Table 3

31. The confidence interval of the replication effect size is: N/A

32. The replication effect size [is/is not] (circle one) significantly different from the original effect size?

33. I judge the replication to be a(n) [success/informative failure to replicate/practical failure to

replicate/**inconclusive**] (circle one) because: the obtained sample was too small to make any conclusive decisions.

34. Interested experts can obtain my data and syntax here: Open Science Framework

35. All of the analyses were reported in the report or are available here: Open Science Framework

36. The limitations of my replication study are: small sample size, differing data collection venues (Amazon's MTurk vs. university setting), and sampling of different populations (American vs. German; MTurk workers vs. university students)

APPENDIX C:
Mindset Primes (Todd, Hanko, Galinsky, & Mussweiler, 2011)

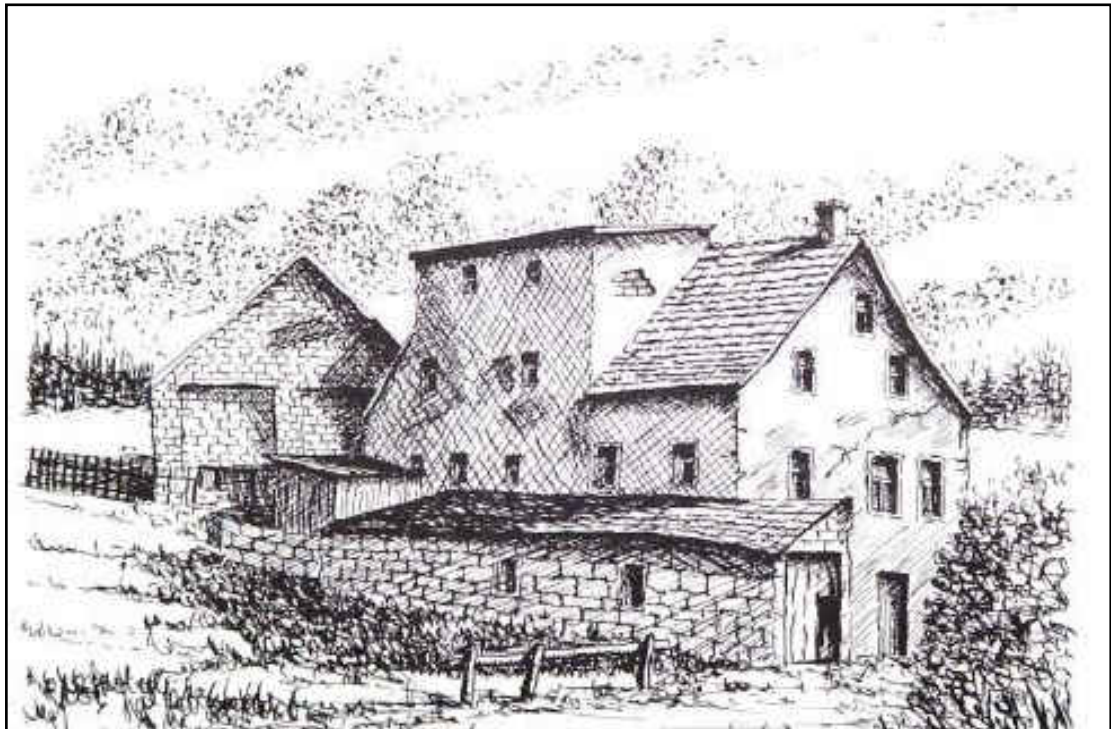
Control Condition - Picture 1

Instructions: Using the space provided, please list 3 attributes to describe the picture appearing below.

1. _____

2. _____

3. _____



Control Condition – Picture 2

Instructions: Using the space provided, please list 3 attributes to describe the picture appearing below.

1. _____

2. _____

3. _____



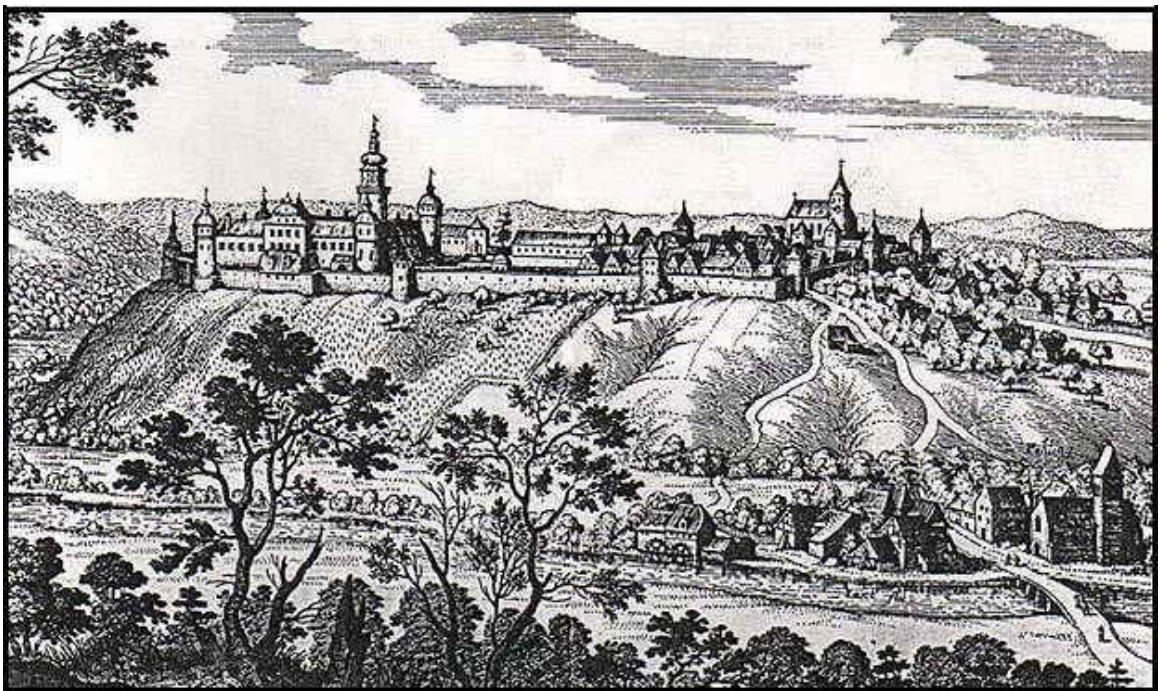
Control Condition – Picture 3

Instructions: Using the space provided, please list 3 attributes to describe the picture appearing below.

1. _____

2. _____

3. _____



Control Condition – Picture 4

Instructions: Using the space provided, please list 3 attributes to describe the picture appearing below.

1. _____

2. _____

3. _____



Difference-Mind-Set Condition – Picture Pair 1

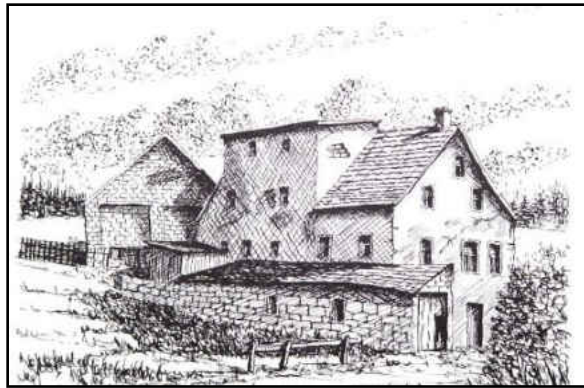
Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are different from each other.

1. _____

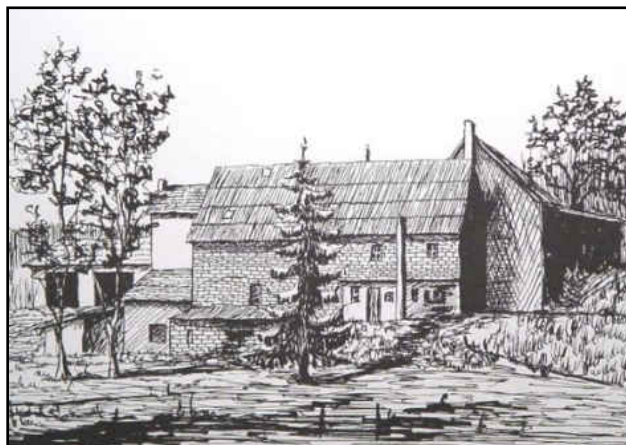
2. _____

3. _____

A)



B)



Difference-Mind-Set Condition – Picture Pair 2

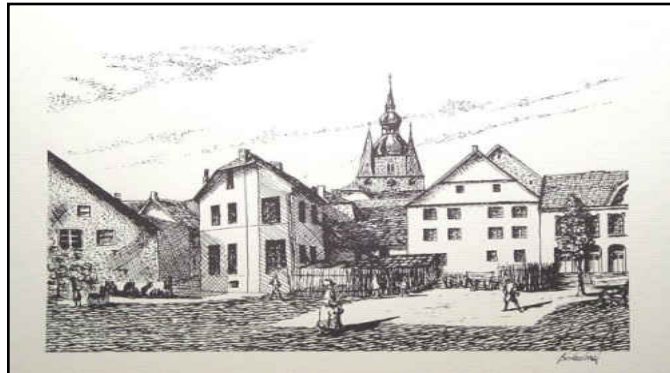
Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are different from each other.

1. _____

2. _____

3. _____

A)



B)



Difference-Mind-Set Condition – Picture Pair 3

Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are different from each other.

1. _____

2. _____

3. _____

A)



B)



Difference-Mind-Set Condition – Picture Pair 4

Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are different from each other.

1. _____

2. _____

3. _____

A)



B)



Similarity-Mind-Set Condition – Picture Pair 1

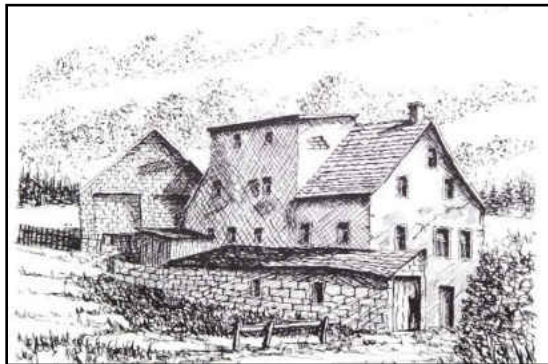
Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are similar to each other.

1. _____

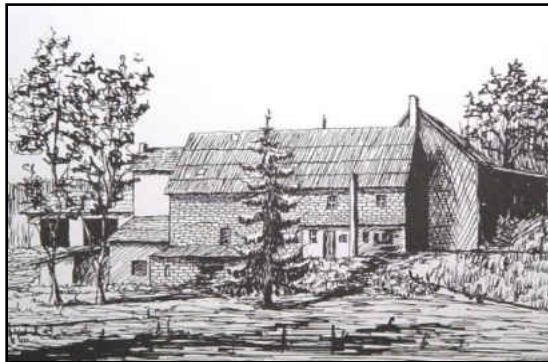
2. _____

3. _____

A)



B)



Similarity-Mind-Set Condition – Picture Pair 2

Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are similar to each other.

1. _____

2. _____

3. _____

A)



B)



Similarity-Mind-Set Condition – Picture Pair 3

Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are similar to each other.

1. _____

2. _____

3. _____

A)



B)



Similarity-Mind-Set Condition – Picture Pair 4

Instructions: Using the space provided, please list 3 ways in which the pictures appearing below are similar to each other.

1. _____

2. _____

3. _____

A)



B)



APPENDIX D:

Perspective-taking Photograph (Tversky & Hard, 2009)



APPENDIX E:

Tables

Table 1

Results of Chi-square Test and Descriptive Statistics for Perspective Taking by Mind-Set Condition

	Mind-Set Condition	Perspective Taken	
		Self-Oriented	Other-Oriented
German*	Similarity	13 (81.3%)	3 (18.8%)
	Difference	15 (68.2%)	7 (31.8%)
	Control	12 (60.0%)	8 (40.0%)
American**	Similarity	30 (58.8%)	21 (41.2%)
	Difference	24 (63.2%)	14 (36.8%)
	Control	32 (84.2%)	6 (15.8%)
Combined***	Similarity	43 (64.2%)	24 (35.8%)
	Difference	39 (65.0%)	21 (35.0%)
	Control	44 (75.9%)	14 (24.1%)

Note. * $\chi^2(2) = 1.88, p = \text{n.s.}$ ** $\chi^2(2) = 6.93, p = .03.$ *** $\chi^2(2) = 2.34, p = \text{n.s.}$ Numbers in parentheses indicate row percentages.

Table 2

Mean Percentage of Other-Oriented Location Descriptions as a Function of Condition

	Mind-set Condition		
	Control	Similarity	Difference
German	40%	18%	31%
American	15%	41%	36%
Combined	24%	35%	35%

Table 3

Effect Sizes of Current Study & Todd et al. (2011)

	Current Study	Todd et al. (2011)
German	$\phi_c = .18, p = .39$	N/A
	Difference-Similarity $d = -0.29$	Difference-Similarity $d = 0.59$
	Difference-Control $d = 0.16$	Difference-Control $d = 0.48$
	$\eta^2 = .03$	$\eta^2 = .09$
American	$\phi_c = .23, p = .03$	
	Difference-Similarity $d = 0.08$;	
	Difference-Control $d = -0.48$	
	$\eta^2 = .05$	
Combined	$\phi_c = .11, p = .30$	
	Difference-Similarity $d = 0.86$	
	Difference-Control $d = -0.24$	
	$\eta^2 = .01$	