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# Exploring the implications of construal level for social comparison theory

Kathryn Irene Gaetz Bruchmann  
*University of Iowa*

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EXPLORING THE IMPLICATIONS OF CONSTRUAL LEVEL FOR SOCIAL  
COMPARISON THEORY

by

Kathryn Irene Gaetz Bruchmann

An Abstract

Of a thesis submitted in partial fulfillment of the  
requirements for the Doctor of Philosophy degree  
in Psychology in  
the Graduate College of  
The University of Iowa

May 2013

Thesis Supervisor: Professor Jerry Suls

## ABSTRACT

This dissertation examines the relationship between two social psychological theories: Social Comparison Theory (Festinger, 1954) and Construal Level Theory (Liberman & Trope, 1998). More specifically, this research assesses how a person's level of mental abstraction (i.e., construal level) might influence the way social comparison information from individuals or aggregates is used to form self-evaluations. Typically, comparison information from individuals (versus information about aggregates) is given disproportionate weight when forming self-evaluations; in other words, there is a "local" (i.e., individual) dominance effect in the utilization of social comparison information (e.g., Zell & Alicke, 2010). It is predicted that with greater mental abstraction (i.e., higher construal level), this tendency will be reversed, and instead comparison information from aggregates will be relied upon more when evaluating the self. In other words, abstract mindsets (versus concrete mindsets) should result in a "global" (i.e., aggregate) dominance effect in the weighting of social comparison information.

Six studies examine the influence of construal level on the use of aggregate versus individual social comparison information. Two pilot studies provide initial evidence that abstract mindsets lead to a global dominance effect. The generalizability of these effects is tested by providing comparison feedback on different tasks (Study 1 and Study 4), testing the influence of different construal mindset manipulations (Study 2), as well as manipulating the psychological distance (an antecedent of construal level; e.g., Trope and Liberman, 2003) of social comparison targets (Studies 3 – 4). Additionally, the relative weighting of individual versus aggregate comparison targets is directly tested by comparing self-evaluations with only aggregate comparison information, and with both aggregate and individual comparison information (Study 2 and Study 4).

Results across all studies indicate that while social comparisons with better off or worse off targets typically result in robust effects, evidence of local dominance and effects of construal manipulations are much more subtle. Theoretical implications for

Social Comparison Theory and Construal Level Theory and practical implications are discussed.

Abstract Approved:

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Thesis Supervisor

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Date

EXPLORING THE IMPLICATIONS OF CONSTRUAL LEVEL FOR SOCIAL  
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Kathryn Irene Gaetz Bruchmann

A thesis submitted in partial fulfillment of the  
requirements for the Doctor of  
Philosophy degree in Psychology in  
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The University of Iowa

May 2013

Thesis Supervisor: Professor Jerry Suls

Graduate College  
The University of Iowa  
Iowa City, Iowa

CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph. D. thesis of

Kathryn Irene Gaetz Bruchmann

has been approved by the Examining Committee  
for the thesis requirement for the  
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In memory of my best friend  
Mariah Ann Becker (1982-2002)  
whose enthusiasm for life  
continues to inspire me daily

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CHAPTER 1  
THE IMPLICATIONS OF CONSTRUAL LEVEL ON SOCIAL COMPARISONS  
WITH INDIVIDUALS AND AGGREGATES

**Overview**

Social Comparison Theory (Festinger, 1954) and Construal Level Theory (Liberman & Trope, 2008) are two conceptual approaches with many implications for social judgments and behavior. Social Comparison literature posits that information from others influences people's self-perceptions while construal level theory argues that the level of abstraction adopted to construe the world can influence judgments and decisions. Both theories have been studied extensively; however, implications that both fields have for each other have not yet been systematically assessed. In this document, some of the connections between the two theories are described. Specifically, this project will explore the idea that construal level moderates self-evaluative effects of social comparison information from individual versus aggregate targets.

Roadmap of the Present Document

First, a broad overview of Social Comparison Theory will be presented. An in-depth analysis will focus on work assessing how individuals use comparison information from single individuals versus information about several individuals or a group, in aggregate form. One phenomenon, known as the Local Dominance Effect (e.g., Zell & Alicke, 2010), will be highlighted. According to some researchers, this is the tendency for individuals to rely more on comparison information from individuals than aggregates when forming self-evaluations. Demonstrations of and explanations for the local dominance effect will be discussed, as well as changing definitions of the effect in light of subsequent research. Then, moderators of the local dominance effect will be discussed.

Construal Level Theory will be presented as a new potential moderator for the influence of individual versus aggregated comparison information; thus, the construal literature will be reviewed at length.



Finally, this introduction will outline general predictions about the effects of construal level on the use of comparison information from individuals and aggregates, and will provide an overview of the six following studies that tested the predictions.

### **Social Comparison Theory**

Everyday decisions about preferences or behaviors require people to evaluate their personal abilities and attitudes. These decisions can range from trivial (e.g., a man must decide whether or not he can run to the bus stop quickly enough to catch an approaching bus, or if he should wait for the next one), to important (e.g., a college student might only choose to be a pre-med major if she believes that she is sufficiently smart or capable to manage the heavy workload). Just as judgments and evaluations of objects and other people are heavily influenced by the context (e.g., Tversky & Kahneman, 1974), judgments about the self rarely are ever made in a vacuum. Self-evaluations are greatly dependent on information about other people. Social Comparison Theory, as originally proposed by Festinger (1954), suggests that people rely on their relative standing compared to other people in order to evaluate their own personal traits, attitudes, opinions, and abilities. In evaluating themselves relative to others, people can look to those who are better-off (referred to as “upward comparison targets”) or worse off (referred to “downward comparison targets”). For example, the man described above might decide not to run to catch the bus because a younger and more agile employee (i.e., an upward target) has decided to wait for the next bus. Or, the college student might decide to declare herself pre-med because she knows she performs better than most of her classmates (i.e., downward targets) in biology and chemistry courses.

While social comparisons were originally thought (e.g., Festinger, 1954) to be of utility only when people have no diagnostic objective information available, subsequent research suggests people use comparison information to form self-evaluations even when objective information is readily available. For example, Klein (1997) demonstrated that when evaluating health risks, participants’ relative standing with others (e.g., above

versus below average) had an influence on their self-judgments above and beyond their absolute risk likelihood information (e.g., 30% for 60% likelihood). Similarly, rank or relative income level or socio-economic status (SES) predicts health outcomes like sleep latency and chronic stress (Adler, Epel, Castellazzo, & Ickovics, 2000) and overall life satisfaction better than objective income level and SES (Boyce, Brown, & Moore, 2010). In many cases, comparison information actually changes the way objective or absolute information is interpreted; this suggests that while objective information should be diagnostic, people do not view it as such (e.g., Buckingham & Alicke, 2002). In an illustrative study, Alicke, Zell, and Bloom (2010) demonstrated that people who received an objectively lower score on a task felt better about themselves when they also had downward social comparison information. Other research has demonstrated that comparative standing (relative to another individual or average), but not objective performance on a task, predicted helping (or hurting) behavior of future participants or competitors (Klein, 2003).

According to Festinger (1954), to make accurate self-evaluations, comparisons should only be made with targets (whether individuals or aggregates) who are similar on attributes relevant to the particular ability or opinion. As in the examples of the man running to the bus or the student deciding to declare a pre-med major, deliberate social comparisons can be used by making use of a “proxy” (Wheeler, Martin, & Suls, 1997). For example, the man considering whether or not to run to the bus might seek out information from others the same age or fitness level. The Proxy Model (Wheeler, Martin, & Suls, 1997) suggests that a similar other is used to compare with to predict one’s own success or failure. Comparison targets can be sought out to evaluate beliefs and preferences (Suls, Martin, & Wheeler, 2000), in addition to ability (Goethals & Darley, 1977, Wheeler, et al., 1997). However, social comparisons are also often used even when the targets are not relevant or do not provide diagnostic information (e.g., Mussweiler, Rüter, & Epstude, 2004a, Sweeny & McFarlan, 2005).

Mussweiler and colleagues (2004a) demonstrated that social comparisons can even be triggered spontaneously and unconsciously. In a representative study, they subliminally primed college-student participants with athletic (e.g., Michael Jordan) or un-athletic (e.g., Pope John Paul II, who was still living at the time of data collection) targets before asking them to rate their own athleticism. These targets exist outside the limits of normal levels of athleticism and therefore should not possibly be relevant comparison targets for participants; yet, being primed with these targets still exerted a substantial influence on participants' judgments. That is, participants who had been primed with Michael Jordan felt worse about their own athletic ability than participants who had been primed with the Pope, even though participants were unaware that they had been presented with any comparison information. Other research has demonstrated that people consciously and deliberately compare with dissimilar and irrelevant targets as well (Gilbert, Giesler, & Morris, 1995; Mussweiler, Rüter, & Epstude, 2004b; Sweeney & McFarlin, 2005).

Just as there are many ways to obtain social comparison information, there are a variety of possible outcomes of comparing oneself to a target. In some cases (such as the examples of the man or the student above), social comparisons result in self-evaluations displaced away from a target (i.e., contrast). That is, comparing to an upward target, self-evaluations will become less favorable, and comparing to a downward target, self-evaluations will become more favorable. In a now classic example of contrast effects, Morse and Gergen (1970) had a confederate pose as a job applicant waiting for an interview with a participant. In one condition, the confederate was an upward target (referred to as "Mr. Clean" by the authors) because of his tidy professional look; in the other condition, he was disheveled and unkempt downward comparison target (referred to as "Mr. Dirty"). Participants in this study who were also interviewing for the job rated themselves more positively when they waited with Mr. Dirty, and less positively when they had waited with Mr. Clean.

Social comparisons also can also produce assimilation, or the displacement of self-evaluations *towards* a comparison target. In one study, college students' self-evaluations were higher when reading about a very successful student (an upward comparison target), if the target's successes appeared to be attainable (Lockwood, & Kunda, 1997). In another study, participants rated themselves to be more moral after comparing with the facebook profile of an ostensibly morally upstanding classmate (Bruchmann & Scherer, unpublished data).

Whether comparisons produce contrast or assimilation depend on several variables. One factor is the extremity of the comparison target: while extreme targets lead to contrast effects, more moderate targets lead to assimilation (Mussweiler et al., 2004a). Increased ambiguity of the comparison target (Herr, Sherman, & Fazio, 1983), attainability of the target's characteristics (Lockwood & Kunda, 1997), and perceived similarity between the self and the target (Mussweiler & Bodenhausen, 2002; Mussweiler et al., 2004b) are also more likely to increase assimilation. According to the Selective Accessibility Model (Mussweiler, 2001), the result of a social comparison depends on what type of information is most accessible or easiest to recruit. Thus, assimilation occurs because the comparer recruits similarity-consistent information about the self and the target, and dissimilarity testing results in contrast (Mussweiler, 2001; Mussweiler et al., 2004b).

#### Comparing with Individuals versus Aggregates

Social comparison research has traditionally focused on how people compare themselves to other discrete individuals or groups, but not both types of information simultaneously. Yet, in daily life, people almost always have access to a plethora of comparison targets along a continuum from individuals to a national average. For example, imagine a student who receives feedback about an exam in her psychology class. She might compare grades with her roommate, or learn about the objective scores of a few friends or classmates; but she also might know the average performance of the

whole class. In some cases, she might even be given information about the averages of classes from previous semesters. With the endless supply of comparison information available, the question is how do we combine and interpret multiple sources and types of comparison information to form a self-evaluation?

Imagine the student in the above example earned a 90% on her exam and the class average was 75%. However, her roommate's score was a 95%. Thus, this student has downward comparison information about the average of the class and upward comparison information about an individual (i.e., her friend). Logically this student should feel happy with her performance, which is objectively an "A" and above average. However, some research indicates that the student is likely to be relatively dissatisfied with her grade because her friend's superior performance has a disproportionate effect on her self-perceptions. This is an example of the Local Dominance Effect, or the tendency to give disproportionate weight to "local" or individual comparison information rather than "global" or aggregate comparison information when both types of information are available (Alicke, Zell, & Bloom, 2010; Buckingham & Alicke, 2002; Zell, & Alicke, 2010). This effect is surprising given that comparison information from an average or aggregate is in most cases more diagnostic for self-evaluations; learning about an aggregate of 100 others should certainly have more validity than information from just one other, just as getting a score on a one-item test is not likely to be as valid a measure of comprehension as a test with multiple items. However, evidence suggests that people have a tendency to excessively rely on comparison information from individuals which can subsequently lead to biased self-evaluations.

#### Evidence of the Local Dominance Effect

In the laboratory, Buckingham and Alicke (2002) were the first to systematically test the local dominance effect by providing participants with bogus scores and comparison information on a lie detection task. Participants were informed that they had performed either above or below average on the task, and had also performed worse or

better than a co-participant. In the key conditions, these two types of comparison information (i.e., individual or average) were in opposing directions; one was an upward comparison and one was a downward comparison. By comparing self-evaluations across these conditions, the researchers determined that relative standing with the average was not reflected in ratings of satisfaction, task performance, or general ability. Instead, comparison information from individual co-participants was used more when forming self-evaluations. Recently, another study demonstrated that the local dominance effect even extends to judgments of perceived risk (Zell & Alicke, in press). Participants perceived that they were at higher (lower) risk if they were told they were above (below average) unless they received opposing information from co-participants in the study.

In a separate series of studies, Zell and Alicke (2009a) showed that the Local Dominance Effect does not require comparisons with individual comparison targets, but just “local” targets. They accomplished this by using an *intragroup* comparison as the local target, and *intergroup* comparison as the global target. That is, participants were told they performed better or worse on a verbal reasoning task than most students at their university (*intragroup*) and that their university performed better or worse than most schools in the study (*intergroup*). Participants rated themselves more favorably if they performed well in a low-performing school. Alicke and colleagues (2010) extended this research by showing that the difference between intra- and intergroup comparisons does not even have to be meaningful. In each session of the study, ten participants were split arbitrarily into two groups of five, and after completing a lie detection task, they were either told that they performed fifth overall (i.e., intergroup comparison) and worst in their own group (i.e., intragroup comparison), or sixth overall and best in their own group. Despite the fact that all ten people were in the same room, participants who performed better relative to their own arbitrary group but worse in terms of the other group rated their performance as better even though they performed objectively worse on the task.

### Changing Interpretations

While the phrase “Local Dominance Effect” implies that local comparison targets are relied upon more than global comparison targets when forming self-evaluations, recently, it has come to light that the effect should be considered differently. Instead, local comparison targets are simply relied upon *more than they should be*. Thus, it is possible that comparing with a global target like an average or aggregate can still influence self-evaluations, even if local targets like an individual or small group have an unwarranted influence on self-judgment. Rather than testing for the traditional conception of “Local Dominance”, now, research is focused on testing the relative weighting of individual comparison targets. To do so, self-evaluations in conditions with only average comparison information are compared to conditions with both average and individual targets. Throughout the present work, this type of test or effect will be referred to as “Relative Local Dominance”. Moreover, instances in which self-evaluations depend more on comparison information from aggregates will be referred to as demonstrations of “Global Dominance”.

### Related Effects

There are a number of studies which test relative standing with local versus global groups in the real world. These related effects, known as the Frog Pond Effect, or Big-Fish-Small-Pond effect have provided support for the Local Dominance Effect. In the context of the education system, Marsh (1987; Marsh & Parker, 1984; Marsh & Hau, 2003) has demonstrated consistent findings from low and high ability students and cross-cultural samples that above average students at low-quality schools have more positive academic self-concepts than below average students at high quality schools, even after statistically controlling for aptitude test scores. In other words, students’ academic self-concepts are more influenced by their immediate and local comparisons (with-in their school) than their objective abilities (their school quality compared to others). McFarland and Buehler (1995) showed that this effect is (unsurprisingly) even stronger among

students who explicitly report caring more about their status within their local comparison group (e.g., their class) than global standards (e.g., the state or national average). These effects on students' academic self-concept are important because they may influence the decisions that students make about what to do after high school; for example, whether or not they should further their education or what type of school or university they should attend. In fact, there is evidence that for college students, grade point average (a within- university, local comparison of sorts) is more predictive of career choice than the caliber or quality of the university (a between-university, global comparison) (Davis, 1966).

An effect known as the Local Ladder Effect (Anderson, Kraus, Galinsky, & Keltner, 2012) suggests that the respect and admiration that individuals receive from face-to-face peer groups (i.e., their relative "local" standing) is more predictive of subjective well-being than income level. This effect was demonstrated with college student, community, and MBA student samples, utilizing correlational, longitudinal, and experimental methods; these results suggest that indeed "money does not buy happiness", but maybe instead, "more money than others buys happiness".

#### Explanations for the Local Dominance Effect

Zell and Alicke (2010) offer an evolutionary explanation for the local dominance effect. People have maintained close relationships with small groups of peers because, evolutionarily speaking, interdependence with a closely knit in-group was (and perhaps still is) necessary for survival (Moreland, 1987). Despite the fact that our immediate needs have changed over the centuries, people are still motivated to associate with small interdependent groups that can help distinguish the self (and the in-group) from the others (i.e., out-groups) (e.g., Brewer, 1991). As Zell and Alicke (2010) observe, having global or general comparison information was not even possible across much of history (i.e., before technological advances that link everyone in virtual social networks), nor would it have been useful. For example, if trying to estimate one's chances of winning a



competition for food or resources, why compare oneself to anyone but the immediate competitors? Even in modern day, it is more sensible for college students to compare themselves to their classmates when competing for top grades in a curved course, internships, or even date prospects. It could be argued that people just learn to compare themselves to small groups of close others like classmates, co-workers, or immediate families because for many traits or skills, there are no other options (Zell & Alicke, 2010).

An alternative explanation for the local dominance effect is that abstract information is considered to be less diagnostic than concrete information to most people (e.g., Borgida & Nisbett, 1997). Because aggregates do not typically offer distribution information (i.e., an average is just one number, based on many unknown individual scores) they can be seen as vague and less specific than discrete information from individuals. However, Zell and Alicke (2010) tested this alternative by offering concrete individual comparative feedback and concrete (by way of a detailed distribution information) aggregate comparative feedback. They found that the local dominance effect still emerged; that is, the individual comparative feedback was more influential than the concrete distribution feedback on ratings of self-concept. In fact, in another study, participants rated aggregate comparison as “more useful” to them when making self-evaluations although they were more influenced by the local comparison information (Buckingham & Alicke, 2002).

#### Moderators of the Local Dominance Effect

Several factors appear to moderate the local dominance effect, including self-enhancement or self-protection. According to the Self-Esteem Maintenance Model (Tesser, 1988), people are intrinsically motivated to maintain a positive view of themselves. Therefore, people should be inclined to strategically use comparison information in order to boost, or at least maintain their self-image. In fact, Buckingham and Alicke (2002) found that the local dominance effect was stronger when the available

aggregate comparison information posed a threat (i.e., it was an upward comparison) to participants' self-image, than when the aggregate comparison information was positive in nature. However, there is little evidence to suggest that people use favorable average or aggregate information to self-enhance even in the face of self-esteem threatening individual comparison information (Zell & Alicke, 2010). That is, being above average does not protect someone from the negative implications of an individual upward (i.e., superior) comparison target. Another potential moderator of the local dominance effect is the proximity of the targets to the self; in one set of studies (Buckingham & Alicke, 2002), local dominance effects were larger if the local target really was "local" (i.e., in the same room versus down the hall); however, other research has suggested that even when there is no proximity to local targets, the effect is still evident (Zell & Alicke, 2009a).

### **Construal Level Theory**

This dissertation posits that constructs from another social psychological theory, the construal level model, may contribute a novel moderator of the influence of individual versus aggregate comparisons: whether comparison information is construed abstractly or concretely. According to Construal Level Theory (Trope & Liberman, 1998; 2003), mental representations of the physical and social world depend on how abstractly or concretely it is viewed. Abstract construals are more gist-based, structured, and represent the core or central attributes of a task or an object. Concrete construals are more specific, and represent the incidental or peripheral attributes of a task or an object. Any object, situation, or action can be viewed at different levels of abstraction, and the meaning can greatly change. For example, "writing a dissertation" can be construed abstractly as the achievement of expertise in one's field (i.e., abstract construal), or it can be seen concretely as typing words into a document (i.e., concrete construal). Construal level has an impact on not only the way people view, but also how they interact with the world.

## Demonstrations of Construal Level

### Central versus Peripheral Characteristics

Trope and Liberman (2000) demonstrated that construal level mindset can influence purchasing decisions by changing the way people view consumer products. Participants in an abstract mindset were more likely to base purchasing decisions on the core, central features of a radio alarm clock (e.g., the sound quality of the radio) while participants in a concrete mindset were more likely to buy the radio alarm clock based on its detailed, peripheral qualities (e.g., the aesthetics of the digital display). Another study showed that abstract construals cause people to rely more on “gist” memory and lead to better decision making than concrete construals in situations of “information overload” (Fukukura, Ferguson, & Fujita, 2012).

### Desirability versus Feasibility of Goals

Differential construal levels can also change the way in which goals are interpreted. An abstract construal level leads to thinking about the purpose and the desirability of goals; whereas, a low construal level leads to concrete thoughts of the feasibility and how to attain the goal (Fujita & Sasota, 2011; Freitas, Gollwitzer, & Trope, 2004; Liberman, & Trope, 1998). Fujita and Sasota (2011) found that priming an abstract mindset helped dieters to resist eating a piece of chocolate cake if the desirability of their goal to lose weight was activated.

### Power versus Powerlessness

Smith, Wigboldus, and Dijksterhuis (2008) also found that higher more abstract construal levels led participants to have greater feelings of subjective power and control over their environment than participants with lower more concrete mindsets. Interestingly, the reverse was found to be true as well; priming “power” led participants to view other unrelated information more abstractly (Smith & Trope, 2006). Other research has found that cues, such as lowering the pitch of one’s voice, that signify power also lead to more abstract thinking (Stel, van Dijk, Smith, van Dijk, & Djala, 2012).

### Consistency versus Flexibility

Abstract construal levels have also been shown to result in greater consistency in attitudes and a more structured sense of self (e.g., Ledgerwood, Trope, & Liberman, 2010; Conway & Peetz, 2012). In one line of research, Conway and Peetz (2012) demonstrated that abstract mindsets activated participants' "moral identity" which led to judging others' moral indiscretions more harshly. However, concrete mindsets led to participants (who identify as being moral) exhibiting more of their own immoral behaviors, demonstrating a more flexible moral identity. In another study, Vess, Arndt, and Schlegel (2011) demonstrated that self-esteem was less influenced by negative contextual cues when participants were in an abstract mindset; again, demonstrating consistency in an abstract mindset and flexibility in a concrete mindset.

### Category versus Exemplar

Abstract mindsets also are associated with the use of more categories. Studies suggest that targets are seen as more stereotypical of their social groups when judgments are made through the lens of an abstract mindset (McCrea, Wiber, & Myers, 2011), and that more trait inferences are made about individuals when viewed through a high-level construal. People placed in abstract mindsets also are more likely to rely on normative information; Ledgerwood and Callahan (2012) demonstrated greater conformity to group norms when thinking abstractly.

### Global versus Local Processing

Changes in construal level do not only influence what information is brought to mind, but it also can change how perceptual information is processed (Liberman & Förster, 2009). In one study, Liberman and Förster (2009) tested the effect of construal level on the Navon letter task (Navon, 1977). In this task, a participant sees a letter (for example the letter "H") made up of smaller other letters (for example the letter "F"), and the participant is asked to report which letter he or she sees (see Figure 1). When participants are in an abstract, high construal level mindset, they are quicker to identify

and more likely to report seeing the “global” letter (in this case the letter “H”). However, when they are in a concrete, low level construal mindset, they are more likely to report the “local” letter (the letter “F”).



Figure 1. Sample Item from the Navon Letter Task (Navon, 1977).

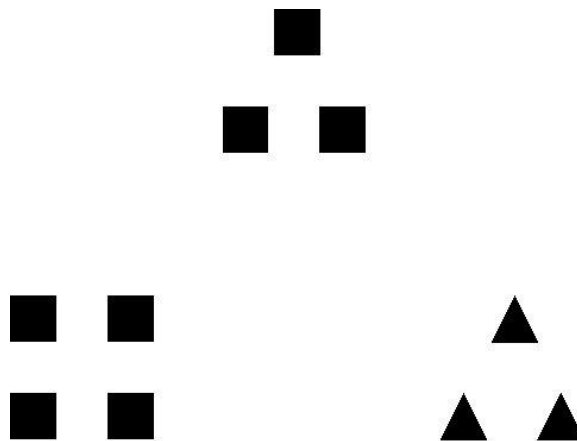


Figure 2. Sample Item from the Kimchi-Palmer-figures-task (Kimchi & Palmer, 1982).

Another perceptual processing task frequently used is the Kimchi-Palmer-figure-task (Kimchi & Palmer, 1982; see Figure 2.) Instead of letters, this task requires participants to decide whether the global shape (in this case, a triangle) of a figure is more dominant than the local shape (in this case, squares). They do this by choosing which of two other figures are more similar to the target: one of the same global shape (a triangle) or one with the same local shape (the squares).

### Determinants of Construal Level

#### Individual Differences

Construal level at any given time can depend on a number of factors. For instance, construal level can be operationalized as an individual difference, in addition to a situationally determined factor. Some people might be more likely to always see the “big picture”, whereas other people might be more likely to focus more on the details. The Behavioral Identification Form (BIF; Vallacher & Wegner, 1987, 1989) measures people’s chronic tendencies to construe the world abstractly or concretely. The scale consists of a list of behaviors that are then explained by either the “process” of the behavior or the “purpose” of the behavior. For example, “locking a door” could be seen either concretely as the process of “putting a key in the lock” or more abstractly as the purpose of “securing the house”. Someone who chronically has a high construal level, then, is more likely to select the more abstract purpose of each behavior.

#### Mindset Priming

In addition to individual differences, there are a variety of contextual determinants of construal level. First and perhaps most obviously, is the ability of an “abstract” or “concrete” prime to induce a high or low level of construal mindset. Freitas, Gollwitzer, and Trope (2004) developed a task in which people think about achieving a goal (e.g., maintaining personal health) in different ways. If asked to think about “why” achieving the goal is important, participants are induced into a more abstract, purpose-focused, high level of construal. However, if participants are asked to think about “how” to achieve the

goal, a more concrete, process-focused, low level of construal is induced. Another task shown to create differential construal level mindsets provides participants with an item (e.g., a dog) and asked to either generate an example of the item (say, a beagle or poodle) or something the item is an example of (say, a house pet or a mammal) (Fujita, Trope, Liberman, & Levin-Sagi, 2006; also Ledgerwood, Trope, & Chaiken, 2010). Generating an exemplar is considered to be a concrete detail, and is associated with a low level of construal; generating a category, however, is considered to be a more abstract representation and thus is associated with a high level of construal. Finally, processing tasks like the Navon letter task (Navon, 1977) or the Kimchi-Palmer Figure Task (Kimchi & Palmer, 1982), can be used as a manipulation of construal level by asking participants either to identify the “global” letter or shape to induce an abstract high level of construal or the “local” letter or shape to induce a concrete low level of construal (e.g., Smith et al., 2008).

### Sensory Experience

Experiencing stimuli through “proximal senses” such as touch or taste has been shown to activate a more concrete mindset than experiencing through “distal senses” like vision or hearing (Shpizaizen & Liberman, 2013). Changes in visual perspective have also demonstrated shifts in construal level: viewing actions through a first person versus a third person perspective have been shown to activate abstract versus concrete representations of actions on the individual difference measures like the behavioral identification form mentioned above (Libby, Shaeffer, & Eibach, 2009; Agerstrom, Bjorkland, & Carlsson). These effects have been proven to be bi-directional, as abstract or concrete interpretations of behaviors lead to more third person versus first person imagery (Libby et al., 2009).

### Psychological Distance

Another factor tied to construal level is *psychological distance*. Psychological distance refers to how far or near to the self an object is hypothetically, spatially,

temporally, or socially. Changes in psychological distance fundamentally change the representations of an item such that psychologically proximal items are construed more concretely and specifically, whereas psychologically distant items are construed more abstractly to get the “big picture” (e.g., Liberman & Trope, 1998).

#### Hypothetical Distance

Hypothetical distance can be thought of much in the same way as “abstractness” or “concreteness.” The more hypothetical or imagined an event is, the more distant it is considered from the self. For example, describing an event in terms of “if” instead of “when” it will happen, can lead to a more abstract view of the event (Liberman & Trope, 2008). Similarly, an event that has a low likelihood of taking place is seen more abstractly than an event that has a higher likelihood of happening. For example, *winning* the lottery is very unlikely to happen to the average person, so it might be construed in abstract terms as being the cause of happiness, or living a carefree life. *Buying* a lottery ticket, on the other hand, is very likely for the average person to experience, and thus it can be construed more concretely as picking out numbers, scratching off circles, or paying the store clerk. While hypotheticality has an influence on construal level, the reverse is true as well. In one study, Wakslak and Trope (2009) showed that participants with an abstract (high construal level) mindset rated events as less likely to take place than those with a concrete (low construal level) mindset. In other words, as their construal levels increased, so did the perceived hypotheticality of events.

#### Spatial Distance

Spatial distance, or how far away something is in space, also has an impact on construal level (see Henderson, Wakslak, Fujita, & Rohrbach, 2011). The further away something is geographically, the more abstract our representation of that item, (or place, or person, or event) is. Spatial distance has been shown to influence how the behaviors of other people are interpreted; reading the same description of a person who is supposedly at the participant’s university versus someone from the same university but who is



studying abroad for a semester in Florence, changes the nature of impressions formed of the person (Rim, Uleman & Trope, 2009). While more trait inferences were made for psychologically distant targets (i.e., targets studying in Florence), more complex and context dependent impressions were formed for psychologically proximal targets.

Similarly, other research (Henderson, Fujita, Trope, & Liberman, 2006) has shown that people are more likely to attribute spatially distant targets' behaviors to their dispositional attributes; while spatially proximal targets' behaviors are thought to be more dependent on the situation. In other words, increased spatial distance was related to an increase in the Correspondence Bias, or the tendency to make dispositional attributions and neglect the context of others' behaviors (see Gilbert & Malone, 1995). Henderson and colleagues (2006) also found that typical events (such as the likelihood that students would sleep an average of 6.2 hours per night) were considered more likely in spatially distant locations than spatially near locations. Conversely, atypical events (such as the likelihood that a forecasted temperature would be several degrees below normal) were considered more likely for spatially near locations than spatially distant. These two findings combine to support the idea that spatially distant events are construed more abstractly and coherently; that is, less variation is expected across spatially distant events.

#### Temporal Distance

Temporal distance refers to how far something is away in time. Immediate events are construed more concretely, whereas events in the past or future are construed more abstractly. Ledgerwood, Trope, and Chaiken (2010) showed that people's attitudes about future events are more consistent, while attitudes about immediate events are more flexible and context dependent. In one study, participants read a message ostensibly written by a co-participant either for or against a policy that was to go into effect "next week" or "next year". When the policy was to go into effect in the near future, it was more temporally close to the participants, which led to a lower level, more context

dependent construal. This led participants to shift their attitudes to become more similar to their co-participants' attitudes. However, when the policy was to go into effect in the distant future, participants' construal levels were more abstract, and their attitudes were not correlated with those of their co-participants. Temporal distance also influences choices: temporally near decisions are more likely to be based on feasibility of an outcome, whereas temporally distant decisions are based more on the desirability of an outcome (Liberman & Trope, 1998).

### Social Distance

Social Distance refers to the degree of similarity between a person and a target. According to Construal Level Theory, the more similar two people are, the closer their social distance, and the more detailed and concrete their construal levels will be. The empirical literature on how people perceive in-groups and out-groups differently provides support for this idea. Out-groups are believed to be more homogenous and are described in more abstract terms while in-groups are considered to be more diverse, and to have unique attributes (e.g., Jones, Wood, & Quattrone, 1981). Nan (2007) showed that participants were more likely to be persuaded by a message when taking the perspective of a socially distant other (i.e., the average college student) than a socially proximal other (i.e., a participant's best friend). In another study, imagining a close relationship versus a formal relationship with a target influenced perceptual processes and responses to the Navon (1977) letter task (Liberman & Förster, 2009). Participants who had a "socially proximal" mindset focused more on the "local" letters (i.e., the small letters) of each figure, whereas participants who had a "socially distant" mindset focused more on the "global" letter (i.e., the "big picture").

Although each of these different types of psychological distance has been shown to be associated with higher construal levels and more abstract representations of the world, it is important to note that they are all associated with each other as well. That is, thinking about one type of psychological distance or abstraction, activates other types of

psychological distance (Bar-Anan, Liberman, Trope, & Algom, 2007), but the effects of different types of distance are not additive (Maglio, Trope, & Liberman, 2012).

### **Present Research**

#### **Social Comparison and Construal Level**

To date, construal level theory's relevance to social comparison research has only been considered in a limited way. Förster and colleagues (2008) found that global processing (induced by a Navon letter task manipulation; Navon, 1977) led to greater assimilation to a target that was presented either subliminally or explicitly, whereas local processing led participants to contrast away from a primed target. With this one exception, construal level theory and social comparison theory have remained parallel lines of research. This is curious, especially considering those who research social comparisons between similar others (or in-group members) and dissimilar others (or out-group members) which is presumably a psychological (i.e., social) distance manipulation of comparison targets (e.g., Blanton, Crocker, & Miller, 2000; Brown, Novick, Lord, & Richards, 1992). Blanton and colleagues (2000) demonstrated that people are more likely to contrast from out-group members and assimilate towards in-group members when receiving feedback on a threatening task. Similarly, Brown and colleagues (1992) showed that increased similarity (i.e., social proximity) to a comparison target led to greater assimilation. Though these two experiments were considered to be informative about the mechanisms of assimilation and contrast in social comparison, the role of psychological distance or construal level was never addressed. Furthermore, the results of these two experiments are contradictory to the predictions of construal level theory (e.g., Förster, 2008; Förster, 2009; Förster & Dannenburg, 2010); according to some research, increased social distance should increase similarity testing and assimilation, yet, the comparison literature finds that social distance leads to contrast. Systematically examining the influence of construal level on the use of social comparison information is necessary to reconcile these discrepant findings, as well as to understand how construal

level changes the interpretation of comparison feedback, or information from more complex targets. The present dissertation provides a foundation for examining the interrelations between these two theories by testing the moderating role of construal level in using comparison feedback information from aggregate or average targets. While other research has not examined this relationship, there is some evidence that construal level influences the type of information people use when making decisions. In three studies, Ledgerwood, Wakslack, and Wang (2010) demonstrated temporally distant (i.e., abstract) purchasing decisions rely more on average opinions or ratings, whereas temporally proximal decisions instead relied on anecdotal evidence or opinions from individuals. Accordingly, it is predicted in the present research that self-evaluations made in abstract mindsets will lead to relying on information from averages, whereas concrete mindsets will lead to relying more on information from individuals.

#### General Predictions

The aim of the present research is to examine how construal level influences the use of different types of social comparison information. More specifically, two pilot studies and four studies investigated the effects of construal levels and psychological distance on the use of comparison information from individuals versus aggregates. The primary hypothesis across these studies is that inducing a more abstract construal level will cause people to rely more on comparison information from aggregate or average targets. In other words, because comparison information from an aggregate or average is seen as more abstract or “global”, it is predicted that an abstract mindset will result in a “global” dominance effect; better than aggregate feedback is expected to lead to more favorable self-evaluations than worse than aggregate feedback, regardless of the direction of individual comparison information.

However, in a concrete (or psychologically proximal) mindset, it is predicted that the influence of comparison information from individuals will have relatively disproportionate influence on self-evaluations. In other words, concrete (i.e., “local”)

mindsets will lead to the use of “local” targets and lead to a “local” (or “relatively local”) dominance effect; relative standing with average will matter less than relative standing with individual co-participants when forming self-evaluations.

#### Overview of Research

In two online pilot studies (Bruchmann & Evans, 2013), construal level was manipulated directly by inducing an abstract or concrete mindset (Freitas, et al., 2004) before providing participants with individual and/or aggregate social comparison information about a trivia task. As predicted, higher construal levels led to a global dominance effect (Pilot Study 1) such that relative standing with aggregate comparison information better predicted self-evaluations than standing with individual comparison information. In Pilot Study 2, the effects of abstract construal levels were assessed on receipt of only individual comparison information, or both individual and average comparison information. As in the Pilot Study 1, a global dominance effect emerged when participants received both individual and aggregate comparison information; participants’ self-evaluations depended on whether they had performed better or worse than the aggregate, not their co-participant. However, when participants only had comparison information from individuals, self-evaluations did not differ; this suggests that abstract mindsets allow for contrast effects and not only assimilation as other researchers have indicated (e.g. Förster, 2008).

Study 1 tested the generalizability of the pilot studies by providing both individual and aggregate comparison information on a novel task, and by testing the paradigm in a lab setting rather than online. Study 2 tested the use of a different manipulation of construal level (Fujita et al., 2006) and also included conditions in which there was only comparison information available about the aggregate performance. By comparing self-evaluations from these conditions and those with both aggregate and individual comparison information, the true influence of individual comparison information could be assessed; In other words, Study 2 tested the *relative* local dominance of individual

comparison targets. In Studies 3 and 4, the psychological distance of the comparison information was manipulated; specifically, the temporal distance (Study 3) and spatial distance (Study 4). In addition to assessing the influence of psychological distance on self-evaluations, participants' processing level (e.g., global versus local) was also assessed.

CHAPTER 2  
INITIAL EVIDENCE THAT ABSTRACT MINDSETS LEAD TO GLOBAL  
DOMINANCE EFFECTS

**Pilot Study 1**

To begin an initial investigation of the influence of construal level on the use of comparison information from individuals versus aggregates, participants were administered a manipulation to induce either an abstract or concrete mindset before receiving bogus feedback about their performance on a task, as well as the average performance score (of peers), and the performance score of one other participant. Participants then provided ratings of performance satisfaction. It was predicted that participants in an abstract mindset would be more influenced by their relative standing with the average, rather than their standing compared to an individual.

Method

Participants and Design

Participants (N=144) were recruited and compensated for completing a study about “knowledge and health” using Amazon’s Mechanical Turk (MTurk; Amazon, 2011). Data obtained via MTurk demonstrate psychometric properties similar to laboratory samples (For reviews of MTurk procedures, see Buhrmester, Kwang, & Gosling, 2011). Data from 33 participants were excluded for a variety of reasons outlined later. Participants included in the final analyses (N=111) were 50.5% female, 63.1% age 25 or over, and 57.7% had an Associate’s degree or higher. Participants were randomly assigned to cells of a 2 (construal mindset: abstract, concrete) x 2 (comparison information: aggregate downward and individual upward, aggregate upward and individual downward) between participants factorial design.

## Procedure

After being directed to the study, all participants completed a difficult 20-question trivia task (See Appendix A). Each question had two answer options that were designed to be sufficiently difficult that both options seemed equally likely (e.g., “Which state has a lower elevation, Florida or Nebraska?”) in order to create uncertainty about how well participants performed. The instructions emphasized that there would be no bonus for answering the questions correctly, and asked participants not to look up any of the answers while completing the task. After completing the trivia questions, participants completed a construal manipulation designed to induce either an abstract (high construal) or concrete (low construal) mindset (adapted from Freitas, Gollwitzer, & Trope, 2004; see also Sanna, Lundberg, Parks, & Chang, 2010; Wakslak & Trope, 2009). All participants were asked to think about “improving and maintaining one’s physical health”. Participants in the abstract condition were asked to list three goals that “improving or maintaining [their] physical health could help [them] meet” (i.e., *why* should one maintain good health?). In the concrete-mindset condition, they were asked to list three things they could do “in order to improve or maintain [their] physical health” (i.e., *how* can one maintain health?).

After completing the construal manipulation, participants were given bogus feedback on their trivia task performance, as well as the (purported) performance of an individual other participant (ostensibly the last participant to complete the task online), and the (purported) average performance of all participants that had been tested online to date. All participants were told that they answered 63% of the trivia questions correctly, information which was “sandwiched” between two other scores. In other words, there was always one upward comparison target (77%) and one downward (49%); which was the individual or aggregate comparison target was manipulated between participants.



### Dependent Measure and Manipulation Check

Participants were asked to rate their satisfaction with their performance (1= *very dissatisfied*, 7= *very satisfied*). Participants were also asked how honest they were on the trivia task (i.e., did they look up any answers?) (1= *not at all honest*, 7= *completely honest*). Demographic information about age, gender, and level of education was also collected. Finally, participants were asked to recall their scores and the scores of the other participant and the average before being probed for suspicion and debriefed.

### Results

Data were excluded for mis-remembering the direction of comparison information, suspicions that the feedback was bogus, or reporting dishonesty (i.e., they admitted looking up most or all answers) on the trivia task. Participants reported being almost completely honest on the trivia task ( $M=6.73$ ,  $SD=.62$ ); 88 of 111 participants reported not looking up any answers. Participants scored an average of 11.77 ( $SD=2.5$ ) out of 20 correct on the trivia task, which did not differ across conditions (n.s.).

### Manipulation Check

To ensure that the construal manipulation worked, two independent coders, blind to condition, rated participants' responses to "why" or "how" they should improve or maintain their health (-1= *purpose/why*, +1= *process/how*). For each participant, codes were averaged across the three responses, and across both coders' ratings (which were highly correlated,  $r=.87$ ) to create one score reflecting construal level. As expected, participants in the abstract construal condition gave relatively more purpose-related responses (e.g., "to live longer";  $M=-.73$ ,  $SD=.58$ ) while participants in the concrete construal condition gave relatively more process-related responses (e.g., "exercise more"  $M=.91$ ,  $SD=.22$ ;  $t(109)=18.62$ ,  $p<.001$ ,  $d=3.57$ ).

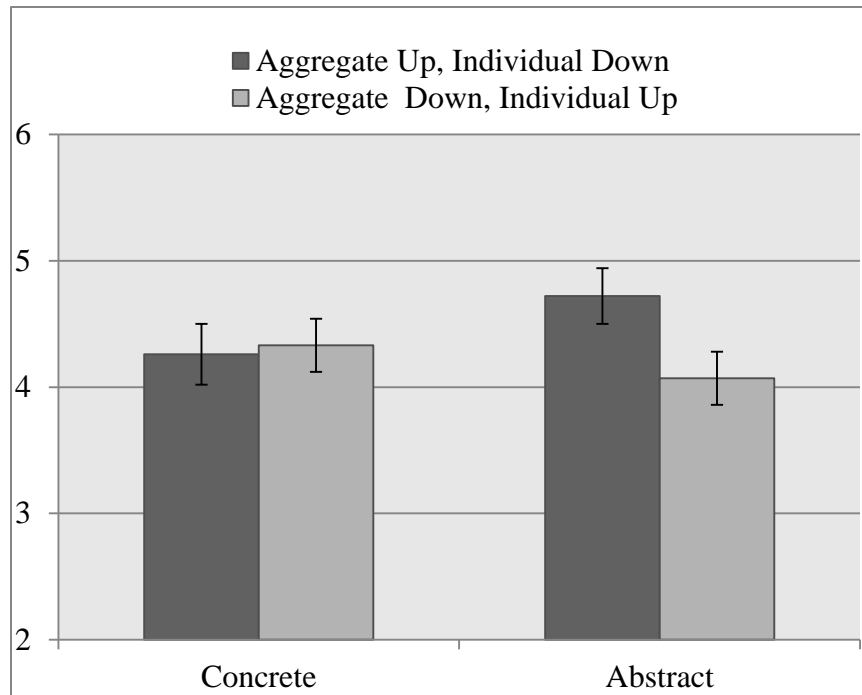


Figure 3. Pilot Study 1 mean satisfaction ratings by comparison condition and construal mindset.

### Satisfaction

Participants' ratings of performance satisfaction were submitted to a 2 x 2 analysis of variance, which revealed a significant construal-level x comparison feedback interaction ( $F(1,107)=4.88, p=.029, \eta_p^2=.04$ ) (See Figure 3). Pairwise comparisons indicated that participants with an abstract mindset who received individual upward (and therefore aggregate downward) comparison information reported feeling more satisfied with their performance ( $M=4.67, SD=1.58$ ) than participants in the aggregate upward (and individual downward) comparison condition ( $M=3.65, SD=1.35; p=.009, d=.69$ ). However, for those in the concrete-mindset conditions, there were no differences between the individual upward/aggregate downward ( $M=4.13, SD=1.40$ ) and the aggregate upward/individual downward ( $M=4.41, SD=1.50$ ) comparison conditions (n.s.). In other words, when participants were induced to think abstractly before receiving performance

feedback, aggregate comparison information had a greater effect on self-evaluations than individual comparison information—demonstrating a global dominance effect.

#### Comparison Information Recall Accuracy

One possible reason the self-evaluations of participants in the abstract mindset conditions were more affected by “global” comparison information is that this information may have been more memorable to these participants. Manipulation check data were coded to assess the accuracy of participants’ memory for the individual and aggregate feedback (*accurate*= 1, *not accurate*= 0). A chi-square test revealed that more participants in the abstract-mindset condition accurately recalled the exact aggregate feedback information (62% accurate) than participants in the concrete-mindset condition (33% accurate),  $\chi^2(1, N=111)=8.99, p=.003$ . However, participants in the abstract condition were no more likely to remember the individual comparison information than participants in the concrete condition ( $\chi^2(1, N=111)=2.12, p=.145$ )

#### Discussion

According to Zell and Alicke (2010), people disproportionately use comparison information from individuals; however, Pilot Study 1 shows that when primed to construe stimuli more abstractly, participants instead rely on the more global, average comparison information when making self-evaluations. Analyses of manipulation check data suggest that one potential reason is that participants thinking abstractly are better at recalling global rather than local comparison information. This indicates that when thinking abstractly, participants may process information about global comparisons with greater depth than information regarding local comparisons.

While no differences between comparison conditions emerged in the concrete-mindset conditions, this pattern could be considered consistent with a *relative* local

dominance effect. If participants in the concrete-mindset condition had relied only on the comparison information that was most diagnostic regarding their abilities on the trivia task, the same pattern of differences should have emerged between these cells as was observed in the abstract-mindset condition. In other words, above-average participants *should* have been more satisfied with their performance than below-average participants. In the concrete-mindset condition, if comparison information about a single individual had a disproportionate influence (i.e., if a relative local dominance effect was acting), differences would be seen in the opposite direction or there would be no differences between conditions (as we demonstrated).

### **Pilot Study 2**

Consistent with predictions, Pilot Study 1 demonstrated a global dominance effect when participants processed comparison information while in an abstract but not in a concrete mindset. However, the process by which this shift in comparison standards operates remains unclear. Manipulation check data from Pilot Study 1 suggest that higher levels of construal caused participants to shift focus from the more “local” individual comparison information to the more “global” aggregate comparison information; yet, it is unclear if people are processing global information more carefully. Another possibility is that an abstract mindset caused participants to assimilate their self-assessment towards rather than contrast away from the individual target. Förster (2009) demonstrated that people primed to process information globally (i.e., people with an abstract mindset) are more likely to generate similarities between items than those primed to process locally (i.e., with a concrete mindset). People have also been proposed to assimilate their self-concept towards a primed target when in an abstract or global processing mindset (Förster, 2009).

Pilot Study 1 was not designed to determine whether more abstract levels of construal caused participants to merely shift attention to the aggregate comparison information when making self-evaluations, or if the abstract mindset also prompted assimilation towards the individual targets. To clarify what processes were operating, a new set of conditions for Pilot Study 2 was created in which participants only received information about individual comparison targets. If participants respond differentially when aggregate comparison information was absent versus present, it can be determined whether construal level influences the perceived utility and importance of aggregate comparisons. However, if similar satisfaction levels are reported whether aggregate comparison information was absent versus present, that would indicate that an abstract mindset was producing assimilation towards the individual comparison target.

## Method

### Participants and Design

One hundred forty-seven people were recruited via Mturk and paid for completing a study on “knowledge and relationships”. Data from 18 participants were dropped because they reported not understanding the feedback (i.e., thinking their participant numbers were their scores on the task), recognizing the feedback to be false, or having participated in the first study, leaving a sample of 129 participants. Participants included in the final analyses were 60.5% female, 75.2% age 25 or over, and 58.1% had at least an Associate’s degree. Participants were randomly assigned to cells of a 2 (individual comparison target: upward, downward) x 2 (aggregate comparison target: present, absent) between participants factorial design.

## Procedure

The procedures used in Pilot Study 2 were largely similar to those of Pilot Study 1. Participants completed a difficult 20 question trivia task. Because many Mturk workers complete multiple studies, and Mturk offers no way to screen for prior participation, we used 20 new questions. However, the format of the task was the same—a difficult question with two equally plausible answer options (see Appendix B). After completing the trivia task, participants were given a construal priming manipulation similar to the one used in Pilot Study 1 (adapted from Freitas, Gollwitzer, & Trope, 2004). While the structure of the task remained the same, participants in Pilot Study 2 were asked to think about “improving and maintaining positive relationships”. In Pilot Study 2, all participants completed an abstract construal mindset induction, and were asked to list three goals that positive relationships would help them reach (i.e., “why” have positive relationships).

As in Pilot Study 1, after the construal manipulation, participants received feedback about the trivia task. Again, participants received (bogus) feedback about their own performance (63%) as well as the score of another (fictitious) individual comparison target (either 77% or 49%). Participants in the aggregate feedback conditions also received (fictitious) comparison information about the average score of all previous participants (77% or 49%). If a participant received comparison information from both an individual and an aggregate target, the participant’s score was always “sandwiched” between the two pieces of comparison information (a better and a worse score).

## Dependent Variables and Manipulation Check

Participants were asked to rate their satisfaction with their performance (1= *very dissatisfied*, 7= *very satisfied*). Next, participants were asked how honest they were on the trivia task (1= *completely dishonest*, 7= *completely honest*). They were then asked to

recall their score, and the other scores provided to them. Finally, participants were probed for suspicion.

## Results and Discussion

Participants reported being very honest ( $M=6.91$ ,  $SD=.38$ ) on the trivia task; 121 of 129 participants reported being completely honest on the task. Participants answered an average of 10.09 ( $SD=2.18$ ) trivia questions correctly; actual performance on the trivia task did not differ across conditions (n.s.).

### Manipulation Check

To ensure that the construal manipulation worked, one coder (who also coded responses for Pilot Study 1) rated participants' responses to "why" they should improve or maintain their relationships ( $-1 = \textit{purpose/why}$ ,  $+1 = \textit{process/how}$ ); again, scores were averaged across the three responses to create one score reflecting construal level. Because all participants were in the "why" condition, it was anticipated that all responses would be more purpose- rather than process- related. A one sample  $t$ -test comparing the average to zero suggests that this was indeed the case ( $M=-.45$ ;  $SD=.69$ ;  $t(128)= 7.41$ ,  $p<.001$ ,  $d=1.31$ ). These ratings did not differ across conditions (n.s.).

### Satisfaction

Ratings of satisfaction were submitted to a 2 x 2 analysis of variance. A significant interaction between individual comparison direction and average comparison presence emerged ( $F(1,125) = 8.35$ ,  $p = .005$ ,  $\eta_p^2 = .063$ ) (see Figure 4). Participants in the individual upward comparison condition were significantly less satisfied when they had only individual comparison information ( $M=3.25$ ,  $S.D.=1.52$ ) than when they also received downward average comparison information ( $M=4.16$ ,  $SD=1.65$ ;  $F(1, 125)= 4.89$ ,  $p=.029$ ,  $\eta_p^2=.04$ ). Participants with only downward individual comparison information

were marginally more satisfied ( $M=3.92$ ,  $SD=1.47$ ) than when upward average comparison information also was provided ( $M=3.14$ ,  $SD=1.65$ ;  $F(1, 125)= 3.52$ ,  $p=.063$ ,  $\eta^2=.03$ ). In other words, the inclusion of average comparison information in an opposing direction changed the use of individual comparison information.

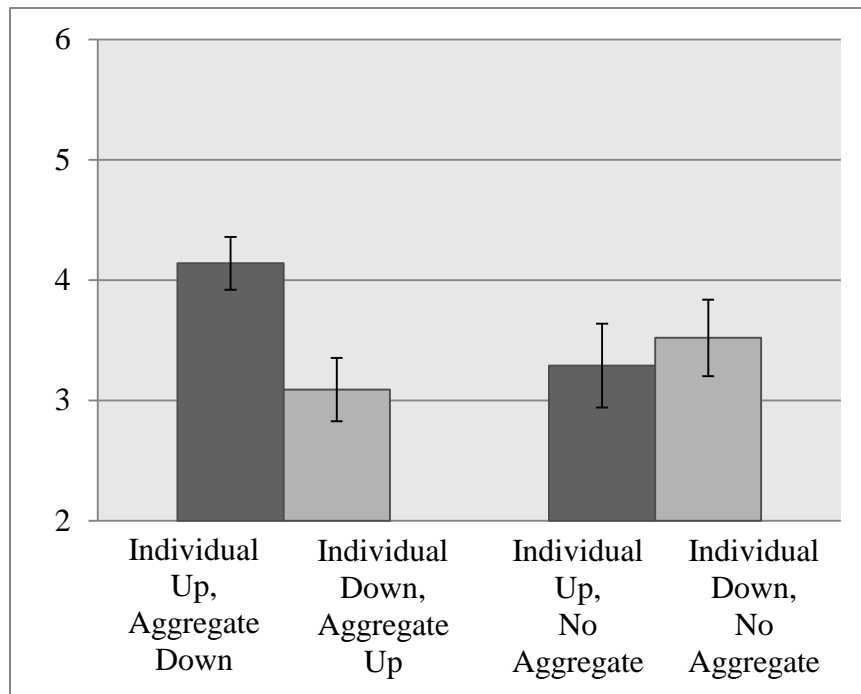


Figure 4. Pilot Study 2 mean satisfaction ratings by aggregate comparison and individual comparison.

By including conditions in which there was no average comparison information, we were able to determine that a high level of construal not only changed the outcome of the local dominance effect, but also changed the focus of comparison information from “local” to “global” information.



## General Discussion

Both pilot studies demonstrate a global dominance effect when participants were primed to construe comparison information abstractly. In Pilot Study 1, when in an abstract mindset, people were more satisfied with their performance on a difficult trivia task when they performed above average, and less satisfied when they performed below average, regardless of how an individual co-participant (a local comparison) performed. However, in a concrete mindset, ratings of satisfaction did not differ as a function of whether people believed they were above or below average (and whether an individual co-participant ostensibly performed worse or better on the task). These results provides some initial evidence that construal level moderates the use of aggregate versus individual comparison information in forming self-evaluations. Specifically, when people are induced to construe information abstractly, evaluations of their personal performance may be more reflective of their standing relative to the average of their peers, regardless of how they compare to another specific individual, demonstrating a global dominance effect.

There was no clear evidence for a local dominance effect in Pilot Study 1. While our results are not inconsistent with a relative local dominance effect, Pilot Study 1 did not include conditions that would allow us to draw conclusions about the relative weighting of individual comparison information on self-evaluations. As previously mentioned, calculating the *relative* impact of an individual comparison target requires a set of conditions in which there was no individual target; then, by comparing self-evaluations in response to only an aggregate target to those receiving both an aggregate and an individual, the true weighting of the individual target could be determined.

Some research (e.g., Förster, 2009) suggests that an abstract mindset leads to similarity testing and therefore assimilation to a target or prime. Thus, the results of Pilot

Study 1 might have been interpreted as satisfaction being based on assimilation toward individual (rather contrasting away from aggregate) comparison targets. However, by including conditions in Pilot Study 2 in which no aggregate comparisons were provided, we were able to determine how an abstract mindset influenced comparisons only to individual targets. When participants only had one type of comparison information available, they did not demonstrate assimilation effects; ratings of satisfaction were not different whether participants had an upward or downward comparison target. In contrast, when comparison information from both individual and aggregate targets was available, an above-average performance led to greater performance satisfaction than a below-average performance. This pattern of results suggests that an abstract mindset was not prompting assimilation towards the comparison targets; instead, more evidence was found that an abstract mindset causes a shift in attention from “local” to “global” comparison information, when it is available. Whereas other research (e.g., Förster, 2009) demonstrates that abstract mindsets facilitate assimilation, the present findings suggest that this is not always the case.

CHAPTER 3  
EXPLORING THE GENERALIZABILITY OF THE INFLUENCE OF CONSTRUAL  
LEVEL ON THE USE OF COMPARISON INFORMATION FROM INDIVIDUALS  
VERSUS AGGREGATES

**Study 1**

The aim of Study 1 was to conceptually replicate Pilot Study 1 using different materials and in a different setting to test the generalizability of the effects of construal level on the use of aggregate and individual comparison information. While participants in Study 1 completed a construal level manipulation before receiving comparison feedback about a task, there were two key differences. Instead of receiving feedback about an online trivia task like in the pilot studies, participants in Study 1 received feedback about a lie detection task conducted in the laboratory. The lie detection task, which was described as being indicative of a desirable trait known as social perceptiveness, is presumably more self-relevant than a test of random and difficult trivia; thus, measuring responses to comparison information on this task would allow for greater generalizability of results. Participants in Study 1 were also completing the lie-detection task in the presence of a co-participant from whom they received comparison information. While findings are inconclusive as to whether the presence of a co-actor is necessary to demonstrate a local dominance effect (e.g., Buckingham & Alicke, 2002; Zell & Alicke, 2010), it is possible that having truly local (i.e., from a neighboring desk) comparison information is more conducive for local dominance effects.

Self-Evaluations

As in both pilot studies (and the remaining studies in this document), the main dependent measure in Study 1 is participants' satisfaction. However, other self-evaluations were also measured. Specifically, participants were also asked to rate their performance and a more diffuse "trait" rating of their abilities. Rather than combine these

measures into one index of “self-evaluation”, the three will be treated separately. Other work (e.g., Buckingham & Alicke, 2002; Bruchmann & Suls, 2013) has demonstrated that affective ratings (like satisfaction), cognitive appraisals (like performance ratings), and diffuse trait ratings (like abilities) are not always influenced by comparison information in the same way. For example, more general traits that are not task specific (e.g., “ability” versus “test performance”) are less likely to be influenced by comparison information since they are more diffuse and have more information to draw from. Also, it has not been determined if different types of comparisons (e.g., individual or aggregate) may influence broader traits or ability ratings differently. While the different types of self-evaluations may not be uniformly influenced by comparison information, there are no a priori predictions of differences in patterns of responding.

### Predictions

Across all dependent measures, it was predicted that in an abstract mindset, participants should have more favorable self-evaluations if they had a better performance than the aggregate (and worse than a co-participant) than if they had a worse performance than the aggregate (and better than a co-participant). In other words, it was predicted that an abstract mindset should lead to a global dominance effect, as in both pilot studies. For participants in the concrete mindset conditions, however, it was predicted that participants’ self-evaluations should be more dependent on their relative standing with their co-participant than with the aggregate. In other words, outperforming a co-participant should lead to more favorable self-evaluations than being outperformed (regardless of the average); accordingly, evidence for a local dominance effect was predicted.

## Method

### Participants and Design

One hundred twenty four undergraduates completed a study of Social Perceptiveness in exchange for partial course credit. Data from 15 participants were removed before analyses for not following instructions (e.g., not completing the tasks) or for recognizing feedback to be bogus. This left a sample of 109 participants that were 66.7% female, 72.5% white, and average age 19.8 years ( $SD= 1.19$  years). Participants arrived to the lab in pairs and were randomly assigned to one of four conditions in a 2 (construal mindset: abstract, concrete) x 2 (comparison condition: aggregate up/individual down, aggregate down/individual up) factorial design.

### Materials and Procedure

Participants sat at individual computers and read a cover story adapted from Buckingham and Alicke (2002) that described an individual's level of "social perceptiveness" as being "predictive of relationship and career success". The cover story also explained that lie detection was a validated measure of social perceptiveness. Participants were told that they would complete a lie-detection task and that they would be receiving feedback about their performance. In the task, participants watched fifteen short video clips of college-aged persons making statements about topics ranging from campus safety to global warming. After each clip, participants decided whether they thought the person was lying or telling the truth. After completing the task, participants were asked to complete a task concerning personal relationships while the computer ostensibly tabulated their scores.

As in Pilot Study 2, participants completed a construal manipulation adapted from Freitas, Gollwitzer, and Trope (2004), in which they either wrote three statements about

why (in the abstract condition) they should maintain or improve their relationships or how (in the concrete condition) they could maintain or improve their relationship. After completing the construal manipulation, participants received (bogus) feedback about their performance on the lie detection task. Score reports indicated that participants correctly answered 63% of the lie detection questions. Participants also received two pieces of comparison information: one from their co-participant (who scored 77% or 49%) and one about the average of the first 214 participants (which was 49% or 77% respectively). In all cases, participants had two pieces of comparison information that were sandwiched around their own scores.

### Dependent Measures

After viewing the score feedback, participants rated their satisfaction with their performance on the task (1= *very dissatisfied*, 7= *very satisfied*), as well as their overall performance and social perceptiveness abilities (1= *very poor*, 7= *very good*). Participants were then asked to recall their scores on the lie detection task, as well as the scores for their co-participants and the average. Finally, participants were probed for suspicion and debriefed.

### Results

Two independent coders rated participants' responses to the how/why task; each statement was coded as either a process (-1), a purpose (+1) or both (0), and then were averaged across participants. The coders average ratings were highly correlated ( $r=.90$ ), and thus, were averaged to create a single index to represent construal level. As expected, participants in the abstract condition gave more "purpose" (i.e., "why") related responses ( $M=.85$ ,  $SD=.38$ ) than participants in the concrete condition ( $M=-.86$ ,  $SD=.25$ ;  $t(107)=27.88$ ,  $p<.001$ ,  $d=5.32$ ). The construal index in both the abstract and concrete condition were also significantly different from zero ( $p's<.001$ ). Participants' accuracy in

remembering their own scores or the comparison information did not differ by condition (n.s.). See Table 1 for correlations between the three dependent measures. See Table 2 for means and standard deviations of all dependent measures.

Table 1. Study 1 correlations of dependent measures.

	(1)	(2)	(3)
(1) Satisfaction	1		
(2) Performance	.51***	1	
(3) Social Perceptiveness	.12	.16	1

Note: \*\* indicates correlation is significant at  $p < .001$

Table 2. Study 1 mean self-evaluations by comparison condition and construal mindset.

Dependent Measure	Abstract Mindset		Concrete Mindset	
	Aggregate Up/ Individual Down	Aggregate Down/ Individual Up	Aggregate Up/ Individual Down	Aggregate Down/ Individual Up
Satisfaction	4.07 <sup>ac</sup> (1.17)	4.72 <sup>bc</sup> (1.03)	4.26 <sup>c</sup> (1.36)	4.33 <sup>c</sup> (.99)
Performance	4.15 <sup>d</sup> (.91)	4.62 <sup>ef</sup> (.62)	4.00 <sup>d</sup> (1.17)	4.43 <sup>df</sup> (.90)
Social Perceptiveness	5.15 <sup>g</sup> (1.03)	4.59 <sup>h</sup> (.73)	4.74 <sup>hi</sup> (1.18)	4.97 <sup>gi</sup> (1.03)

Note: Standard deviations appear in parentheses. Values without matching superscripts differ at  $p \leq .05$ .

## Satisfaction

A construal x comparison condition analysis of variance (see Figure 5) revealed a marginal main effect of comparison condition on participants' satisfaction such that participants who had aggregate downward and individual upward comparison information ( $M=4.53$ ,  $SD= 1.02$ ) were marginally more satisfied than participants who had aggregate upward and individual downward comparison information, ( $M=4.16$ ,  $SD= 1.25$ ;  $F(1, 105)= 2.74$ ,  $p=.101$ ,  $\eta_p^2= .025$ ).

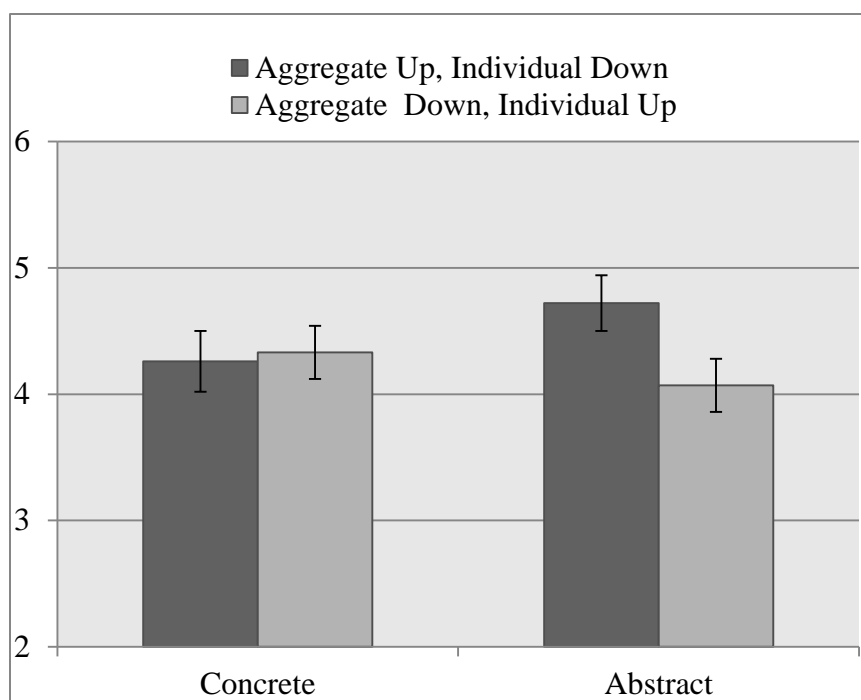


Figure 5. Study 1 mean satisfaction ratings by comparison condition and construal mindset.

Although the predicted interaction was not significant ( $F(1, 105)= 1.753$ ,  $p=.19$ ,  $\eta_p^2=.016$ ), there was an *a priori* directional prediction based on prior research.

Accordingly, statistical contrasts were conducted between the relevant means. In the



concrete mindset condition, consistent with a relative local dominance effect, satisfaction ratings did not differ between the aggregate downward/individual upward and the aggregate upward/individual downward comparison conditions (n.s.). However, in the abstract mindset condition, participants with upward aggregate/ downward individual comparison information were significantly less satisfied than participants with downward aggregate/ upward individual comparison information ( $p=.034$ ,  $d= .59$ ). Thus, as in Pilot Studies 1 and 2, a global dominance effect emerged for participants in an abstract mindset; relative standing with an aggregate better predicted satisfaction than relative standing with a co-participant.

### Secondary Dependent Measures

#### Performance

Performance ratings were subjected to a construal x comparison analysis of variance. A significant main effect of comparison condition emerged ( $F(1, 105)= 6.79$ ,  $p= .011$ ,  $\eta_p^2= .061$ ) such that participants who had downward aggregate and upward individual comparison information ( $M= 4.53$ ,  $SD= .77$ ) gave more favorable performance ratings than those who had upward aggregate and downward individual comparison information ( $M= 4.08$ ,  $SD= 1.03$ ). In other words, performances were rated as better if participants' were told they were better (versus worse) than average. However, there was no effect of construal condition or a construal x comparison condition interaction ( $F's < 1$ ). Statistical contrasts were conducted to test *a priori* hypotheses. In the abstract mindset condition, as predicted, participants who had aggregate downward/ individual upward comparison information rated their performance as better than those who had aggregate upward/ individual downward targets ( $p= .053$ ,  $d= .60$ ), demonstrating a global dominance effect. In the concrete mindset condition, no differences were predicted between comparison conditions, yet participants who had aggregate downward/ individual upward comparisons felt marginally better about their performance than those

who hate aggregate upward and individual downward comparison information ( $p = .086$ ,  $d = .41$ ).

### Social Perceptiveness

A significant construal  $\times$  comparison interaction was revealed for participants' self-rated social perceptiveness,  $F(1, 105) = 4.25$ ,  $p = .042$ ,  $\eta_p^2 = .039$ , see Figure 6.

Pairwise comparisons reveal that for participants in a concrete mindset, ratings of social perceptiveness did not differ by comparison condition (n.s.), consistent with previous findings. However, for participants in an abstract mindset, social perceptiveness ratings were higher for participants with upward aggregate (and downward individual) comparison information than downward aggregate (and upward individual) comparison information ( $p = .037$ ,  $d = .63$ ). While seemingly a global dominance effect, these differences are in the opposite direction of the predicted patterns.

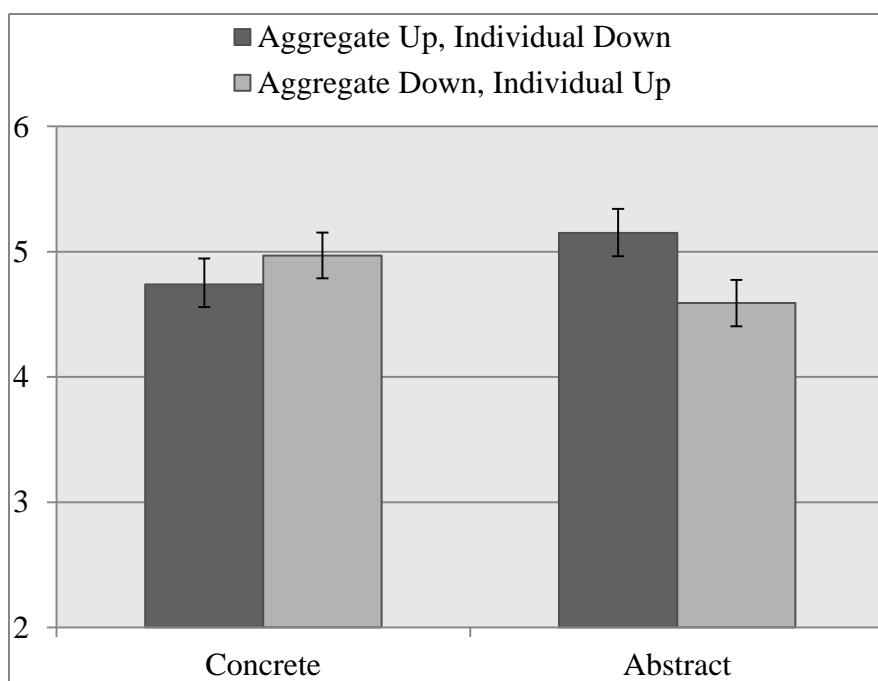


Figure 6. Study 1 mean ratings of social perceptiveness by comparison condition and construal mindset.

### Supplementary Analyses

Because the results did not all follow the predicted patterns, supplementary analyses were conducted. Rather than including the construal manipulation as a fixed factor, participants' construal index (as determined by the blind coders) was included as a covariate when testing the effects of comparison condition on self-evaluations. Despite the fact that there were large differences in the index between those in the concrete and abstract mindset, there was no evidence that construal index influenced self-evaluations.

### Demographics

Supplementary analyses were also conducted to evaluate whether demographic factors might have played a role. To test the influence of demographic variables on participants' satisfaction, performance, and social perceptiveness ratings, variables were included in the design. There was no effect of gender, ethnicity, or age of participants on their performance or social perceptiveness ratings. However, there was an effect of gender on participants' satisfaction ratings; a marginal gender x condition interaction emerged;  $F(1, 100) = 40.03, p = .10, \eta_p^2 = .976$  (see Figure 7. Males ( $N=36$ ) were more satisfied when they performed above average ( $M=4.82, SD= 1.01$ ) than when they were below average ( $M= 3.64, SD=1.50; p = .004, d = .89$ ); whereas females' ( $N=72$ ) satisfaction ratings did not differ by comparison condition (n.s.).

To further explore the effects of gender, the *a priori* hypotheses were tested for male and female participants separately. For males in an abstract mindset, receiving downward aggregate (and upward individual) comparison information ( $M=5.09, SD = .94$ ) led to greater satisfaction than receiving upward aggregate (and downward individual) comparison information ( $M= 3.56, SD= 1.51; p = .009, d = 1.52$ ), consistent with the prediction that an abstract mindset leads to a global dominance effect. However, for males in a concrete mindset, satisfaction did not differ between comparison

conditions (n.s.) which is consistent with a local dominance effect. For female participants, there were no differences between comparison conditions whether they were in an abstract or concrete mindset condition (n.s.). Thus, it appears that the effects of construal mindset and comparison condition on participants' satisfaction were specific to male participants; however, there were not enough participants of either gender (i.e., for males, there were less than ten participants per cell) to be certain.

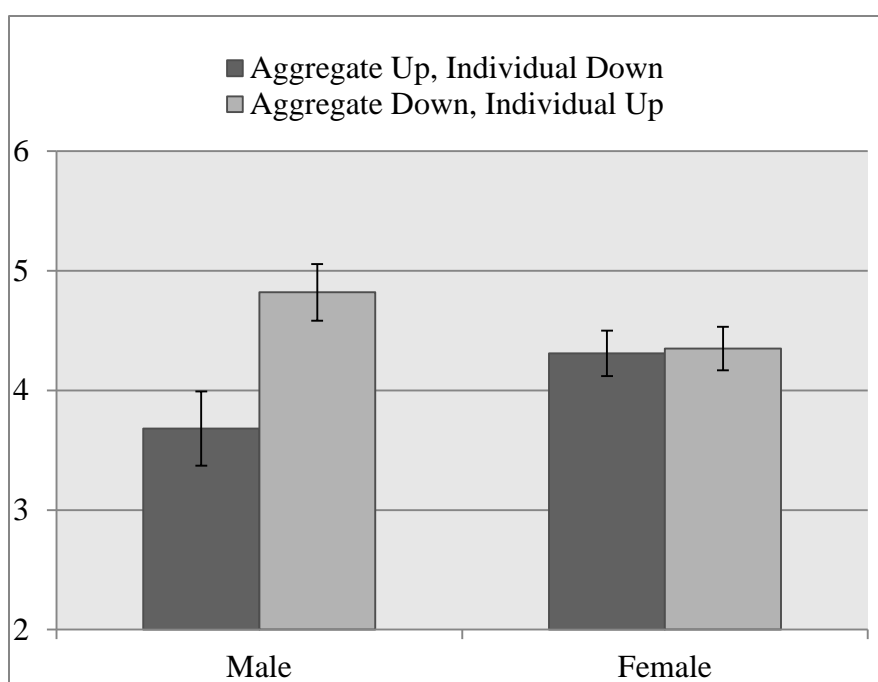


Figure 7. Study 1 mean satisfaction ratings by comparison condition and participant gender.

## Discussion

While the pattern of effects across the three dependent measures varied, there is evidence that both the comparison condition and the construal condition had effects on self-evaluations. Ratings of satisfaction with performance on the lie detection task followed a pattern consistent with predictions. Participants in an abstract mindset

demonstrated a global dominance effect; self-evaluations depended on whether or not participants were above or below average. However, for participants in a concrete mindset, comparison information did not appear to affect self-evaluations. Despite finding the predicted *pattern* of results, the construal x comparison condition interaction was not significant for satisfaction. This may be because the study was under-powered; according to analyses conducted using the G\*Power 3 software (Faul, Erdfelder, Lang, & Buchner, 2007), to achieve power of .8, a sample size of 199 would be required. With more participants, an interaction might have emerged; while as it stands, the overall pattern was consistent with hypothesis and statistically significant with a focused comparison.

Notably, supplementary analyses revealed that the evident pattern of results existed only for male participants, not for female. As mentioned above, there were not enough participants of either gender to make any firm conclusions; yet, based on the existing data, it would appear that males are more likely to demonstrate global dominance effects. For females, there was no evidence of global or local dominance effects, though the fact that their satisfaction did not differ by comparison condition might be seen as consistent with a local dominance effect. In other words, if being above average did not lead them to feel more satisfied, perhaps it is because of the individual co-participant who performed better than they did. There is not any evidence in the local dominance literature that females are more susceptible to the influence of local or individual targets, but this should be explored further as a possibility.

For ratings of performance, there was no effect of construal level; yet, participants' responses followed a logical pattern: participants rated their performance better when they performed above average than below average. For participants in an abstract mindset, this global dominance effect was predicted. However, for participants in a concrete mindset, it was predicted that there would be no differences between

comparison conditions, or that any differences would appear in the opposite direction. While the effect is smaller for participants in a concrete mindset (i.e., only marginally significant), performing above average still led to more favorable ratings than performing below average. Thus, there was no evidence of a local dominance effect for performance ratings.

Both construal level and comparison condition had an influence on self-rated social perceptiveness; however, these effects were in the opposite direction of the predictions. Participants with an abstract mindset felt they had greater social perceptiveness abilities if they performed below average on the lie detection task, rather than above average. This suggests either that participants in the abstract mindset are demonstrating a strong local dominance effect and contrasting away from the individual comparison targets (which, recall, were always in the opposite direction from the average), or that participants were assimilating towards the average comparison targets and still demonstrating a global dominance effect.

Responses to the satisfaction and performance dependent measures suggested contrast away from comparison targets; these evaluations were context-specific and perhaps more amenable to contrast effects. Social perceptiveness, on the other hand, was presented to participants as much more diffuse trait that subsumed lie-detection; thus, it is plausible that on a more “global” dimension, participants would be more inclined to assimilate, as there is evidence (Forster, 2009) that abstract mindsets do allow for assimilation in self-judgments. Other research has demonstrated that the more ambiguous the trait, the more favorable (and less sensitive to comparison information) self-evaluations become (Alicke et al., 1997; Dunning et al., 1989). In fact, Buckingham and Alicke (2002) demonstrated that participants who performed below average were able to maintain positive self-evaluations while context and performance-specific self-

evaluations were lower, which is consistent with the pattern of results across these three dependent measures.

## CHAPTER 4

### ALTERNATIVE CONSTRUAL LEVEL MANIPULATIONS AND THE RELATIVE INFLUENCE OF INDIVIDUAL COMPARISON INFORMATION

#### **Study 2**

The primary goal of Study 2 was to assess the influence of abstract versus concrete mindsets on a *relative* local dominance effect. While both pilot studies and Study 1 demonstrated a global dominance effect for participants in an abstract mindset, results in a concrete mindset were less clear. In both Pilot Study 1 and Study 1, satisfaction ratings of participants in a concrete mindset did not differ depending on comparison condition (i.e., aggregate upward and individual downward, or aggregate downward and individual upward comparisons). Since aggregate comparison information should be more diagnostic of performance than individual comparison information, logically, those with aggregate downward comparison information should have more favorable self-evaluations than those with aggregate upward comparison information. If an individual comparison target disproportionately influenced self-evaluations, it might be manifested by simply wiping away the effects of the aggregate comparisons. The only way to determine how much influence an individual comparison target has is to compare responses to both aggregate and individual target feedback to aggregate-only feedback. If these two cells yielded different results, it would demonstrate a relative local dominance effect (i.e., individual targets would change the use of aggregate targets); if they yielded similar results, it would demonstrate a global dominance effect (i.e., aggregates would matter more than individuals)

Thus, in Study 2, a set of conditions were included where participants only received comparison information from an aggregate. Self-evaluations from participants in these conditions were compared to those who had both aggregate and individual comparison information to determine the relative impact of individual comparison targets.



A secondary aim of Study 2 was to further assess the generalizability of the established effects by using a different manipulation of construal level. Instead of completing the how versus why task used in previous studies, participants in Study 2 completed a task in which they were asked to generate categories or exemplars associated with a list of target words (task adapted from Fujita et al., 2006). Categories are associated with higher, more abstract levels of construal, whereas exemplars are associated with more specific and concrete construal levels (e.g., Fujita et al., 2006; McCrea et al., 2011). Adaptations of this task have been shown to successfully manipulate construal level and have an influence on numerous judgments that typically demonstrate effects of construal level such as attitude consistency (Ledgerwood et al., 2010) and self-control (Fujita et al., 2006). However, effects of the category/exemplar task have not been tested on self-judgments after receiving social comparison information.

As in Study 1, the primary dependent measure was participants' self-rated satisfaction, but ratings of performance and ability were also included; in other words, the primary measure is an affective response, whereas the secondary measures were cognitive appraisals or diffuse trait ratings. Again, while there are not any expected differences in the patterns of results across these dependent measures, they will each be considered separate measures because of their qualitative differences.

### Predictions

Across all dependent measures, for participants in an abstract mindset, a global dominance effect was predicted; in other words, regardless of the presence (and direction of) or absence of comparison information from an individual, participants who learned they performed above average should have more favorable self-evaluations than those that are below average. However, for participants in the concrete mindset condition, an interaction was predicted that would be indicative of a relative local dominance effect. More specifically, participants who were given feedback that they performed better

(worse) than the aggregate would feel less (more) positively about themselves if they also had performed worse (better) than their co-participant. In other words, the inclusion of individual comparison information in the opposite direction of the aggregate comparison target would change the interpretation of the aggregate target; individual comparison information would be disproportionately weighted *relatively* to aggregate comparison information when forming self-evaluations.

## Method

### Participants and Design

Two hundred forty eight participants were recruited to participants in a study about “knowledge and creativity” via Amazon’s MTurk in exchange for a nominal fee. Data from 27 participants were excluded for a variety of reasons (e.g., failing to complete tasks or recognizing feedback to be bogus) leaving a sample of 221 participants (56.6% female, 72% age 25 or older, and 49.8% with at least an associate’s degree). Participants were randomly assigned to one of eight conditions in a 2 (construal: category vs. exemplar) x 2 (aggregate comparison: upward, downward) x 2 (individual comparison: absent, present) design.

### Materials and Procedure

Participants read that they would be completing a trivia task, as well as a measure of verbal creativity to assess “individual differences in knowledge and creativity”. The trivia task consisted of 25 difficult questions with two answer options, and items were selected from the tasks in both Pilot Studies 1 and 2; see Appendices A and B.

Upon completing the trivia task, participants completed a “verbal creativity” task, which was actually a category/exemplar construal manipulation task (adapted from Fujita, et al., 2006). Participants in the abstract (i.e., *category*) construal condition were told that they would be given a list of exemplars and that their task was to think of a category to which the exemplar belonged. For example, if given the word “dog”, participants could respond with categories such as “house pets” or “mammals”.

Participants in the concrete (i.e., exemplar) construal condition were told that they would be given a list of categories and that their task was to think of an exemplar of each category. For example, if given the word “dog”, participants could respond with exemplars such as “beagle” or “poodle”. Participants in both conditions were then given the same list of 25 words such as “soda”, “restaurant”, or “soap opera” (see Appendix C).

After completing the category/exemplar task to induce construal level, participants received bogus feedback about their performance on the trivia task. All participants found out that they had answered 63% of the questions correctly. They also found out the average score (either 49% or 77%) and in certain conditions, they also found out the score of the last participant to (purportedly) complete the task (either 77% or 49%). If both types (i.e., aggregate and individual) of comparison information were present, they were always in opposite directions and sandwiched around the participants’ own score.

#### Dependent Measures

Participants rated their satisfaction, performance, and general trivia knowledge on seven point scales (1= *very dissatisfied/ very poor*, 7= *very satisfied/very good*). Participants also indicated how honest they were when completing the trivia task (1= *completely dishonest*, 7= *completely honest*), and were asked to recall their own scores as well as the average score and their co-participants’ score (if applicable). Finally, participants responded to a suspicion probe about the true nature of the study before being debriefed and compensated for their time.

#### Results

Participants reported that they were almost completely honest on the trivia task ( $M= 6.98$ ,  $SD= .13$ ), and honesty ratings did not differ by condition (n.s.). Responses to the three dependent measures were correlated ( $r$ 's ranging from small to large); see Table 3 for correlation values. See Table 4 for means and standard deviations of all dependent measures.

Table 3. Study 2 correlations of dependent measures.

	(1)	(2)	(3)
Satisfaction	1		
Performance	.67***	1	
Trivia Knowledge	.36***	.21**	1

Note: \*\* indicates  $p < .01$ , \*\*\* indicates  $p < .001$

### Manipulation Check

To assess whether participants followed the instructions of the construal manipulation, two independent coders (blind to condition) rated the responses to the category/exemplar task as either being an example (-1) of the target word, or a category (+1) that the target word belonged to. Responses that could be either examples or categories were coded as a 0. For each participant, one construal index was created by averaging across responses, and across coders (whose ratings were highly correlated,  $r = .989$ ). As expected, participants in the abstract (category) condition gave more category-related responses ( $M = .82$ ,  $SD = .22$ ) and participants in the concrete (exemplar) condition gave more exemplar-related responses. ( $M = -.79$ ,  $SD = .27$ ). The responses were significantly different from one another;  $t(218) = 47.39$ ,  $p < .001$ ,  $d = 6.54$ , and both conditions were significantly different from zero ( $p$ 's  $< .001$ ).

Table 4. Study 2 mean self-evaluations by construal and comparison conditions.

	Abstract Mindset				Concrete Mindset			
	Aggregate Upward		Aggregate Downward		Aggregate Upward		Aggregate Downward	
	Individual Absent	Individual Upward	Individual Absent	Individual Downward	Individual Absent	Individual Downward	Individual Absent	Individual Downward
Satisfaction	3.32 (1.31)	2.55 (1.18)	3.96 (1.49)	3.79 (1.58)	3.43 (1.63)	3.20 (1.53)	4.10 (1.61)	3.89 (1.51)
Performance	3.50 (1.14)	2.97 (1.15)	4.36 (1.35)	4.26 (1.37)	3.24 (1.34)	3.34 (1.19)	4.59 (1.05)	4.31 (1.16)
Trivia Knowledge	4.29 (1.08)	3.93 (1.44)	4.52 (1.23)	4.68 (1.00)	4.52 (1.47)	4.23 (1.24)	4.66 (1.42)	4.37 (1.19)

Note: Standard deviations appear in parentheses.

### Satisfaction

Participants' satisfaction ratings were subjected to a construal x aggregate comparison x individual comparison ANOVA. See Figures 8 and 9. A main effect of aggregate comparison emerged such that participants who received aggregate downward comparison information ( $M= 3.94, SD= 1.53$ ) were more satisfied with their performance than participants who had aggregate upward comparison information ( $M= 3.11, SD= 1.44$ ),  $F(1, 213)= 15.84, p< .001, \eta_p^2= .069$ , whether or not they also had comparison information from an individual target. There was also a marginal effect of individual comparison such that participants who had individual comparison information available ( $M= 3.72, SD= 1.52$ ) felt slightly more satisfied than those without information from an individual, regardless of the direction of the comparison information ( $M= 3.34, SD= 1.53$ ),  $F(1, 213)= 2.91, p=.09, \eta_p^2= .013$ . There were no significant interactions or effects of construal level condition ( $F$ 's $<1$ ). However, specific contrasts were conducted based on *a priori* hypotheses.

### Abstract Mindset

For participants in an abstract mindset, as predicted, there was a main effect of aggregate comparison condition ( $F(1, 97)= 11.44, p=.001, \eta_p^2= .105$ ) such that participants who had downward aggregate comparison information ( $M=3.89, SD= 1.51$ ) were more satisfied than those who had upward aggregate comparison information ( $M= 2.93, SD= 1.29$ ), regardless of the presence or absence of individual comparison information. There was also an unexpected marginal main effect of individual comparison ( $F(1, 97)= 2.87, p=.093, \eta_p^2= .029$ ) such that participants were more satisfied when they had an individual comparison target ( $M= 3.62, SD= 1.42$ ) than when they did not ( $M= 3.04, SD= 1.47$ ). Pairwise comparisons revealed that this was true for participants in the aggregate upward (but not downward) comparison condition; participants were more satisfied when they had downward individual comparison information ( $p= .037, d= .62$ ), demonstrating a relative local dominance effect.

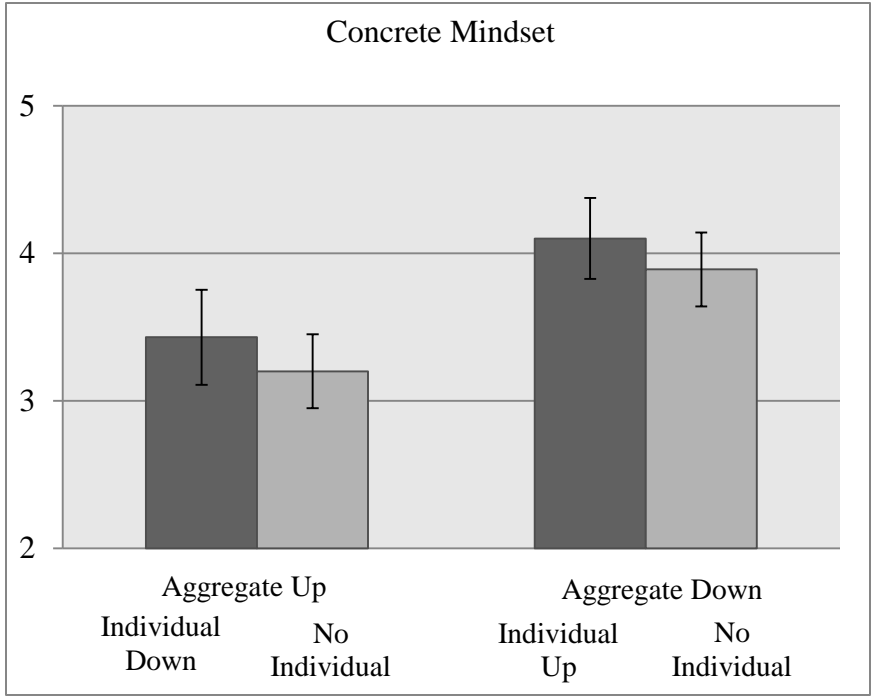


Figure 9. Study 2 mean satisfaction ratings by aggregate comparison and individual comparison; concrete mindset.

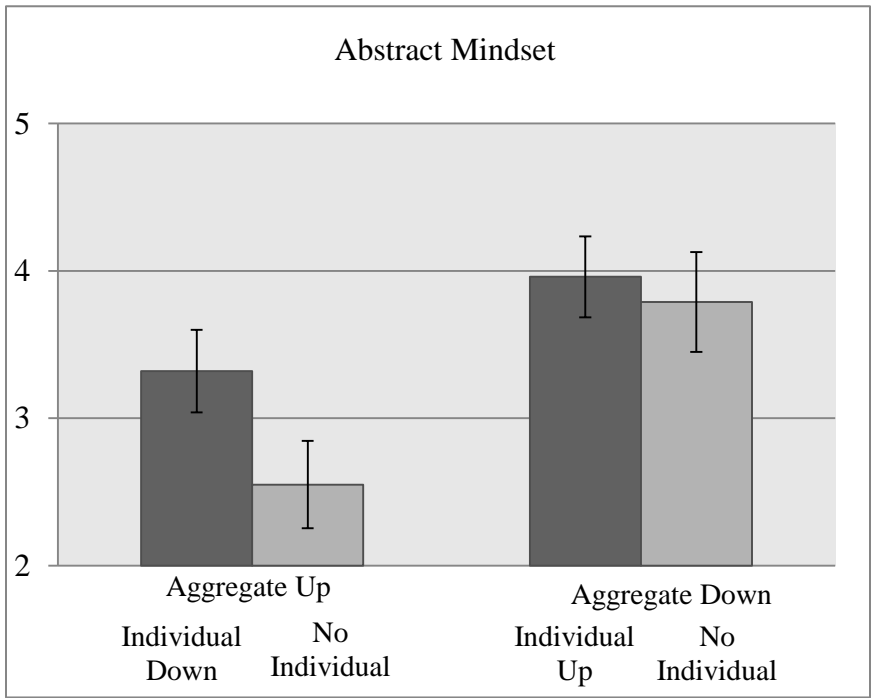


Figure 8. Study 2 mean satisfaction ratings by aggregate comparison and individual comparison; abstract mindset.

### Concrete Mindset

For participants in a concrete mindset, there was a main effect of aggregate comparison condition ( $F(1, 116) = 5.45, p = .021, \eta_p^2 = .045$ ), such that participants who had a downward aggregate comparison target ( $M = 3.98, SD = 1.55$ ) were more satisfied than those who had an upward aggregate comparison target ( $M = 3.29, SD = 1.56$ ). There was no influence of individual comparison condition ( $F < 1$ ), demonstrating no evidence for a relative local dominance effect, contrary to prediction.

### Secondary Dependent Measures

#### Performance

A main effect of aggregate comparison condition also emerged on participants' performance evaluations,  $F(1, 213) = 45.64, p < .001, \eta_p^2 = .176$ , such that participants who were had downward aggregate comparison information ( $M = 4.39, SD = 1.21$ ) rated their performance as better than those who had upward aggregate comparison information ( $M = 3.27, SD = 1.18$ ). Planned contrasts based on a priori hypotheses revealed that for participants in an abstract mindset, the predicted global dominance effect emerged: participants who had downward aggregate comparisons ( $M = 4.32, SD = 1.34$ ) provided more favorable performance ratings than those that had upward aggregate comparisons ( $M = 3.23, SD = 1.17; F(1, 97) = 18.56, p < .001, \eta_p^2 = .161$ ), regardless of the presence or absence of individual comparison information. Participants in the concrete mindset condition also provided better ratings if they had downward information ( $M = 4.44, SD = 1.11$ ) versus upward aggregate comparison information ( $M = 3.30, SD = 1.24; F(1, 116) = 27.97, p < .001, \eta_p^2 = .194$ ). The presence or absence of individual comparison information did not appear to have an effect on performance ratings; in other words, there was no evidence of the predicted relative local dominance effect.

#### Trivia Knowledge

Similarly, participants who had downward aggregate comparison information ( $M = 4.54, SD = 1.23$ ) rated their general trivia knowledge as marginally better than



participants who had upward aggregate comparison information ( $M= 4.22$ ,  $SD= 1.30$ ),  $F(1, 213)= 3.26$ ,  $p=.072$ ,  $\eta_p^2= .015$ , regardless of individual comparison target status. Post hoc analyses revealed that there was no effect of individual comparison condition for either mindset condition ( $F$ 's $<1$ ), demonstrating global dominance effects across all conditions.

#### Average Comparison Recall

Because in Pilot Study 1 participants in an abstract mindset had greater accuracy in recalling the aggregate comparison information, recall accuracy was assessed to determine if the category/exemplar construal manipulation had any effect. Accurate values of (either 49 or 77 depending on condition) were re-coded as 1, and any other value was coded as a 0. The frequency of accurate aggregate-recall responses were subjected to a chi-squared analysis. No differences in accuracy emerged between the abstract (25% were accurate) versus concrete (31%) conditions,  $\chi^2(1, N=221)= 1.29$ ,  $p=.257$ .

#### Supplementary Analyses

Because there was no evidence that the construal manipulation had an impact on any of the dependent measures or on participants' recall accuracy, supplemental analyses were conducted to determine if construal level played any role in forming self-evaluations. Instead of using construal manipulation as an independent variable, a 2 (aggregate comparison: upward, downward) x 2 (individual comparison: present, absent) analysis of variance was conducted including construal index (as determined by coders' ratings) as a covariate for all dependent measures. Including construal-index as a covariate did not yield any significant findings, nor did it change the pattern of the established results.

Because the patterns of results did not follow the predicted patterns, supplementary analyses were conducted to evaluate whether demographic factors might have played a role. To test the influence of demographic variables on participants'

satisfaction and performance ratings, variables were included in the design. Education level and age had no effects on any dependent measures ( $F$ 's < 1). However, when gender was included in the analyses for performance ratings, a significant aggregate condition  $\times$  construal condition  $\times$  gender interaction emerged,  $F(1, 205) = 14.78$ ,  $p < .001$ ,  $\eta_p^2 = .067$ . Simple effects were analyzed.

#### Male Participants

For male participants ( $N = 95$ ), a main effect of aggregate comparison emerged,  $F(1, 92) = 20.50$ ,  $p < .001$ ,  $\eta_p^2 = .911$ , such that participants made higher performance ratings if they had downward ( $M = 4.47$ ,  $SD = 1.36$ ) versus upward ( $M = 3.24$ ,  $SD = 1.18$ ) aggregate comparison information. A main effect of construal condition also emerged,  $F(1, 92) = 4.57$ ,  $p = .035$ ,  $\eta_p^2 = .047$ , such that participants in the concrete mindset condition ( $M = 4.04$ ,  $SD = 1.37$ ) rated their performance better than those in the abstract mindset condition ( $M = 3.52$ ,  $SD = 1.40$ ). The two main effects were qualified by an aggregate comparison  $\times$  construal interaction,  $F(1, 92) = 8.80$ ,  $p = .004$ ,  $\eta_p^2 = .087$ . See Figure 10.

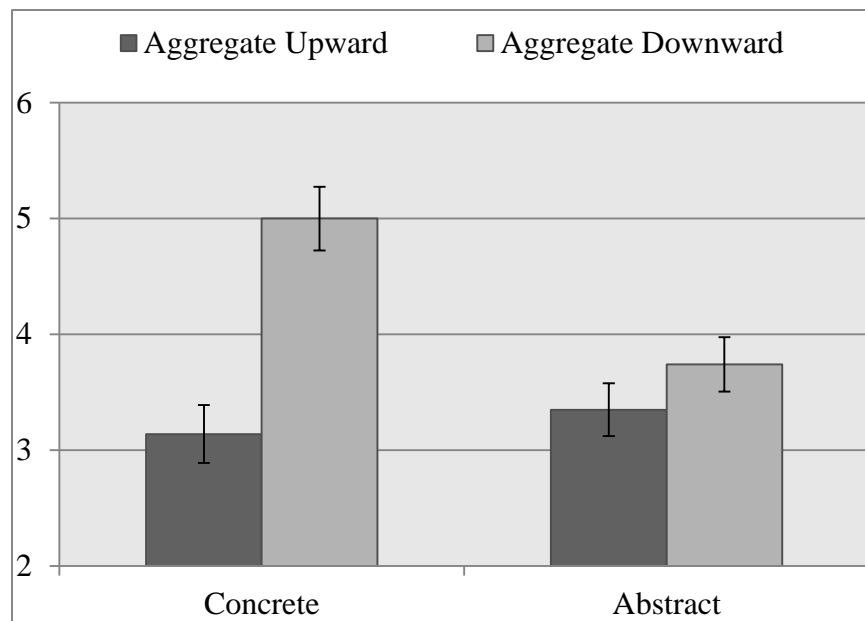


Figure 10. Study 2 mean performance ratings by aggregate comparison and construal mindset; male participants

For male participants in a concrete mindset, a global dominance effect emerged such that having upward aggregate comparison targets ( $M= 3.14$ ,  $SD= 1.18$ ) led to worse ratings than having downward aggregate comparison targets ( $M= 5.00$ ,  $SD= .89$ ;  $p<.001$ ,  $d=1.78$ ). For male participants in an abstract mindset, there were no differences between the aggregate comparison conditions. In other words, males participants demonstrated a global dominance effect in a concrete mindset, but not in an abstract mindset; the opposite of what was predicted.

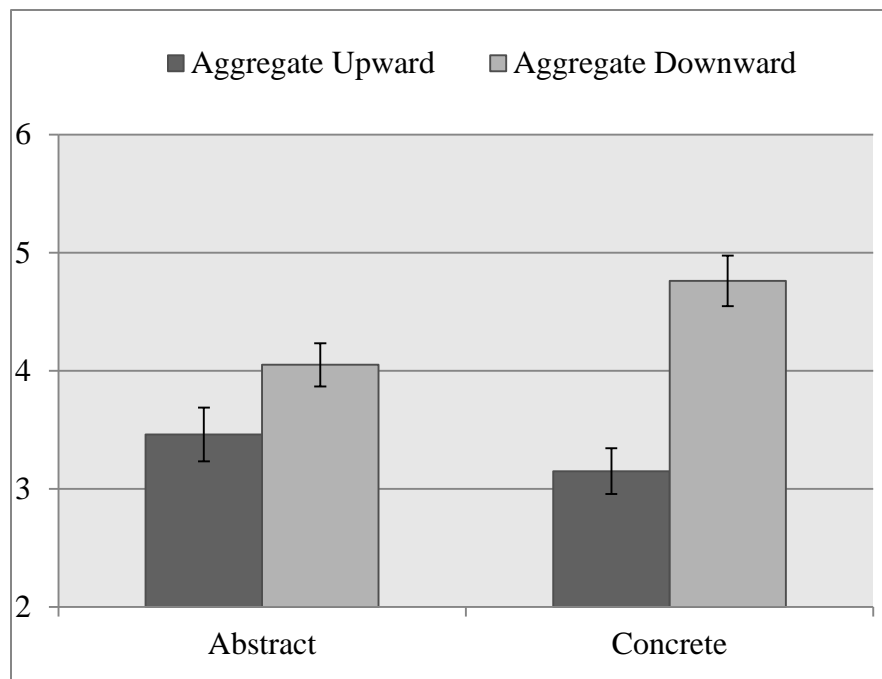


Figure 11. Study 1 mean performance ratings by aggregate comparison and construal mindset; female participants.

### Female Participants

For female participants ( $N= 125$ ), a main effect of aggregate comparison condition emerged,  $F(1, 121)= 28.65$ ,  $p<.001$ ,  $\eta_p^2= .191$ , such that receiving downward aggregate comparison information ( $M= 4.33$ ,  $SD= 1.09$ ) resulted in better ratings than

receiving upward aggregate comparison information ( $M= 3.29, SD= 1.22$ ). A significant aggregate comparison x construal interaction also emerged,  $F(1, 121)= 6.21, p=.014, \eta_p^2=.049$ . See Figure 11. Pairwise comparisons revealed that for participants with downward aggregate comparison information, participants in an abstract mindset ( $M=4.76, SD= .97$ ) rated their performance as better than those in a concrete mindset ( $M= 4.05, SD= 1.09; p=.017, d= .69$ ); for female participants with upward aggregate comparison information, there were no differences in performance ratings between construal conditions (n.s.).

Though gender did influence performance ratings, neither males nor females responses were consistent with predictions, and these effects do not seem to provide insight about the overall patterns of effects.

## Discussion

### Construal Level

Across ratings of satisfaction and general trivia knowledge, there was no evidence that the construal manipulation had an impact. For performance ratings, the construal manipulations demonstrated differential effects for male and female participants; for males, more favorable performance ratings were provided by participants in a concrete mindset, and for females more favorable ratings were provided when in an abstract mindset. Though some research has indicated that abstraction allows for more positive affect (e.g., Williams & Bargh, 2008), main effects of construal level were not predicted in this work. The gender differences also cannot be explained by any theoretical perspective. Because this study did not include a manipulation check for construal level, it is difficult to determine whether the manipulation was ineffective or if it truly had different affects for males versus females.

Though other researchers have used the category exemplar task successfully to manipulate construal level (e.g., Ledgerwood et al., 2010; Fujita et al., 2006), it has not been used in studies that involve self-evaluations or comparison information. While construal level researchers suggest that most manipulations (and various outcomes) of

construal level can be used interchangeably, this study indicates that not all manipulations of abstract versus concrete mindsets work in the same way.

#### Relative Local Dominance?

It was predicted that in concrete mindsets that the inclusion of an individual comparison target would change self-evaluations that were just based on average comparison target. However, across all three dependent measures, participants in a concrete mindset who were above average gave more favorable self-ratings than those who were below average. In other words, there was no evidence of a (relative) local dominance effect for participants in a concrete mindset; instead, self-evaluations consistently were contrasted from aggregate comparison targets.

For participants in an abstract mindset, no evidence of relative local dominance was expected in self-evaluations. However, for participants with upward aggregate comparison information, participants felt more satisfied if they also had a downward individual comparison target, demonstrating a relative local dominance effect. While this difference was not predicted from a construal level perspective, it can be explained by the self enhancement literature. People are motivated to maintain positive self-concepts, and much research has demonstrated the use of downward social comparison information as a means to repair or improve self-image (e.g., Wills, 1991; Ahrens, 1997). Research on “sandwich comparisons” (i.e., having availability of both upward and downward comparison targets); suggests that people utilize mixed comparison information strategically to optimize feelings of self-worth (Bruchmann & Suls, unpublished manuscript). Accordingly, if performing below average can be seen as threatening, the downward comparison targets might have been used as a way to boost self-image.

In sum, the results from Study 2 suggest that the relationship between construal level and the use of global versus local comparison targets may not be robust. The only consistent finding was that across conditions, participants responded differentially to performing better versus worse than average.

CHAPTER 5  
COMPARISONS WITH AGGREGATE OR INDIVIDUAL, TEMPORALLY  
DISTANT OR PROXIMAL TARGETS

**Study 3**

As demonstrated in Pilot Studies 1-2 and Study 1, abstract (versus concrete) construal mindsets can change the way people interpret or use individual versus aggregate comparison information. The aim of Study 3 is to extend this research by manipulating the psychological distance (specifically temporal distance) of comparison targets instead of manipulating construal level mindset. Much research has demonstrated that there are bi-directional associations of construal level and psychological distance (e.g., Bar-Anan, Liberman, & Trope, 2006; Fujita et al., 2006; Henderson, et al., 2011). In other words, greater psychological distance is associated with more abstraction, and more abstract thought is associated with representations of greater psychological distance.

Psychological distance and construal level manipulations also have been shown to have similar influences on other judgments and decisions. For example, both increased temporal distance and abstract mindsets have been linked to consistency versus flexibility in attitudes (Ledgerwood et al., 2010). Additionally, the same cue can activate both abstraction and distance; for example, recent research (Steidle, Werth, & Hanke, 2011) demonstrated that priming or manipulating darkness activates both abstract processing, and greater perceived psychological distances from targets.

Because construal level and psychological distance manipulations typically produce similar effects on judgments and decisions, it is predicted that manipulating psychological distance will have similar effects on responses to comparison information as manipulating construal level. To be more specific, it is predicted that increased temporal distance will lead participants to demonstrate a global dominance effect and rely more on aggregate comparison information than individual comparison information when

making self-evaluations. Conversely, it is predicted that comparing with psychologically proximal participants will lead to more reliance on individual comparison targets.

Manipulating the distance of comparison targets may also be a more ecologically valid way to test the influence of psychological distance or construal on the use of comparison information. People might rarely ponder why or how to do something before getting comparison information, but social comparison is a pervasive phenomenon and likely to be elicited by proximal or distal targets.

A secondary goal of Study 3 was to measure processing level to understand the mechanism through which construal level or psychological distance influences the impact of comparison information from individual or aggregate targets. The Kimchi-Palmer-Figure-Task (Kimchi & Palmer, 1982) was used to measure participants' perceptual processing levels. Previous work has demonstrated that both manipulations of construal level as well as psychological distance have an influence on responses to this figure task (e.g., Basso & Lowery, 2004); abstract construal levels or increased psychological distance lead to more global processing, and concrete construal levels and psychological proximity lead to more local processing. Thus, it was predicted that temporally distant comparison targets should prompt more global processing in Study 3. Further, processing level should mediate the relationship between psychological distance and differential uses of comparison information.

Finally, in Study 3, measures of interest not only included self-evaluations, but also behavioral intention questions about future performance on similar or related tasks. While predictions for behavioral intention questions are not necessarily different from the self-evaluations, it is possible that behavioral intention measures will elicit responses in the opposite direction. Responses indicating future performance can allow for self-esteem repair for those with threatening (i.e., upward) comparison information (Tesser, 1988). Thus, those who are told they are performing below average or worse than a co-participant might report better future performances.

## Method

### Participants and Design

MTurk workers (N= 195) participated in a study about “trivia and the self” in exchange for a nominal fee. Data from 31 participants were excluded from the analyses for identifying the feedback as fabricated or reporting that they were dishonest on the trivia task. This left a sample of 164 participants (48.2% female, 79.9% white, average age 35 years). Participants were randomly assigned to one of four conditions in a 2 (temporal distance: near, far) x comparison feedback (aggregate upward/ individual downward, aggregate downward/individual upward) factorial design.

### Procedure and Materials

Participants completed a 25-item trivia task with the same format as the other studies (See Appendix A-B for complete list of questions). After completing the task, participants read that they would be given feedback about their performance, as well as information about another participant and the average score. In the “near condition,” participants were told that the source of comparison information would be the “last participant” who ostensibly completed the study just a few minutes prior. In the “far condition,” participants were told that they would find out information from “the last time the study was run, just over a year ago, in 2011”.

All participants received a score of 63% correct on the trivia task, and were told that the co-participant’s (either recently or 2011) and the aggregate scores were 49% and 77% (or 77% and 49%, depending on condition). In the “near condition,” the comparison feedback was labeled “other information”, and in the “far condition,” the feedback was labeled “2011 Study information”.

After viewing the feedback, participants rated their satisfaction with their score, and their performance in general on seven point scales (1= *very dissatisfied/very poor*, 7= *very satisfied/ very good*). Participants were also asked what their score would be if they



took a similar task again (% out of 100), and how likely they would be to attend a trivia night with cash prizes (1= *not at all likely*, 7= *very likely*).

Next, participants completed the Kimchi-Palmer Figure Task (Kimchi & Palmer, 1982) to assess their level of processing (i.e., global or local). For each of 23 items (Refer to Figure 2 for an example), participants saw a target image that consisted of a “global” shape (in this case, a triangle) made up of smaller, “local” shapes (in this case, squares). Then, they were asked which of two other images more closely resembled the target image. One was always the same global shape (in this case, the triangle on the right), and the other image had the same smaller, local shape (in this case, the small squares making up the larger square on the left). If participants matched the shapes based on the global shape (i.e., the triangle on the right), this would indicate that they were processing more globally.

Participants then completed the three-item Cognitive Reflection Task (CRT; Frederick, 2005). This math based task assesses people’s ability to inhibit an automatic response and instead rely on a more deliberative response. For example, the first item reads “A bat and ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?” While the automatic and seemingly obvious response is \$.10, the correct response (which requires some deliberation) is \$.05. The CRT has functioned as a proxy for an intelligence measure (Oechssler, Roider, & Schmitz, 2009), as well as a measure of numeracy abilities (e.g., Obrecht, Chapman, & Gelman, 2007). Because an understanding of math is necessary for an understanding of comparison information—especially from an average or aggregate target—it is possible that individual differences in the CRT account for differences in responses to complex comparison information.

As a manipulation check of the temporal distance manipulation, participants were also asked to recall when their co-participants completed the study. Finally, participants were probed for suspicion with three open-ended questions about their beliefs about the

purpose of the study and potential relationships between tasks. Then, participants were full debriefed and given a payment code.

### Results

Participants reported being very honest on the trivia task ( $M= 3.87$  out of 4,  $SD=.61$ ), and honesty levels did not differ by condition (n.s.). Participants answered an average of 58.66% ( $SD=10.08$ ) of the trivia items correctly, which did not differ by condition (n.s.). Participants' responses to the manipulation check were scored as a 1 if accurate (i.e., "2011" or "last year" for the far condition and "recently" or "just before me" for the near condition) and 0 if inaccurate or participants did not know. In general, participants were very accurate ( $M=.73$ ,  $SD=.40$ ) and accuracy did not differ by condition (n.s.) No participants far (near) condition mis-remembered that participants had completed the study recently (a year ago). Participants' scores on the CRT did not differ by condition (n.s.;  $M= 1.53$ ,  $SD= 1.16$ ). Correlations between the four dependent measures were assessed; see Table 5. See Table 6 for means and standard deviations of all measures.

Table 5. Study 3 correlations of dependent measures.

	(1)	(2)	(3)	(4)
(1) Satisfaction	1			
(2) Performance	.703 <sup>***</sup>	1		
(3) Score Again	-.230 <sup>**</sup>	-.111	1	
(4) Trivia Night	-.152 <sup>*</sup>	-.026	.230 <sup>**</sup>	1

Note: \* indicates  $p<.05$ , \*\* indicates  $p<.01$ , \*\*\* indicates  $p<.001$

Table 6. Study 3 means and standard deviations.

Measures	Temporally Near		Temporally Far	
	Aggregate Up, Individual Down	Aggregate Down, Individual Up	Aggregate Up, Individual Down	Aggregate Down, Individual Up
Satisfaction	4.00 (1.37)	4.85 (1.20)	3.90 (1.19)	4.74 (1.14)
Performance	3.64 (1.30)	4.54 (1.10)	3.77 (1.20)	4.36 (1.18)
Task Again	68.9% (7.8%)	66.9% (8.0%)	70.1% (6.2%)	69.3% (7.4%)
Trivia Night Kimchi- Palmer	4.87 (1.63)	4.54 (1.65)	4.67 (1.34)	4.69 (1.85)
	17.07 (7.97)	17.24 (7.12)	16.71 (8.71)	16.79 (8.87)

Note: Standard deviations appear in parentheses

### Satisfaction

Participants' satisfaction ratings were subjected to a temporal distance x comparison condition ANOVA. See Figure 12. A main effect of comparison condition emerged,  $F(1, 160) = 19.50, p < .001, \eta_p^2 = .11$ , such that participants who had upward aggregate (and downward individual) comparison information were less satisfied ( $M = 3.95, SD = 1.28$ ) than participants who had downward aggregate (and upward individual) comparison information ( $M = 4.80, SD = 1.16$ ). No effects of temporal distance condition emerged ( $F < 1$ ). However, based on an *a priori* hypothesis, pairwise contrasts were conducted. As predicted, in the temporally far condition, participants who had downward aggregate comparison information were more satisfied than those had upward aggregate comparison information, regardless of the direction of individual comparison information ( $p = .003, d = .64$ ). In the near condition, no differences were predicted between comparison conditions. Contrary to prediction, the same pattern was exhibited for the proximal condition; performing above average led to more satisfaction ( $p = .002, d = .66$ ).

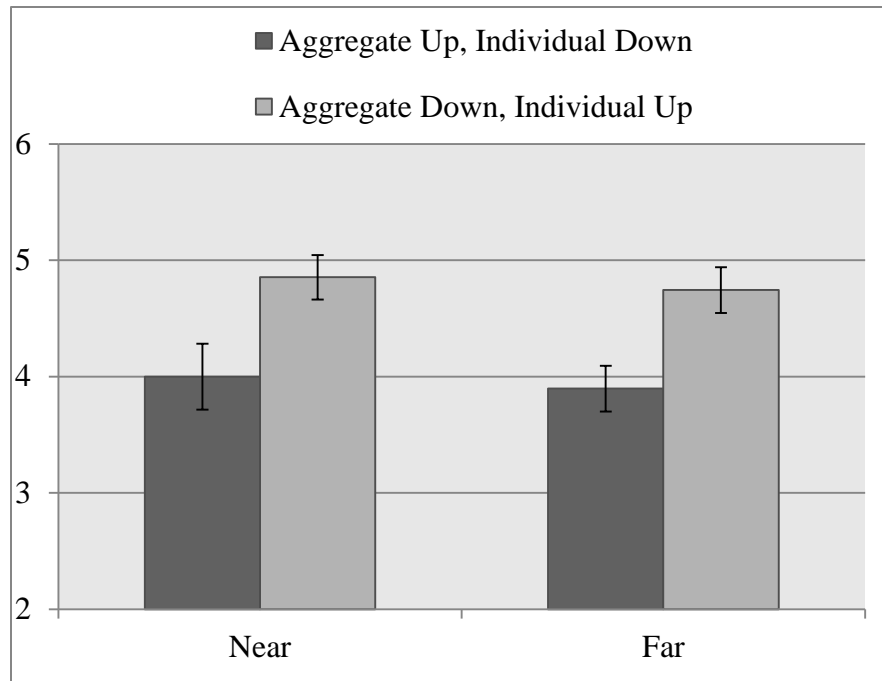


Figure 12. Study 3 mean satisfaction ratings by comparison and temporal distance conditions.

### Secondary Dependent Measures

#### Performance

There was also a main effect of comparison condition on participants' performance ratings,  $F(1, 160) = 15.58, p < .001, \eta_p^2 = .089$ . Again, participants who had upward aggregate comparison targets ( $M = 3.70, SD = 1.25$ ) rated their performance as worse than those who had downward aggregate comparison targets ( $M = 4.45, SD = 1.14$ ). There was no evidence that psychological distance affected performance ratings ( $F < 1$ ). Planned contrasts were conducted based on *a priori* predictions. Participants in the far condition rated their performance consistently with predictions; downward aggregate comparisons led to higher ratings than upward aggregate comparisons ( $p = .031, d = .50$ ). However, participants in the near condition also gave better performance evaluations if

they had downward aggregate comparison targets ( $p=.002$ ,  $d=.75$ ), which was inconsistent with local dominance predictions.

#### Behavioral Intentions

There were no significant effects of comparison condition or psychological distance on participants' estimates of how well they would do if they completed a similar task again ( $M= 68.78\%$  correct,  $SD= 7.45\%$ ) or on participants' intentions to attend a trivia night ( $M=4.70$ ,  $SD=1.62$ ).

#### Processing Level

For each of the 23 items in the Kimchi-Palmer-Figures-Task (Kimchi & Palmer, 1982), responses associated with the global shape of the target item were coded as one, and responses associated with the local shapes of the target item were coded as zero. Thus, higher scores indicate more global processing. As expected, there were no effects of comparison condition on processing level (n.s.). However, it was predicted that increased temporal distance should lead to more global processing; yet, a t-test revealed that there was no effect of temporal distance condition on responses to the figure task ( $M= 16.96$ ,  $SD=8.24$ ). Comparing figure task scores to 11.5 (the midpoint of the possible 23 point total) with a one-sample t-test indicated that participants in both the temporally near and far conditions were processing the shapes more globally ( $p's<.001$ ).

#### Supplementary Analyses

Because there was no conclusive evidence that the psychological distance manipulation had an impact on the use of comparison information or on processing level, supplementary analyses were conducted to assess the role of processing level on the use of comparison information. Two ANOVAs were conducted using participants' figure task total as a covariate. Again, there was no evidence that processing level influenced the impact of comparison information for either satisfaction or performance ratings ( $F's<1$ ).

### Cognitive Reflection Task

Because using aggregate comparison information correctly might require numeracy abilities, participants' CRT scores were also assessed. Two temporal distance x comparison condition x CRT score mixed ANOVAs were conducted. The inclusion of the CRT measure (measuring numeracy and intelligence) was unrelated to ratings of satisfaction or performance on the trivia task ( $F$ 's < 1).

### Demographic Variables

Supplementary analyses were also conducted to evaluate whether demographic factors might have played a role. To test the influence of demographic variables on participants' satisfaction and performance ratings, variables were included in the design.

There was a significant main effect of gender on participants' satisfaction,  $F(1, 156) = 4.50, p = .035, \eta^2 = .028$ , such that males ( $M = 4.18, SD = 1.25$ ) were less satisfied than females ( $M = 4.56, SD = 1.32$ ). This was qualified by a marginal aggregate comparison x gender interaction,  $F(1, 156) = 2.60, p = .109, \eta_p^2 = .016$ . See Figure 13.

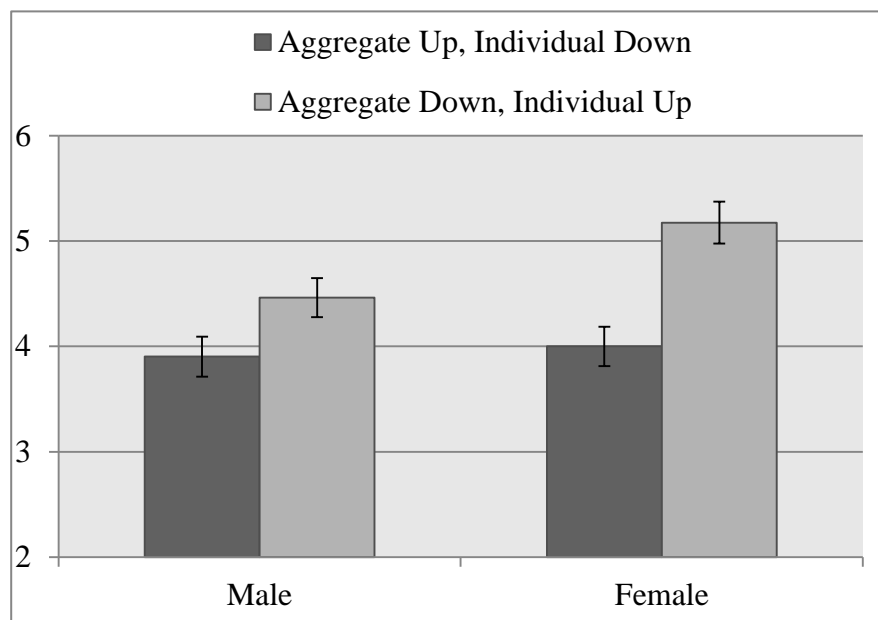


Figure 13. Study 3 mean satisfaction ratings by comparison condition and participant gender.

For both males and females, having downward aggregate comparison information led to greater satisfaction than having upward aggregate comparison information; however, these differences were smaller for males ( $p = .036$ ,  $d = .47$ ) than for females ( $p < .001$ ,  $d = 1.01$ ). Gender did not have an impact on participants' performance ratings, nor did it change how comparison information or temporal distance influence ratings. Neither race nor age had an impact on satisfaction or performance ratings.

There was a marginal temporal distance x comparison x education-level interaction,  $F(3, 147) = 2.28$ ,  $p = .082$ ,  $\eta_p^2 = .044$  on participants' ratings of satisfaction. Simple effects tests revealed that for participants with "some college" ( $N = 60$ ) there was a main effect of comparison condition,  $F(1, 56) = 5.27$ ,  $p = .025$ ,  $\eta_p^2 = .086$ , such that those with aggregate downward targets ( $M = 4.66$ ,  $SD = 1.23$ ) felt more satisfied than those with aggregate upward targets ( $M = 3.90$ ,  $SD = 1.35$ ). There was also a marginal main effect of temporal distance condition,  $F(1, 56) = 3.30$ ,  $p = .075$ ,  $\eta_p^2 = .056$ , such that those with recent (i.e., "near") targets ( $M = 4.61$ ,  $SD = 1.37$ ), were more satisfied than those with far targets ( $M = 3.97$ ,  $SD = 1.26$ ). These main effects were qualified by a temporal distance x comparison condition interaction,  $F(1, 56) = 4.51$ ,  $p = .038$ ,  $\eta_p^2 = .074$ ; see Figure 14. For participants in the near condition, those with upward aggregate and downward individual ( $M = 3.85$ ,  $SD = 1.41$ ) were less satisfied than those with downward aggregate and upward individual comparison information, ( $M = 5.27$ ,  $SD = .96$ ;  $p = .004$ ,  $d = 1.18$ ). For participants in the far condition, there were no differences between comparison conditions. These two findings are the opposite of the predicted patterns.

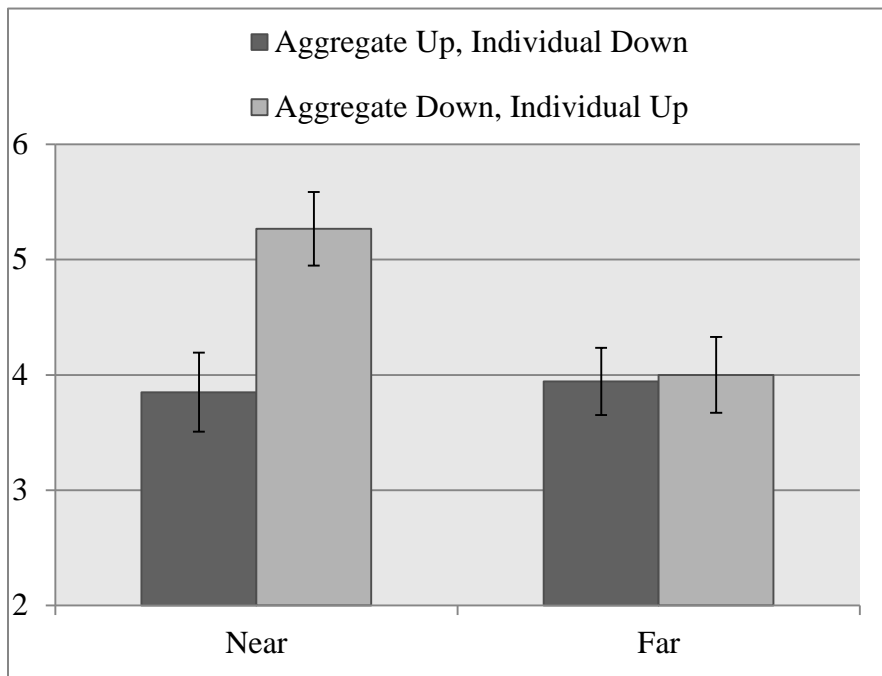


Figure 15. Study 3 mean satisfaction ratings by comparison and temporal distance conditions; participants with "some college".

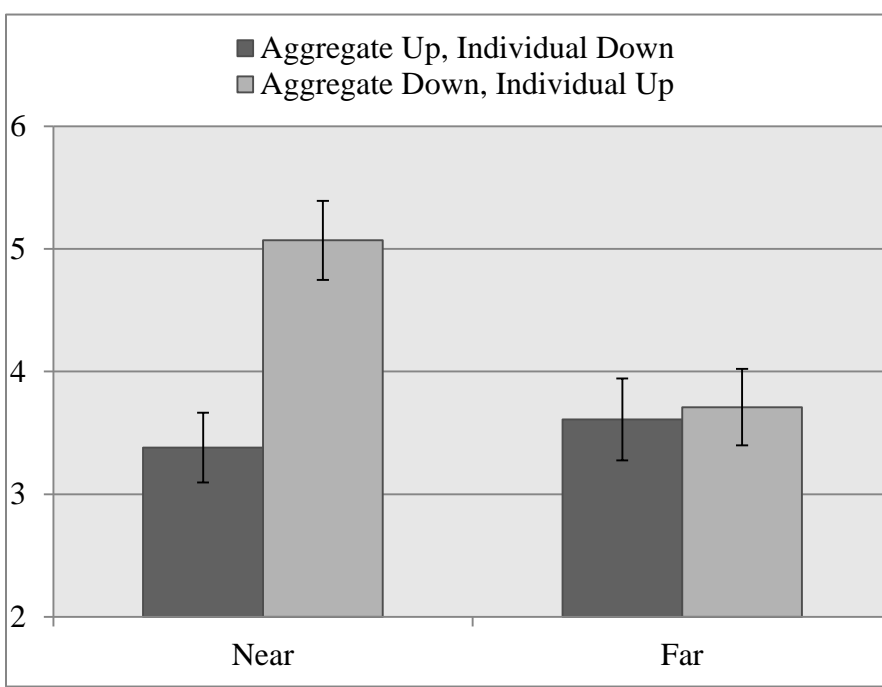


Figure 14. Study 3 mean performance ratings by comparison and temporal distance conditions; participants with "some college".



There was also a significant temporal distance x comparison x education-level interaction  $F(3, 147) = 2.89, p = .038, \eta_p^2 = .055$  on participants' ratings of performance. Simple effects test revealed that for participants with "some college" ( $N=60$ ), there was a main effect of comparison condition,  $F(1, 56) = 8.13, p = .006, \eta_p^2 = .127$ , such that participants who had downward aggregate comparisons ( $M=3.52, SD=1.31$ ) rated their performance as better than those who had upward aggregate comparisons ( $M=4.41, SD=1.24$ ). There was also a marginal main effect of temporal distance,  $F(1, 56) = 3.23, p = .078, \eta_p^2 = .055$ , such that participants in the near condition ( $M=4.29, SD=1.41$ ) rated their performance marginally better than those in the far condition ( $M=3.66, SD=1.23$ ). These main effects were qualified by a significant temporal distance x comparison interaction,  $F(1, 56) = 6.36, p = .015, \eta_p^2 = .102$ , see Figure 15.

Post-hoc analyses revealed that in the far condition, there was no effect of comparison, but in the near condition, participants who were above average rated their performance as better than participants who were below average ( $p = .001, d = 1.44$ ); these findings are the opposite pattern of predicted findings. For other education levels, there were no significant effects. Thus, the supplementary analyses do not suggest any obvious explanation for the results.

### Discussion

Overall, the results of Study 3 suggest that performing above average leads to greater satisfaction, and better rated performance than performing below average. No evidence of a local dominance effect was found, and instead, global dominance emerged across all conditions. Additionally, there was consistently no influence of the temporal distance manipulation on self-evaluations. While participants could accurately recall the temporal distance of the comparison information, there is no other evidence that the manipulation was effective: there was no change in the interpretation of comparison information, and there was no change in processing level as measured by the Kimchi-Palmer-Figure-Task which has widely been reported to demonstrate the effects of a successful psychological

distance manipulation (e.g., Basso & Lowery, 2004; Förster & Dannenberg, 2010; Marquardt, Förster, & Van Kleef, 2011).

A recent meta-analysis of psychological distance research (Soderberg, Callahan, Kochersberger, Amit, & Ledgerwood, 2013) suggests that across 74 studies, the average effect size of psychological distance manipulation is larger when the dependent measures are not related to the manipulations ( $d=.909$ ) than when they are related ( $d=.365$ ). In the current study, the psychological distance manipulation was embedded in the comparison information and directly related to the comparison dependent measures, which may explain the lack of significant findings. However, participants also completed the figures task which was completely unrelated to the distance manipulation, and still no differences emerged.

What is perhaps most interesting about these results collectively is that in the temporally distant conditions, a global dominance effect emerged as predicted, both on responses to comparison information and in the measure of processing level. It is the temporally proximal conditions that produced unexpected patterns. While it was predicted that psychological proximity (much like a concrete construal level) should be conducive to local dominance effects of comparison information and local processing levels on perceptual tasks, evidence of a global dominance effect was found.

Recent research (Maglio, Trope, & Liberman, 2012) suggests that one type of psychological distance (e.g., temporal, hypothetical, spatial, or social) reduces sensitivity to other psychological distance cues. It might be the case that a “co-participant” with no identifying information in an online study information is instantly perceived as being socially or spatially distant, rendering any further distance manipulations (in this case, temporal) ineffective. While this explanation could help in the interpretation of this study, it does not contribute to an understanding about how psychological distance affects the use of comparison information in general. There are always competing psychological

distance cues available in daily life; it is yet to be determined which cues become salient and which are subsequently ignored.

CHAPTER SIX  
THE IMPACT OF SPATIALLY PROXIMAL VERSUS DISTANT COMPARISON  
TARGETS ON THE RELATIVE WEIGHTING OF INFORMATION FROM  
INDIVIDUALS VERSUS AGGREGATES

**Study 4**

The primary goal of Study 4 was to test the effects of different type of psychological distance, specifically, spatial distance on the interpretation of comparison information from individuals and aggregates. In the previous study, the temporal distance manipulation had no effects on processing level or on the use of comparison information. This could have been a consequence of all of the comparison targets being perceived as psychologically distant from the participants, as the ostensible co-participants were potentially anywhere in the (virtual) world, and had no obvious common characteristics other than all being MTurk workers who completed that specific survey. Recent work (Maglio et al., 2013) suggests that psychological distance manipulations are not additive, so if there is one cue for distance (i.e., the ambiguity of an MTurk co-participant), any additional distance cues (i.e., temporal distance manipulations) might be superseded. Thus, the question remains if the psychological distance of comparison targets can influence how they are used to form self-evaluations. In Study 4, participants completed the study in a lab setting, and all social comparison information was based on supposed classmates in the same introductory psychology course as the participants; their location (i.e., down the hall versus across town) was the only manipulated factor. Thus, the spatial distance manipulation should have been the only distance cue made salient.

To assess the relative influence of individual comparison targets in Study 4, conditions were included in which there was only comparison information available from aggregate targets (i.e., a similar design to Study 2). Comparing self-evaluations of participants in these conditions to those receiving both aggregate and individual comparison information should ascertain whether individual targets had an impact on

how information from aggregate targets was used. If individual targets were given more relative weight than aggregate targets (i.e., if local dominance occurred), self-evaluations should be different when individual information is available versus unavailable.

### Predictions

It was predicted that comparing with spatially distant targets should result in a global dominance effect; in other words, self-evaluations should be more favorable when better than the aggregate than when worse, regardless of the availability of individual comparison targets. For participants comparing to spatially near comparison targets, a local dominance effect was expected. When only aggregate comparison information was available, it was predicted that participants would feel more favorably about themselves if they were better than the aggregate versus worse. However, when individual comparison information was also available (in the opposite direction of the aggregate information), it was predicted that those who were better than the aggregate would feel worse (than if no individual information was present) and those who were worse than the aggregate would feel better.

A secondary goal of Study 4—as in Study 3—was to demonstrate that increased psychological (i.e., spatial) distance influences perceptual processing level (as determined by the Kimchi-Palmer-figures-task) and that processing level mediates the use of comparison information. It was predicted that increases in spatial distance should lead to more global processing and, in turn, more use of average comparison information when making self-evaluations.

### Method

#### Participants and Design

One hundred ninety-one undergraduates were recruited to participate in a study of “Social Perceptiveness” in exchange for partial course credit. Data from one participant were dropped for recognizing the nature of the false feedback; this left a sample of 190 participants (68.9% female, 70% white, average age 18.97 years,  $SD=1.53$  years) Upon

arrival to the lab, participants were randomly assigned to one of eight conditions in a 2 (spatial distance: near, far) x 2 (aggregate comparison: upward, downward) x 2 (individual comparison: present, absent) between subjects design.

### Procedure and Materials

After each participant gave consent, the experimenter seated each at a computer and mentioned that experiment was also being conducted in another lab, which was either just down the hall (in the near condition) or at the University of Iowa's Oakdale Research Campus, which is approximately 10 miles away from the main campus (far condition).

As in Study 1, participants then read that the purpose of this experiment was to assess individuals' levels of social perceptiveness (all materials adapted from Buckingham & Alicke, 2002). Participants then completed the same lie detection task as in Study 1.

After participants completed the lie detection task, the computer generated their (bogus) scores (feedback adapted from Buckingham & Alicke, 2002). All participants were told they scored 8 out of 15 correct. They were also given information about the average score on the task (i.e., the aggregate comparison target), either a 4.02 (downward) or 12.02 (upward) out of 15 (decimal points were provided to make the "average" seem more plausible). And, in certain conditions, participants also saw feedback about their ostensible co-participants' performance (either a 12 or 4 out of 15). If both types of comparison feedback were present, they were always in opposite directions and sandwiched around the participants' scores.

As mentioned above, the psychological distance manipulation was first introduced to participants when the experimenter explained they were completing the study simultaneously with another lab. The manipulation was re-confirmed when the comparison feedback was provided. In the near condition, all comparison feedback (average and individual) was described as simply "other lab information", whereas in the far condition, it was described as "Oakdale Campus information".

### Dependent Measures

After receiving their (bogus) performance feedback, participants rated their satisfaction, performance, and lie detection ability on seven point scales (1= *very dissatisfied/poor*, 7= *very satisfied/good*). To assess whether or not the psychological distance manipulation affected processing level, participants completed the 23 item Kimchi-Palmer-figure-task (Kimchi & Palmer, 1982), as in Study 3.

### Manipulation Check

Next, participants were asked to recall their own score on the task, as well as the aggregate score and (depending on condition), the score of their co-participant. Participants also indicated where their co-participants were completing the study. For participants in the far condition, they were also asked what they knew about the Oakdale Research Campus in an open- ended question. Finally, participants were probed for suspicion about the false feedback and true nature of the study and then were fully debriefed.

### Results

All participants correctly remembered their own score on the lie detection task and were accurate in recalling the direction and location of their comparison target(s). See Table 7 for correlations between dependent measures and Table 8 for means and standard deviations of all measures.

Table 7. Study 4 correlations of dependent measures.

	(1)	(2)	(3)
(1) Satisfaction	1		
(2) Performance	.45***	1	
(3) Lie Detection Ability	.17*	.12	1

Note: \* indicates  $p < .05$ , \*\*\* indicates  $p < .001$ .

Table 8. Study 4 mean self-evaluations by comparison and spatial distance conditions.

Dependent Measures	Spatially Near						Spatially Far					
	Aggregate Up		Aggregate Downward		Aggregate Upward		Aggregate Downward		Aggregate Upward		Aggregate Downward	
	Individual Down	Individual Absent	Individual Up	Individual Absent	Individual Down	Individual Absent	Individual Up	Individual Absent	Individual Down	Individual Absent	Individual Up	Individual Absent
Satisfaction	2.98 (.66)	2.60 (.91)	2.85 (.57)	3.28 (.85)	2.97 (.80)	2.55 (.68)	3.00 (1.00)	2.86 (.77)	2.71 (.46)	2.71 (.69)	2.80 (.41)	3.43 (.65)
Performance	2.68 (.48)	2.67 (.82)	2.91 (.52)	3.19 (.64)	2.81 (.60)	2.71 (.46)	2.80 (.41)	3.21 (.43)	2.71 (.69)	2.71 (.69)	2.80 (.41)	3.43 (.65)
Lie Detection Ability	3.05 (.85)	3.00 (.85)	3.09 (.63)	3.19 (.69)	3.10 (.75)	2.71 (.69)	3.13 (.52)	3.43 (.65)	2.71 (.69)	2.71 (.69)	3.13 (.52)	3.43 (.65)

Note: Standard deviations appear in parentheses.



### Satisfaction

Satisfaction ratings were subjected to a spatial distance x aggregate comparison x individual comparison ANOVA. A main effect of aggregate comparison condition emerged,  $F(1, 182) = 4.25$ ,  $p = .041$ ,  $\eta_p^2 = .023$ , such that participants who had downward aggregate comparisons ( $M = 3.02$ ,  $SD = .79$ ) were more satisfied than those with upward aggregate comparisons ( $M = 2.76$ ,  $SD = .76$ ). This was qualified by an aggregate x individual comparison interaction,  $F(1, 182) = 4.49$ ,  $p = .035$ ,  $\eta_p^2 = .024$ ; see Figure 16.

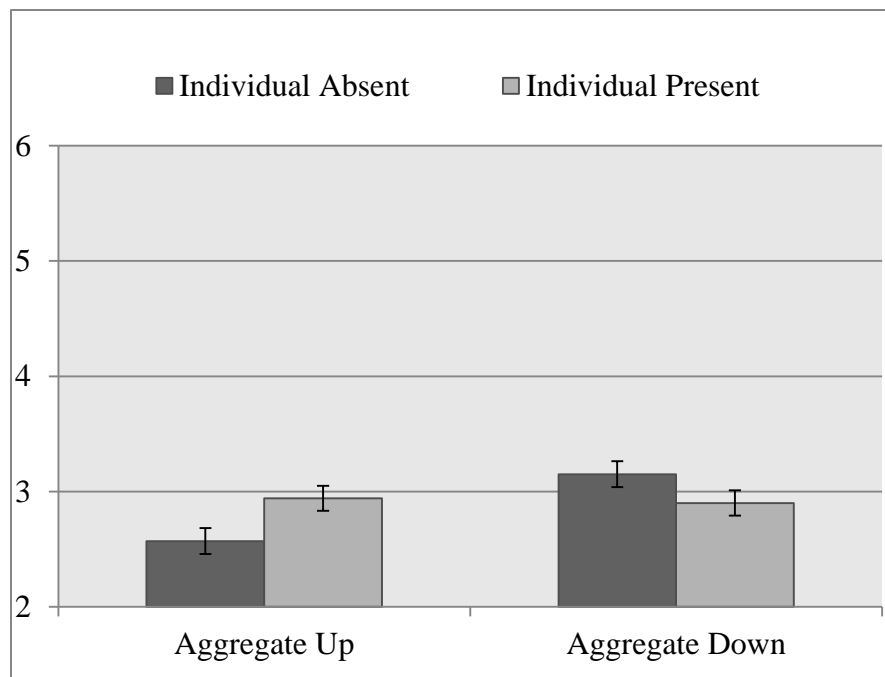


Figure 16. Study 4 mean satisfaction ratings by aggregate and individual comparison conditions.

Collapsed across spatial distance manipulation, pairwise comparisons show that participants with only aggregate comparison information felt more satisfied if it was downward ( $M = 3.15$ ,  $SD = .84$ ) rather than upward ( $M = 2.57$ ,  $SD = .75$ ) in nature,  $p < .001$ ,

$d = .73$ . There were no differences between conditions when participants had both aggregate and individual comparison information. To assess the relative impact of the individual targets, satisfaction was compared between conditions when there was only aggregate information versus conditions when there was both aggregate and individual comparison information. Satisfaction was greater for participants with both upward aggregate and downward individual comparison information available ( $M = 2.94$ ,  $SD = .74$ ) than just upward aggregate comparison information ( $M = 2.57$ ,  $SD = .74$ ;  $p = .017$ ,  $d = .50$ ). Conversely, satisfaction was marginally lower for participants with both downward aggregate and upward individual comparisons ( $M = 2.90$ ,  $SD = .72$ ) than those with only downward aggregate comparisons ( $M = 3.15$ ,  $SD = .84$ ;  $p = .106$ ,  $d = .32$ ). In other words, across spatial distance conditions, there was evidence of a relative local dominance effect. While there was no evidence that spatial distance had an influence on the use of comparison information, simple effects were analyzed based on *a priori* hypotheses.

#### Spatially Near

For participants in the near condition ( $N = 99$ ), a main effect of aggregate comparison condition emerged,  $F(1, 95) = .407$ ,  $p = .047$ ,  $\eta_p^2 = .041$ , such that those with downward aggregate information ( $M = 3.06$ ,  $SD = .75$ ) felt more satisfied than those with upward aggregate information ( $M = 2.76$ ,  $SD = .78$ ). This was also qualified by an aggregate x individual interaction,  $F(1, 95) = 5.34$ ,  $p = .023$ ,  $\eta_p^2 = .053$ ; see Figure 17.

A local dominance effect was predicted such that the inclusion of individual comparison information should negate the impact of aggregate comparison information. For participants with downward aggregate comparison information, this was the case; participants who received only aggregate information felt more satisfied than participants who also had individual comparison information ( $p = .021$ ,  $d = .59$ ). However, for participants receiving upward average comparison information, there was no difference in satisfaction for participants who had individual comparison information or not (n.s.).

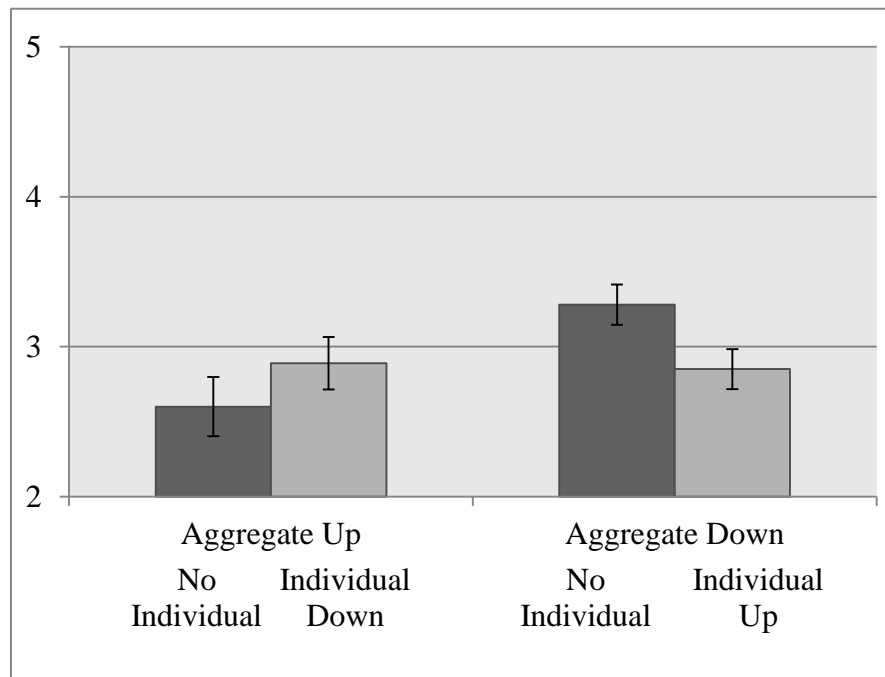


Figure 17. Study 4 mean satisfaction ratings by aggregate and individual comparison conditions; spatially near condition only

### Spatially Far

For participants in the far condition (N=91), a global dominance was predicted such that aggregate comparison information should be more predictive of satisfaction than individual. However, participants who had downward aggregate comparison information were no more satisfied than those who had upward aggregate information (n.s.). Additionally, there were no effects of individual comparison condition.

### Secondary Dependent Measures

#### Performance

A significant effect of aggregate comparison condition emerged on participants' performance ratings,  $F(1, 182) = 12.88, p < .001, \eta_p^2 = .066$ , such that those who had upward aggregate information ( $M = 2.73, SD = .57$ ) rated their performance as worse than

those who had downward aggregate information ( $M= 3.03, SD= .56$ ). There was also a marginal effect of individual condition,  $F(1, 182)= 2.78, p=.097, \eta_p^2= .015$ , such that those without individual comparison targets ( $M= 2.95, SD= .64$ ) provided higher ratings than those with individual targets ( $M= 2.82, SD= .53$ ). The two main effects were qualified by an aggregate x individual interaction,  $F(1, 182)= 5.42, p=.021, \eta_p^2= .029$ . See Figure 18. Collapsed across spatial distance conditions, pairwise comparisons show that for participants without individual comparison information, having downward aggregate information ( $M= 3.20, SD= .58$ ) led to more favorable ratings than having upward aggregate information ( $M= 2.70, SD= .59, p<.001, d= .85$ ).

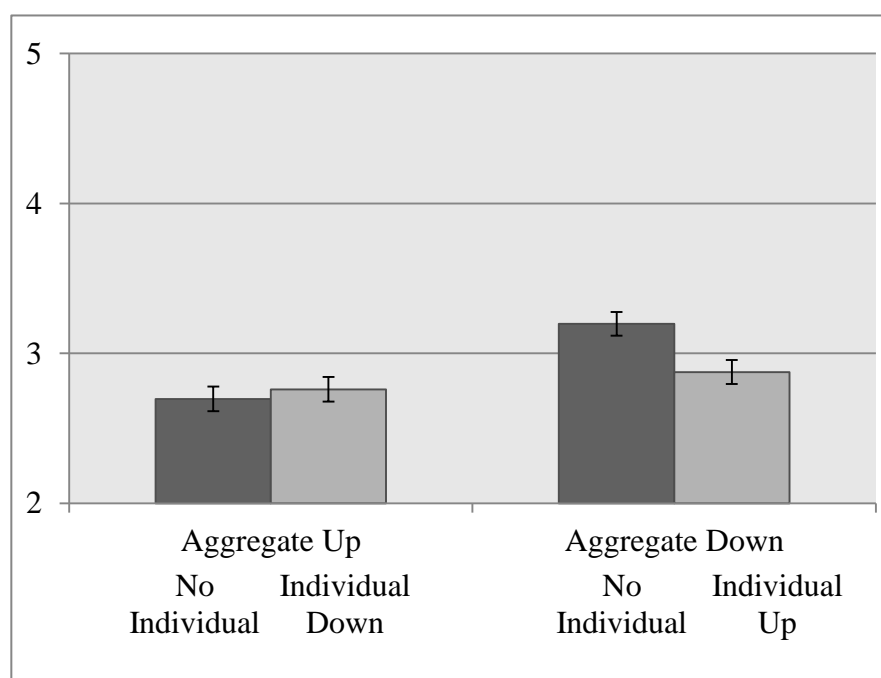


Figure 18. Study 4 mean performance ratings by aggregate and individual comparison conditions.

While there was no evidence that the spatial distance manipulation had an effect on participants' self-evaluations, simple effects were assessed based on *a priori*

hypotheses. For participants in the near condition, a global dominance effect emerged, contrary to predictions; downward aggregate targets (M= 3.05, SD= .60) led to better ratings than upward targets (M= 2.68, SD= .64;  $F(1, 95)= 8.33, p=.005, \eta_p^2= .081$ ).

For participants in the far condition, however, a relative local dominance effect emerged. For participants without comparison information from individuals, performance ratings were better for participants with downward aggregate information than upward aggregate information ( $p=.002, d= .43$ ). Participants with individual targets did not differ across aggregate comparison conditions. These differences were qualified by an aggregate x individual interaction,  $F(1, 87)= 5.10, p=.026, \eta_p^2= .055$ , and were in the opposite direction of what was predicted.

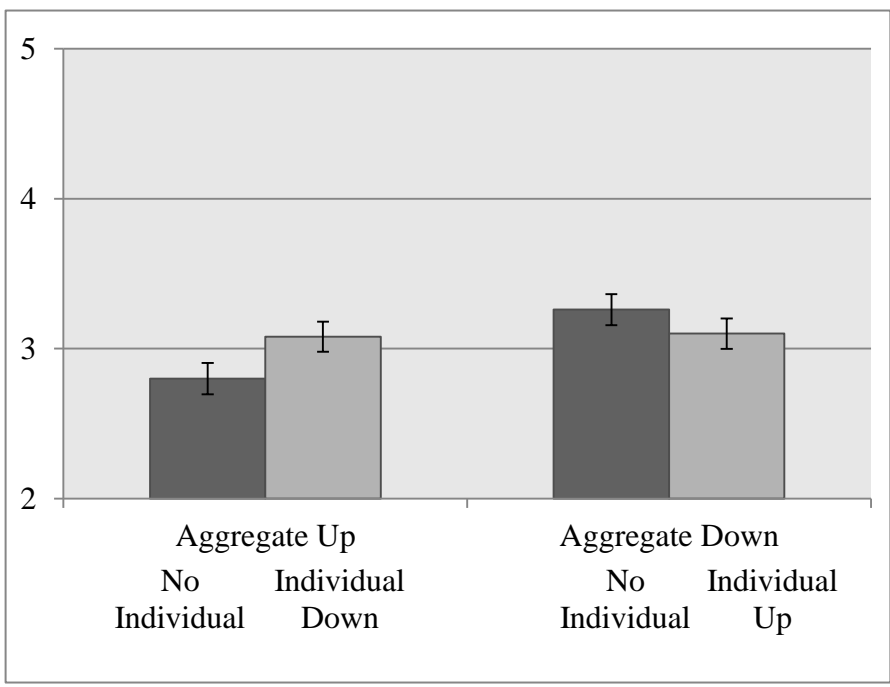


Figure 19. Study 4 mean lie detection ability ratings by aggregate and individual comparison conditions.

## Ability

A main effect of aggregate condition emerged on participants' ratings of lie detection ability,  $F(1, 186) = .553, p = .02, \eta_p^2 = .029$ , such that participants who had downward aggregate information ( $M = 3.18, SD = .64$ ) rated their ability better than those who had upward ( $M = 2.95, SD = .77$ ). An aggregate x individual interaction also emerged,  $F(1, 186) = 4.47, p = .036, \eta_p^2 = .023$ ; see Figure 19.

Pairwise comparisons revealed a pattern consistent with a relative local dominance effect; participants without information from individuals rated their ability as greater when they had downward aggregate ( $M = 3.26, SD = .68$ ) information versus upward ( $M = 2.80, SD = .75; p = .002, d = .64$ ). However, participants who did have comparison information from individuals did not differ in their self-evaluations. Consistent with findings of Buckingham and Alicke (2002), the relative local dominance effect was especially evident for participants with upward (i.e., threatening) aggregate information; the inclusion of a downward individual target ( $M = 3.08, SD = .78$ ) resulted in better ratings than when they were not present ( $M = 2.80, SD = .75, p = .057, d = .37$ ).

## Processing Level

Participants' processing level (i.e., global or local) was determined by scoring the Kimchi-Palmer-figure-task. Higher scores (maximum of 23) indicate more global processing. It was predicted that participants in the psychologically far condition should demonstrate more global processing, but there were no differences between those in the far ( $M = 16.80, SD = 6.32$ ) and those in the near ( $M = 16.06, SD = 6.66$ ) conditions. Processing scores were both significantly different from the midpoint (11.5 out of 23 possible), suggesting overall global processing ( $p's < .001$ )

## Recall Accuracy

Because in Pilot Study 1 there was an influence of construal level mindset on participants' average score recall accuracy, it was predicted that participants who had psychologically far comparison targets would be more accurate than those with near

targets. Participants who accurately recalled the score of the average comparison target were scored as a +1, and those who were inaccurate were scored a 0. A chi-squared test was conducted, but no differences between spatial distance conditions emerged;  $\chi^2(1, N=190) = .70, p = .402$ .

### Supplementary Analyses

Because there was no evidence that the spatial distance manipulation caused a change in processing level, or in the use of comparison information, supplementary analyses were conducted to assess the role of processing level on the use of comparison information. Participants' processing level index, as indicated by their score on the Kichi-Palmer figure task, was entered as a covariate in an aggregate x individual ANOVA. No effects of processing level emerged on satisfaction, performance, or ability ratings; nor did including the covariate change the patterns of results.

Because the patterns of results were not consistent with predictions, demographic variables were examined for possible explanations. Gender, age, and ethnicity were entered into the design; there were no effects of any demographic variables entered.

### Discussion

The results of Study 4 were inconclusive. While there was fairly consistent evidence that performing better or worse than average influences self-evaluations and evidence that comparison information from individual targets was (relatively) disproportionately weighted (i.e., a relative local dominance effect), there was no evidence that psychological distance changed the way comparison information was used. It is difficult to determine if psychological distance really has no effect, or if the distance manipulation that was utilized was just ineffective. In other words, the present study did not offer many clues as to the role of psychological distance for understanding the effects of social comparison feedback.

Across all three dependent measures, there was consistent evidence that overall, both individual and aggregate targets mattered for self-evaluations. While performing

better than an average was associated with more favorable self-evaluations, relative local dominance effects also consistently emerged. In other words, the inclusion of individual comparison information (in the opposite direction as aggregate information) changed self-evaluations disproportionately and reduced the impact of the aggregate comparisons.

While no significant effects of spatial distance emerged, the patterns differed slightly when comparing with near vs. far targets. For satisfaction ratings, participants in the near condition exhibited a relative local dominance effect, as expected; however, in the far condition, relative standing with the aggregates did not predict ratings. For ratings of performance, the patterns of results in the near and far conditions were in the opposite of the expected patterns. In the near condition, participants exhibited a global dominance effect, and in the far condition, they exhibited a relative local dominance effect. While these differences are interesting, they are inconsistent with predictions and inconsistent with each other.

As in the previous experiments, there was no evidence that a psychological distance manipulation, in this case a spatial distance manipulation, influenced perceptual processing level although other studies consistently demonstrate this effect with small-to-moderate effect sizes (average  $d=.402$ ; Soderberg et al., 2013). There was also no direct impact of spatial distance on accuracy of recalling the average comparison target. Additionally, none of the supplementary analyses provided any insights to these puzzling results.



## CHAPTER 7

### CONCLUSIONS AND IMPLICATIONS: THE EFFECT OF CONSTRUAL LEVEL AND PSYCHOLOGICAL DISTANCE ON THE USE OF INDIVIDUAL AND AGGREGATE COMPARISON INFORMATION

Six studies tested the influence of construal level or psychological distance on the utilization of comparison information from averages versus individuals. Across all studies, a global dominance effect was predicted for individuals with abstract mindsets or psychologically distant targets, such that self-evaluations should have been influenced by relative standing with the aggregate. In other words, it was expected that performing above average on a task would lead to more favorable self-evaluations than performing below average; regardless of relative standing with individual co-participants. For participants in concrete mindsets or with psychologically proximal targets, a local dominance effect was expected. In other words, it was predicted that relative standing with individual comparison targets (when available) would have a disproportionate effect on self-evaluations.

#### **Summary of Results**

Two pilot studies provided initial evidence that construal level influences the use and interpretation of social comparison information. In the first pilot study, online participants completed a trivia task and were given comparison information about an individual and the average score on the task. Before receiving that feedback, construal level was manipulated by putting participants in an abstract or concrete mindset by asking them to focus on why or how to improve or maintain their health. Results indicated that self-evaluations of participants who were in an abstract mindset were more

influenced by average comparison information, such that learning they performed better than the aggregate led to greater satisfaction than worse than the aggregate. This was true despite the fact that they also received comparison information in the opposite direction from an individual target. Thus, participants in an abstract mindset exhibited a global dominance effect. However, self-evaluations of participants in a concrete mindset were not different based on comparison condition. This could be viewed as consistent with a local dominance effect; receipt of information about the performance of an individual target was sufficient to “undo” the influence of being above or below on aggregate.

Pilot Study 2 tested whether an abstract mindset prompted people to assimilate towards the individual comparison target or contrast away from the aggregate target. Other research (Forster, 2008) has demonstrated that an abstract mindset facilitates assimilation and general similarity testing, because such a mindset leads to thoughts about large categories. Although Study 2 followed the same procedures as those in the first study, participants compared only with individuals in some conditions. Results suggest that abstract mindsets can produce contrast as well as assimilation; participants contrasted away from individual comparison information when it was the only type available and contrasted away from the average when both types were present. These findings offered additional support for the main hypothesis that abstract mindsets lead to relying more on comparison information from aggregates when forming self-evaluations.

Study 1 tested the generalizability of the effects found in the pilot studies by providing comparison feedback about performance on a lie detection task rather than a trivia task. Another important feature of Study 1 was that it was conducted in a laboratory setting where the individual comparison targets were actual co-participants seated at

neighboring computers, which might have created an environment more conducive to producing a local dominance effect (e.g., Buckingham & Alicke, 2002). Results of Study 1, however, were inconsistent. Satisfaction ratings replicated the patterns of the pilot studies: those in an abstract mindset were more satisfied when they performed better than an aggregate versus below; whereas satisfaction of participants in the concrete mindset condition did not differ by comparison condition. Performance evaluations, however, were only influenced by relative standing with the aggregate. An interaction emerged for ratings of social perceptiveness, a more diffuse evaluative attribute, but the results were formed no interpretable pattern. In sum, the results of Study 1 seem to identify inconsistencies in the effects of construal level on the use of individual and aggregate comparison information.

Study 2 tested a different manipulation of construal level (used by construal level researchers) to assess the generalizability of the effect of construal on the use of comparison information; instead of manipulating abstract versus concrete mindsets by thinking about “why” versus “how” to do something, participants listed “categories” versus “exemplars” (adapted from Fujita et al., 2006). Study 2 also added conditions in which there was only comparison information from an aggregate available; by comparing these conditions to those that also presented individual comparison information, the relative impact of individual comparison information should have been identified. It was predicted that in the abstract (category) condition, only aggregate comparisons should influence self-evaluations, but in the concrete (exemplar) condition, individual comparisons should influence self-evaluations.

Across all dependent measures, performing better than the aggregate consistently led to more favorable self-evaluations than performing worse than the aggregate, but there was no evidence of a local dominance effect in any condition; the inclusion of comparison information from an individual did not temper or change the effects of the aggregate feedback. Additionally, there was no evidence that the category versus exemplar construal manipulation had any effect on self-evaluations. Of note, the predicted global dominance effect emerged in the abstract mindset condition, but results were inconsistent with predictions for those in the concrete mindset condition. This could either mean that the category/exemplar task failed to manipulate construal level, or that the impact of construal level on the use of social comparison information was too weak to demonstrate consistent effects on self-evaluations. Put another way, construal level might have an effect on self-evaluations, but the general effect of learning one has performed better or worse than others seems to be predominant.

In Study 3, the psychological distance (specifically temporal distance) of comparison targets was manipulated, rather than manipulating the construal level mindset. Participants were told that the individual and average comparison information (both types were always present) was collected more than a year before or immediately prior their participation. In addition to making self-evaluations after receiving comparison information from temporally recent or far targets, level of processing was also measured using a perceptual figure task (Kimchi & Palmer, 1982). Temporally distant targets should have produced global dominance comparison effects and global processing, whereas temporally recent targets should have led to local dominance and local processing.

Contrary to the hypotheses, results of Study 3 showed no effects of temporal distance. Participants' satisfaction and performance ratings differed only by comparison condition; evaluations were more favorable when better than the aggregate versus worse. Other measures of behavioral intention showed no effects, even of comparison condition. The measure of processing level also showed no differences between distant versus near targets, suggesting that the manipulation was unsuccessful. As in prior studies, the far condition (analogous to previous abstract mindset conditions) led to predicted effects: global dominance effects in terms of comparison ratings, and global processing levels. As before, in the near (analogous to concrete mindset conditions) condition there was no evidence of local dominance or local processing. These surprising findings raise the question whether virtual comparison targets could ever be considered psychologically near.

As a further experimental test, Study 4 was designed to examine the effects of psychological distance (specifically spatial distance) in the lab with the hope that presence of more concrete comparison targets might facilitate local dominance. Participants completed a lie detection task and received aggregate comparison information about performance from a lab (and in some conditions, a co-participant) that was ostensibly down the hall, or at a research campus across town. As in Study 3, participants also completed a perceptual processing task to measure processing level.

It was predicted that participants with proximal comparison targets should give relatively disproportionate weight to individual comparison targets and manifest more local processing. In contrast, participants with distal comparison targets should rely more on average comparison targets when forming self-evaluations and exhibit global

processing. Results showed trends for a relative local dominance effect regardless of spatial distance. However, these results were not consistent or clear, and there was no clear evidence that the spatial distance of the comparison targets affected processing levels.

### **Conclusions**

Across all six studies, participants generally felt more positively about themselves if they performed better than an aggregate versus worse—regardless of the presence or absence of an individual comparison target and regardless of concrete versus abstract mindsets (or psychological distance of the targets). A meta-analysis of the Pilot Study 1 and Studies 1-4 demonstrates that the average weighted effect size of the upward versus downward aggregate conditions is  $d = .410$ ; in other words, across all individual comparison target conditions and construal or psychological distance conditions, status relative to an aggregate comparison target had a small to moderate effect on performance satisfaction.

Even in the concrete mindset or psychologically proximal conditions when it was predicted that individual comparison targets would be given (relatively) more weight when forming self-evaluations, relative standing with the aggregate was the best predictor. Again, the meta-analysis revealed that for participants in a concrete mindset or with psychologically proximal comparison targets, downward aggregate targets led to greater satisfaction than upward aggregate targets (weighted average  $d = .406$ ).

However, in support of the predicted global dominance effect, participants in the abstract mindset or psychologically distant conditions generally made more favorable self-evaluations if they learned they performed above average rather than below average

(weighted average  $d = .627$ ). While the pattern of results is similar across both the concrete/proximal conditions and the abstract/distal conditions, the effects of aggregate comparison are notably larger for participants in an abstract mindset (or with distal targets). This suggests that, while results are inconsistent, perhaps an abstract mindset is more conducive to the utilization of aggregate or average comparison information. The evidence offered from the meta analysis suggests that it is important to more closely examine the three types of influences that demonstrate effects in this research area: social comparison with aggregate targets, social comparison with individual targets, and finally construal level factors.

### Social Comparison

#### Aggregate Targets

Across studies, the most robust effect was that relative standing with aggregate comparisons to predict self-evaluations and performance satisfaction. This is consistent with a large portion of the empirical literature on social comparison (e.g., Morse & Gergen, 1970; Wills, 1981) with respect to prediction of health behaviors, and general self-evaluations. In fact, comparison information from averages or aggregates is utilized when assessing risk even when objective risk level is known (Klein, 1997).

#### Individual Targets

According to some researchers, individual comparison targets are relied upon more than aggregate targets and this local dominance effect has broad implications for self-evaluation and judgments of risk (e.g., Zell & Alicke, 2010; Alicke, Zell & Bloom, 2010). However, there is some research suggesting the local dominance effect is not a robust phenomenon and critically depends on factors such as the proximity or salience of

a local target (e.g., Buckingham & Alicke, 2002). Although the present research found a few effects that could be considered to be consistent with a (relative) local dominance effect (e.g., when there were no differences between comparison conditions, or when the inclusion of an individual target negated differences caused by aggregate targets), there was no consistent or clear evidence that participants disproportionately weighted information from the individual comparison targets over the aggregates. This might be due to the fact that the majority of the studies (four of six) were conducted online with an un-identified ambiguous co-actor available as a “local” or “individual” target; but, there was a lack of consistency of findings even from lab studies.

Recent work (Zell & Alicke, 2013) suggests that in order to unambiguously assess the dominance of a local comparison target, it is necessary to include conditions that only provide average comparison information (and not local/individual comparison information). The relative local effect can then be detected by comparing conditions where there is both average and individual comparison information available versus when there is only average comparison. Two of the present experiments (Studies 2 and 4) included these “essential” features to assess the relative weighting (or dominance) of an individual comparison target. However, these studies provided inconsistent evidence about the role of the individual target. In Study 2, conducted online, there was no evidence that an individual target exerted disproportionate weight on self-evaluations. However, in Study 4, conducted in the lab, individual targets clearly and consistently tempered the impact of upward or downward aggregate targets, demonstrating relative local dominance. The only conclusion the present research can offer is that local



dominance effects can be found in some cases, but they are much less robust than prior researchers have assumed.

While phenomena related to the local dominance effect like the big-fish-small-pond effect, the frog pond effect, and the local ladder effect seem robust and representative of daily life (e.g., Marsh & Hau, 2003; Anderson et al., 2012), they are not manifested as commonly in lab settings. One thing that the real-world effects have in common, which lab studies of local dominance do not, is the access to truly local targets. When people compare with local or individual others in day-to-day life, those individuals are usually familiar to the people comparing. They are salient, and in some cases, relevant comparison targets. In lab settings, even if an individual comparison target is present, he or she is most likely still an unfamiliar or anonymous target. Hence, to obtain local dominance effects, comparison targets may have to be known and/or relevant to the person making comparisons.

### Construal Level Theory

This present work also attests to the subtlety of priming construal level or psychological distance. While past research tends to treat construal and psychological distance manipulations as interchangeable, the present research provides evidence that not all manipulations are “created equally.” While across studies, there are differences in effect sizes for concrete versus aggregate conditions, within each study, the patterns were very inconsistent. The reason for the inconsistency may be connected to the fact that the majority of construal level research involves persuasion, impression formation, purchasing decisions, or other general judgments and decisions (e.g., Trope & Liberman, 1998; Ledgerwood et al., 2010). The present experiments involve judgments of the self.

Because the processing of information about the self is typically more motivated and salient, perhaps construal effects require highly self-relevant manipulations.

For example, the manipulation created by Freitas and colleagues (2004) instructs people to think about their own goals or their own steps towards reaching goals. This task could be seen as highly self-relevant and has demonstrated effects on self-judgments of morality (Conway & Peetz, 2012), as well as in Pilot Studies 1-2 and Study 1 of this document. However, the category exemplar task created by Fujita and colleagues (2006) does not involve the self at all—instead, it primes people with larger categories or specific exemplars. While this task has an influence on tasks such as stereotyping, attitude consistency, and self-control (McCrea et al., 2011; Ledgerwood et al., 2010; Fujita et al., 2006), there is no evidence in the literature that it changes self-judgments.

Regardless of the manipulation used, construal effects, like any type of priming may be subtle in nature. The majority of published research reports the direct and immediate effects of construal level priming, rather than long-lasting effects. In the local dominance paradigm, construal primes may compete with too much other information to reliably influence the use and interpretation of social comparison information.

### Psychological Distance

As noted earlier, many psychological distance manipulations are used interchangeably with construal level manipulations in the empirical literature because the effects between the two have been shown to be bi-directional (e.g., Bar-Anan et al., 2006; Henderson et al., 2011).

In this regard, Soderberg and colleagues (2013) are conducting an ongoing meta-analysis to assess the impact of different psychological distance manipulations on

construal level and downstream consequences of construal level (e.g., decisions, evaluations, self-control). Thus far, 74 studies have been evaluated. Soderberg et al., found that hypothetical distances (e.g., “imagine an event happening in a far/near location”) have a greater effect (average  $d = .628$ ) than real distances do (e.g., “this event is taking place in your city/ across the country”) on later judgments (average  $d = .395$ ). Effects are also greater when the distance manipulation is unrelated to dependent measures (e.g., thinking about a memory from one week vs. one year ago, then making a purchasing decision on a novel product; average  $d = .909$ ), than when they are related (e.g., judging a person who is far away or nearby; average  $d = .365$ ). The two studies described above used distance manipulations that both involved real distance and dependent measures that were related to the manipulation, so it is likely that any effects that do exist, would be more difficult to detect because of the quirks of psychological distance.

On the basis of the present experiments, it has difficult to determine if the construal and psychological distance manipulations were unsuccessful (or inconsistently successful), or if the effects of construal and psychological distance on the use of comparison information are not robust. There is also the possibility that both things are operating.

Of note, the conditions producing the most unexpected results were the concrete or psychologically near conditions. Although the potential necessary conditions to elicit a relative local dominance effect have already been discussed, a consistently effective concrete or psychologically proximal manipulation of construal also is required. Although, the manipulations utilized in the present studies were the conventional ones

reported in the literature, the logical conclusion is the conventional manipulations are not as robust as the literature suggests. A further complication comes from Maglio and colleagues (2012), who suggest that one psychological distance cue can reduce sensitivity to any further distance. In other words, if one cue is salient, other cues may no longer be considered. Because there are so many psychological distance cues in the paradigms used in this research (as well as in the environment), it is possible that distance cues associated with the virtual world (for online studies) or the inherent abstraction in participating in ambiguous tasks as part of a psychology experiment may override any of the concrete or proximal manipulations.

## **Implications**

### Theoretical Implications

Although the present experiments highlighted the inconsistencies and subtleties of the effects of construal level on the local dominance effect, consideration of the interrelationships between construal level theory and social comparison remains important. There has been little acknowledgment of their overlap or how the nexus of construal and comparison may have implications for self-evaluations and behavior. The theoretical implications of this project extend to both social comparison theory and construal level theory.

It is important to understand how contextual cues like psychological distance or abstract (concrete) mindsets might influence the interpretation of social comparison information. In addition to understanding the relationship between construal level and the local dominance effect, future work could help to explain effects of other types of comparisons as well. Temporal comparisons, or comparing to a “previous self,” have

been shown to have more impact than social comparisons in some situations (Zell & Alicke, 2009b). That is, improving over time increases the self-concept as much or more than being above average or better than another person. However, research on temporal comparisons has not considered that comparing to a “past” self might induce an abstract mindset. It could be the case that a concrete mindset would facilitate the use of comparison information over temporal comparison information.

There has also been much research on comparisons within- and between-groups that has not considered the factor of social distance. While this is akin to the intra- or inter- group comparisons of the frog pond effect, comparing to an individual in-group or out-group member has also been shown to affect the outcomes of comparisons (e.g., Blanton, Crocker, and Miller, 2000). Understanding the relationship between the construal cues presented by a comparison target or the context in which the comparison is being made and the outcome of a social comparison could help to better understand when, why, and with whom people compare themselves.

Construal level theory has generated an extensive literature demonstrating that construal level and psychological distance exert a substantial effect on the way we view the world and judge people, events and things; however, little research has investigated the effects of construal on self-perceptions (exceptions: Smith et al., 2008; McCrae et al., 2012). The present research sheds some light about how differences in construal level can lead to changes in self-concept.

#### Practical Implications

Because we are constantly either consciously or unconsciously comparing ourselves to others, it is important to understand conditions when these comparisons have

more or less impact on self-evaluations and subsequent behaviors. The present research has expanding implications as technology including smart phones, social media, and the internet become more pervasive in society and numbers of potential comparison targets increase. Whereas people historically only have information about others immediately around them, technological advances now make it possible for people to get information about other people anywhere in the world at any time. As the world gets smaller, our experience with psychologically distant comparisons will continue to grow.

Understanding the effects of psychological distance on social comparisons may also have broad implications for fields like education or health care. These fields commonly offer normative-aggregate information about issues that the public may already have anecdotal information about, such as national averages on college entrance exams (in addition to knowledge of how specific persons performed on the tests), or average risk statistics for diseases or other health issues (in addition to knowledge of friends' or family members' specific risks). Since the general tendency is for people to give more weight to anecdotal evidence from individuals, the results of the present experiments may enhance understanding about how to best present complex social comparison information to facilitate better and more informed decisions.

## APPENDIX A

Table A1. Pilot Study 1 trivia questions and response options.

Trivia Question	Response	Frequency
Which country has more tractors per capita?	<b>Iceland</b>	<b>41.2</b>
	Canada	58.8
What animal can last longer without water than a camel?	<b>Rat</b>	<b>68.1</b>
	Chipmunk	31.9
Which state accounts for more oil produced in the U.S.?	Texas	35.3
	<b>Alaska</b>	<b>64.7</b>
What U.S. president had the shortest life?	<b>Kennedy</b>	<b>81.5</b>
	Lincoln	18.5
Where did surfing originate?	Australia	41.2
	<b>Hawaii</b>	<b>58.8</b>
What is the most common name in the world?	Li	22.7
	<b>Mohammed</b>	<b>77.3</b>
How many muscles does a caterpillar have in its body?	Less than 200	39.5
	<b>More than 2000</b>	<b>60.5</b>
What is the most popular name for boats?	<b>Obsession</b>	<b>24.4</b>
	Carpe Diem	75.6
What European country has the lowest divorce rate in the world?	<b>Italy</b>	<b>65.5</b>
	France	33.6
What country sends the most tourists to Australia?	<b>Japan</b>	<b>58</b>
	United States	42
How much does the average hummingbird weigh?	4 oz	29.4
	<b>1 oz</b>	<b>70.6</b>
Lightning strikes the planet up to how many times per minute?	2000	46.2
	<b>6000</b>	<b>53.8</b>
What creature does not sleep?	Ants	75.6
	Hummingbirds	24.4
What percentage of jellyfish is water?	75%	21.8
	<b>95%</b>	<b>78.2</b>
What is a group of jellyfish called?	A hip	21
	<b>A smack</b>	<b>79</b>
Approximately what percent of movies released are rated R?	<b>55%</b>	<b>58</b>
	15%	42
Which animal makes a louder noise?	Lion	17.6
	<b>Blue Whale</b>	<b>82.4</b>
What color can zebras not see?	Purple	49.6
	<b>Orange</b>	<b>50.4</b>

Table A1—continued.

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Which of these two fruits is not native to North America?	<b>Peaches</b>	<b>57.1</b>
	Blueberries	42.9
What was the most popular baby name for girls between 1900 and 1909?	Maude	21
	<b>Mary</b>	<b>79</b>

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Note. Correct responses are in bold.



## APPENDIX B

Table B.1. Pilot Study 2 and Study 2 trivia questions and response options.

Trivia Question	Response	Frequency
Which can go longer without water	<b>a rat</b>	<b>12.9</b>
	a camel	87.1
How many times a second can a woodpecker peck?	200	31.9
	<b>20</b>	<b>68.1</b>
How many taste buds does a catfish have?	<b>1,000</b>	<b>53.3</b>
	100	46.7
What was George Washington's favorite horse's name?	Trenton	34.8
	<b>Lexington</b>	<b>65.2</b>
Which state has more presidential burial sites?	<b>Ohio</b>	<b>28.1</b>
	Maryland	71.9
Carnegie Hall opened in 1891 with whom as the guest conductor?	<b>Tchaikovsky</b>	<b>51.9</b>
	Chopin	48.1
Which historical figure has been portrayed on film more?	Abraham Lincoln	50
	<b>Napoleon</b>	<b>50</b>
	<b>Bonaparte</b>	
In what year was Christmas declared a national holiday in the U.S.?	1824	44.8
	<b>1890</b>	<b>55.2</b>
What was the first coin to be minted in the U.S.?	<b>Silver Dollar</b>	<b>57.6</b>
	Copper Penny	42.4
Which was the first state to allow women to vote?	Virginia?	57.6
	<b>Wyoming</b>	<b>42.4</b>
Which ocean is saltier?	The Pacific	52.4
	<b>The Atlantic</b>	<b>47.6</b>
	<b>Gateway Arch</b>	<b>46.7</b>
Which is the tallest monument in the U.S.	Washington Monument	53.3
	<b>Hydrogen</b>	<b>85.2</b>
Which element is more plentiful in the universe?	Helium	14.8
	The Coliseum	21.4
Which is older?	<b>Stonehenge</b>	<b>78.6</b>
	<b>132</b>	<b>58.1</b>
How many rooms are in the White House	116	41.9
	Kolkata	16.7
Which Asian city is more populous?	<b>Beijing</b>	<b>83.3</b>
	<b>South Africa</b>	<b>29</b>
Which country produces more wine?	Portugal?	71
	Seinfeld	49.5
Which TV sitcom ran longer?	<b>Friends</b>	<b>50.5</b>

Table B.1—continued.

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Which country produces more vehicles per year?	<b>Germany</b>	<b>51.4</b>
	U.S.	48.6

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Note. Correct responses are in bold.

## APPENDIX C: CATEGORY VERSUS EXEMPLAR TASK

### Category (Abstract) Instructions

In this task, you will be provided with a series of exemplars. Your task will be to write a word that you think each provided word is an example of. That is, ask yourself the question, "[Provided exemplar] is an example of what?" and then write down the answer that you come up with.

For example, if you are given the word "POODLE", you might write down "DOGS" or even "ANIMALS", as a poodle is an example of both a dog and an animal. Be creative in your answer, and try to come up with the most general category for which the provided word is an example.

### Exemplar (Concrete) Instructions

In this task, you will be provided with a series of categories. Your task will be to write down a word that is an example of the given category. That is, ask yourself the question "An example of [provided category] is what?" and write down the answer that you come up with.

For example, if you are given the word "DOG", you might write down "POODLE" or even "PLUTO" (the Disney character). Be creative in your answer, and try to come up with the most specific example of the provided category as you can.

### Items

1. Soda
2. Newspaper
3. Pasta
4. Book
5. Sport
6. Table
7. Shoe
8. Movie
9. Pen
10. Lunch

11. Train
12. Actor
13. Beer
14. Phone
15. Soap
16. Fruit
17. Coin
18. Restaurant
19. Game
20. College
21. Candy
22. Soap opera

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