THE MOTIVATIONAL CONSEQUENCES OF
UPWARD SOCIAL COMPARISONS

DISSERTATION

Presented in Partial Fulfillment of the Requirements
for the Degree Doctor of Philosophy
in the Graduate School of The Ohio State University

By
Camille S. Johnson, M.A.

*****

The Ohio State University
2005

Dissertation Committee:                         Approved by
Dr. Robert M. Arkin, Adviser
Dr. Marilynn Brewer
Dr. Richard E. Petty

__________________________________________       Adviser
Psychology Graduate Program
ABSTRACT

The studies presented meet two goals. First, the current research demonstrated a link between engaging in social comparison and increasing awareness of self-discrepancies. Second, the current research examined the behavioral consequences of the increased awareness of self-discrepancies as means of explaining previous research findings.

Upward social comparison has been found to lead to improved performance under certain conditions. For example, when individuals believe that the accomplishments of a more successful other are unattainable, they tend to perform better on subsequent performance tasks. One explanation for this effect is that unattainable comparison targets threaten self-evaluations and increasing achievement is one means of restoring those self-evaluations. The dissertation argues that increases in performance following social comparison also arise because social comparison increases the accessibility of self-discrepancies within individuals. That is, following comparison with a more successful other, individuals are more aware of the discrepancy between their current selves and their ideal selves. This increased awareness is associated with promotion-focused goal pursuit and better performance on certain tasks. Thus, I argue that the increases in performance following exposure to threatening social comparison targets that have been
found in previous research may be the result of participants adopting a promotion focus and engaging the promotion focused goal pursuit strategies.

Three studies are reported here. The first study tested the proposition that comparing oneself to a more successful other, whose accomplishments are viewed as unattainable, will activate and increase accessibility of ideal self-guides and actual-ideal self-discrepancies. Participants read about an older (attainable) or younger (unattainable) university student who had recently won an award. Those who read about the unattainable other had greater accessibility of actual-ideal discrepancies and adopted a regulatory focus that was oriented towards promoting positive rather than avoiding negative outcomes.

The second study tested the assertion that unattainable comparison targets influence the performance strategies used to complete tasks. Because promotion focus is associated with riskier, faster performances, unattainable comparison targets were expected to be less accurate and faster in completing a word selection task. Again, participants read about an older (attainable) or younger (unattainable) university student. Results showed that exposure to unattainable comparison targets led participants to have a higher ratio of incorrect to correct answers, suggesting lowered accuracy rates.

Finally, the third study examined how other threatening, aspiration-relevant comparison targets may have similar effects on performance as unattainable comparison targets. Because promotion focus is related to better performance on creative tasks and threatening social comparisons lead to promotion focus, participants exposed to threatening social comparisons were expected to perform better on creative tasks than on analytic tasks. Participants read about university students who had won an award for
abilities related to the participants’ majors (relevant) or unrelated to the participants majors (irrelevant). Then participants completed tasks requiring analytic and creative ability. Those for whom the task was unrelated to the comparison target’s domain of success, but for whom the task was personally relevant, performed best on the creativity task. On the analytic task, those for whom the task was related to the comparison target’s domain of success, but for whom the task was personally irrelevant, performed best.
ACKNOWLEDGMENTS

I am honored to have spent the last six years in the company of the members of the Ohio State social psychology program. Nowhere is there a group of people more collegial, more dedicated, and more supportive. I thank all the faculty and students who have passed through the doors of Lazenby Hall over the past six years for their advice, support, and inspiration. Dr. Robert Arkin, my adviser, must also be thanked. His humor and penchant theoretical musings taught me to look beyond $p$ values and individual studies and to question the greater meaning of every finding. I must also express my deep gratitude and admiration for Dr. Marilynn Brewer, my own unattainable role model. Fear of receiving the “look” when I did not meet her standards, combined with her warm nature pushed me to work harder and more carefully. I am also grateful to Marilynn and Dr. Rich Petty for their generosity in agreeing to serve on my committee.

Of course, the members of Arkin Lab, in particular, Jessica Lakin, Tony Hermann, Geoffrey Leonardelli, Kim Sauser, Tiffany Hardy, and Lana Rucks, deserve great thanks and credit. Being able to share laughter, frustration, and successes with them made the hard times bearable and the good times more glorious. In particular, I could never have completed my fifth year without Kim and Lana’s assistance. Thanks
also Greg Norman, a tireless undergraduate research assistant. His dedication and
diligence were of immeasurable value to this project.

Two other individuals also deserve my appreciation: Dr. Diederik Stapel and Dr. Dana Carney. Diederik collaborated with an unknown third-year student who literally showed up on his doorstep. Through his enthusiasm and singularly Dutch way of expressing himself, I have learned about myself as a writer and a scientist. Dana has been a cheerleader and sounding board and my go-to support staff. When in doubt, I could always turn to her to raise my spirits or share my success.

Finally, I must thank my family. Anyone who has met them knows that I am a product of their unique personalities. I thank my mother, Flora Johnson, for her high expectations. From the time I was a child, she spoke of when I would earn my graduate degree, not if. She provided me with skills and confidence to achieve my greatest goals. I thank my father, Victor Johnson, for my quick mind and faster tongue. His ability to talk to anyone and his curiosity about the world may be what led me to social psychology in the first place. Last but not least, I must thank the two most important men in my life, my two MJs: Menko and Mattheus Johnson. Menko has supported me since I was 17 years old, physically, emotionally, and more recently, financially. Without him in my life, I could not have completed this project or any project during the last decade. And Mattheus, my Matty. He has brought balance, joy, and greater meaning to my life. May this work, and all my work, serve to make this world a better place for him.
VITA

May 24, 1973  Born, Lexington, KY

1994 ................................................. B.A. Psychology, Carleton College

1996-1999 ........................................... Research Associate,
                                               Henry R. Kravis Leadership Institute
                                               Claremont McKenna College

1999 ................................................. M.A. Psychology
                                               Claremont Graduate University

2001-2002 ........................................... NIMH Training Grant Recipient

2002-2004 ........................................... NIH National Research Service Award Recipient

2004-2005 ........................................... Teaching Associate
                                               Department of Psychology
                                               The Ohio State University

FIELDS OF STUDY

Major Field:  Psychology

Minor Field:  Social Psychology

Quantitative Psychology

Political Psychology
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>ii</td>
</tr>
<tr>
<td>Acknowledgements</td>
<td>v</td>
</tr>
<tr>
<td>Vita</td>
<td>vii</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xii</td>
</tr>
<tr>
<td>List of Figures</td>
<td>xiii</td>
</tr>
<tr>
<td>Chapters:</td>
<td></td>
</tr>
<tr>
<td>1. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>Upward Social Comparisons and Self-Evaluations</td>
<td>1</td>
</tr>
<tr>
<td>Social comparison, attainability, and self-evaluation</td>
<td>2</td>
</tr>
<tr>
<td>Upward Social Comparisons and Performance</td>
<td>4</td>
</tr>
<tr>
<td>Social comparisons, attainability, and performance</td>
<td>5</td>
</tr>
<tr>
<td>Inspiration hypothesis</td>
<td>5</td>
</tr>
<tr>
<td>Threat hypothesis</td>
<td>5</td>
</tr>
<tr>
<td>Testing the Threat Hypothesis</td>
<td>7</td>
</tr>
<tr>
<td>Manipulated attainability and performance</td>
<td>7</td>
</tr>
<tr>
<td>Perceived attainability and performance</td>
<td>7</td>
</tr>
<tr>
<td>Self-evaluation maintenance and performance</td>
<td>8</td>
</tr>
<tr>
<td>Social Comparison and Motivation</td>
<td>11</td>
</tr>
<tr>
<td>Self-Discrepancy Theory</td>
<td>12</td>
</tr>
<tr>
<td>Discrepant self-aspects</td>
<td>12</td>
</tr>
<tr>
<td>Regulatory focus</td>
<td>14</td>
</tr>
<tr>
<td>Regulatory focus and goal pursuit strategies</td>
<td>14</td>
</tr>
<tr>
<td>Vigilant-avoid strategies</td>
<td>14</td>
</tr>
<tr>
<td>Eager-approach strategies</td>
<td>15</td>
</tr>
<tr>
<td>Regulatory focus and creativity</td>
<td>16</td>
</tr>
<tr>
<td>Social comparison and self-discrepancies</td>
<td>16</td>
</tr>
<tr>
<td>Threatening comparisons and promotion focus</td>
<td>17</td>
</tr>
</tbody>
</table>
Overview of Current Studies ..................................................................................... 19

2. Experiment 1: Measuring Self-Discrepancies ............................................................ 24
   Overview.................................................................................................................... 24
   Method....................................................................................................................... 25
      Participants....................................................................................................... 25
      Design .............................................................................................................. 25
      Materials and Independent Variables............................................................... 25
         Comparison targets...................................................................................... 25
         Self-guide measures .................................................................................... 26
         Regulatory focus measure ........................................................................... 28
      Procedure ......................................................................................................... 28
   Results........................................................................................................................ 29
      Data preparation............................................................................................... 29
      Self-guide accessibility.................................................................................... 30
         Calculating self-guide strength.................................................................... 30
         Strength of self-guides. ................................................................................. 30
         Ideal self-guides. ........................................................................................... 31
         Ought self-guides ........................................................................................... 32
      Relative strength of self-guides ....................................................................... 32
      Self-discrepancy accessibility .......................................................................... 33
         Calculating accessibility of discrepancies................................................... 33
      Accessibility of self-discrepancies .............................................................. 34
      Actual-Ideal Discrepancies ......................................................................... 35
      Actual-Ought Discrepancies ........................................................................ 36
      Relative accessibility of self-discrepancies ................................................. 36
      Extent of Self-Discrepancies ............................................................................ 37
      Difference score analysis ............................................................................ 38
      Extent analysis............................................................................................. 38
      Regulatory Focus ............................................................................................. 38
      Participant Feelings of Inspiration and Demoralization............................... 40
      Participant Aspirations..................................................................................... 41
      Relations between Dependent Variables......................................................... 41
   Discussion.................................................................................................................. 42
      Increased Accessibility of Ideal Self-Guides and Increased Promotion Focus 42
      Activating Self-Discrepancies.......................................................................... 42
      Enhancing and Minimizing Discrepancies....................................................... 43

3. Experiment 2: Social Comparison and Speed and Accuracy of Performance............ 46
   Overview.................................................................................................................... 46
   Method....................................................................................................................... 47
      Participants....................................................................................................... 47
      Design .............................................................................................................. 47
Materials........................................................................................................... 47
Comparison targets.......................................................................................... 47
Regulatory focus measure .............................................................................. 47
Performance measure .................................................................................... 48
Procedure ......................................................................................................... 48
Results................................................................................................................ 49
Accuracy of Performance.................................................................................. 50
Speed of performance ....................................................................................... 51
Other Dependent Variables ............................................................................ 51
  Regulatory Focus Scale ................................................................................. 52
  Participant Perceptions of Task ................................................................. 52
  Participant Perceptions of Performance .................................................... 52
  Participant Strategies .................................................................................... 52
Discussion.......................................................................................................... 52

4. Experiment 3: Social Comparison and Creative and Analytic Tasks............ 56
Overview.......................................................................................................... 57
Method.............................................................................................................. 58
  Participants .................................................................................................... 58
  Design ............................................................................................................ 59
  Materials ....................................................................................................... 59
    Comparison targets .................................................................................... 59
    Performance measures ............................................................................. 60
    Creativity Task ........................................................................................ 60
    Analytic Task ............................................................................................ 61
Procedure ......................................................................................................... 61
Results and Discussion .................................................................................... 62
  Coding of conditions ................................................................................... 62
  Performance measures ................................................................................. 62
    The importance of performance domain ................................................. 64
    Performance on analytic task ................................................................. 67
    Performance on creativity task ............................................................... 69
  Testing Regulatory Focus ............................................................................ 70
  Perceptions of task ....................................................................................... 70
  Perceptions of targets .................................................................................. 72
Conclusions Study 3 ....................................................................................... 73
  When does regulatory focus apply? ............................................................ 73
  When other motivations take precedence .................................................. 74
  Limitations .................................................................................................. 75
  Categorizing Majors .................................................................................... 75

5. Conclusion: Review and Implications ........................................................ 76
Summary of results ........................................................................................... 76
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Accessibility of self-discrepancies</td>
<td>37</td>
</tr>
<tr>
<td>2.2 Means and standard deviations of regulatory focus</td>
<td>40</td>
</tr>
<tr>
<td>4.1 Participant perceptions of analytic and creative tasks</td>
<td>72</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 2.1</td>
<td>Strength of self-guides by type of comparison target</td>
<td>32</td>
</tr>
<tr>
<td>Figure 2.2</td>
<td>Accessibility of self-discrepancies by type of comparison target</td>
<td>35</td>
</tr>
<tr>
<td>Figure 3.1</td>
<td>Ratio of incorrect to correct answers by type of comparison target</td>
<td>51</td>
</tr>
<tr>
<td>Figure 4.1</td>
<td>Effect of relevant and irrelevant comparison targets on analytic and creative task performance</td>
<td>63</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>Performance on analytic and creativity task by participant major and comparison target domain of success</td>
<td>66</td>
</tr>
<tr>
<td>Figure 4.3</td>
<td>Performance on analytic task by participant major and type of comparison target</td>
<td>67</td>
</tr>
<tr>
<td>Figure 4.4</td>
<td>Performance on creativity task by participant major and type of comparison target</td>
<td>68</td>
</tr>
</tbody>
</table>
CHAPTER 1

INTRODUCTION

Daily life is filled with social interactions. Whether these interactions are formal or casual, they are meaningful because they provide us with knowledge about ourselves. This is the premise of social comparison theory (Festinger, 1954). According to social comparison theory, when objective standards are unavailable, individuals compare themselves to others in order to evaluate their abilities and opinions. In application, social comparison theory suggests that how we perform on a test or how much we can lift is most meaningful when we know how we did compared to similar others. If similar others have scored fewer points or cannot lift as much weight, then we have done relatively well and may consider ourselves intelligent and strong. Conversely, if others perform better than we do, then we have done relatively poorly and may consider ourselves unintelligent and weak. Thus, we define ourselves and our abilities in relation to others.

Upward Social Comparisons and Self-Evaluations

Comparisons with more successful or stronger others constitute upward comparisons (Wood, 1989). While one might imagine that any situation in which one is
outperformed by another would have negative consequences for self-regard, this is not always true. In fact, the consequences of upward comparison vary in valence and type. For instance, Lockwood and Kunda (1997) found that under some conditions, upward comparisons can lead to inspiration.

Social comparison, attainability, and self-evaluation. Lockwood and Kunda (1997) found that the perceived attainability of the accomplishments of a more successful role model determined how individuals reacted to that role model. In their studies, attainable role models were described as upward comparison targets whose success participants felt they could emulate.

In two of the studies, the age of the role models relative to the age of the participants was used to create attainability. Attainable role models were described as older than the participants, while unattainable role models were described as being the same age as participants. The accomplishments of same-aged successful others were considered unattainable because participants could not map their futures on to those of the role model. In contrast, participants could foresee themselves matching the accomplishments of the older successful other in the future, which implied that these accomplishments were attainable. Lockwood and Kunda (1997) found that when participants read about an attainable (older) role model, they reported higher self-evaluations and feelings of inspiration. When they read about an unattainable (younger) role model, they reported relatively lower self-evaluations and feelings of demoralization.

In addition to demonstrating that characteristics of the role models could affect perceptions of attainability and affect self-evaluations, Lockwood and Kunda (1997) also
found that characteristics of the participants influenced their responses to role models. Drawing on the distinction made between entity and incremental theories of intelligence (Dweck & Legget, 1988), they found that participants’ general views of the likelihood of increasing levels of achievement influenced how they responded to role models. Holding an entity theory of intelligence is associated with the belief that levels of intelligence are unchanging and unalterable. Holding incremental theory of intelligence is associated with the belief that levels of intelligence are changing and alterable. Because individuals holding an entity theory believe that intelligence is unchangeable, entity theorists are less likely to view the accomplishments of others as attainable as are those holding an incremental theorists. In fact, Lockwood and Kunda (1997) found that incremental theorists reported boosted self-evaluations and inspiration after reading about a role model, whereas entity theorists reported demoralization.

In short, under some conditions, upward comparisons benefit self-evaluations. If an upward comparison target is more senior in age, or if the perceiver is an incremental theorist (Dweck & Legget, 1988), the accomplishments of the comparison target may be seen as attainable by the perceiver. In this case, upward comparison benefits self-evaluations and leads to inspiration. In contrast, if an upward comparison target is younger or of the same age, or if the perceiver is an entity theorist, the accomplishments of the comparison target may be seen as unattainable by the perceiver. This situation results in upward comparisons that harm self-evaluations and lead to demoralization.
Upward Social Comparisons and Performance

In addition to affecting self-evaluations, upward comparisons have also been found to influence performance outcomes in a variety of domains. For example, Marx and Roman (2002) found that women performed better when administered a difficult mathematics exam by a female experimenter, who was described as possessing high math ability, than when the exam was administered by a comparable male experimenter. Similarly, Seta, Seta, & Donaldson (1991) found that on low value tasks, the presence of more successful coactors led to better performance outcomes than working alone.

However, not all studies of upward comparison have found benefits for performance. Dijksterhuis et al., (1998) offers a salient example. They found that when participants were exposed to an intelligent other (Einstein), participants performed worse on an intelligence task than when exposed to an unintelligent other (Claudia Schiffer) or when exposed to the stereotype of professors. Thus, exposure to someone perceived to be more intelligent led to worse performance than exposure to someone perceived to be less intelligent.

In sum, previous research has shown that upward social comparison may have beneficial or detrimental effects on self-evaluations and performance. While target attainability determines whether upward comparisons positively or negatively affect self-evaluations (Lockwood & Kunda, 1997), no such moderator was identified to explain why performance responses vary with the experimental context (Dijksterhuis et al., 1997; Marx & Roman, 2003; Seta et al., 1991). Recently, however, research has suggested that target attainability may be a moderating factor – that an individual’s perception of the
attainability of a comparison other’s accomplishments may determine behavioral
responses (Johnson et al., 2004; Johnson & Stapel, 2005, 2005a, 2005b).

Social comparisons, attainability, and performance. Just as upward social
comparisons can either positive or negatively influence self-evaluations, those same
comparisons may positively or negatively influence performance. Given that attainability
moderates the relation between upward comparisons and self-evaluations, it seemed
likely that attainability should similarly moderate the relation between comparisons and
performance. It is less clear, however, whether attainable or unattainable comparison
targets will lead to improved performances. In fact, two different predictions may be
made.

Inspiration hypothesis. One might assume that because greater attainability is
associated with higher self-evaluations and feelings of inspiration (Lockwood & Kunda,
1997), greater attainability should also be associated with better performance. This is the
intuitive “inspiration” hypothesis. Drawing on the general assumption that higher self-
evaluations are associated with higher levels of performance, the inspiration hypothesis
argues that the comparison targets that boost self-evaluations should also boost
performance outcomes.

Threat hypothesis. However, one could conceive of situations in which
attainability would be negatively correlated with performance. This is the argument of
the “threat” hypothesis. Drawing on the assumption that comparison with unattainable
targets lead to discomfort, which individuals are motivated to alleviate through enhanced
performance, this hypothesis argues that comparison targets that threaten self-evaluations

should boost performance outcomes. For example, imagine you are exposed to a more successful other and you feel that you are likely to attain similar levels of accomplishments as the successful other. In response to this comparison, your self-evaluations may be bolstered and you may even experience some of the emotions associated with success by affiliaing with the successful other. Unfortunately, these raised self-evaluations and positive emotions do not elicit a need or desire to improve performance (Oettingen & Mayer, 2003). Ultimately, while the more successful other improves your self-evaluation, she may undermine your performance by eliciting complacency. On the other hand, imagine that you are exposed to a more successful other and you feel that you are unlikely to attain similar levels of accomplishment. In this case, your self-evaluations are threatened and you may be motivated to protect or repair your self-evaluations.

When an individual’s self-evaluations are threatened, a number of coping strategies may be employed. The self-evaluation maintenance model describes these strategies (SEM; Tesser, 1988). One response is to devalue the domain in which they were outperformed. Having been surpassed by a comparison target in a particular domain, individuals may withdraw from that domain and thereby avoid future negative comparisons. Alternatively, an individual may excel in a different domain and create a situation in which a positive comparison with that target would be likely. For example, if one is outperformed by a friend on a math task, one may compensate by working hard on a verbal task in hopes of surpassing that friend. Thus, a successful other may initially
damage your self-evaluations, but may ultimately benefit your performance in other domains.

Testing the Threat Hypothesis

To examine the effects of comparison targets on performance, a series of studies manipulating perceived attainability and measuring performance were recently conducted, which examined the effect of comparison targets on performance.

Manipulated attainability and performance. In an initial investigation, Johnson et al., (2004) asked first-year students to read about a fellow university student who had recently won a scholarship. Age of the comparison target relative to the participant was used to manipulate attainability (Lockwood and Kunda, 1997) and the university student was described as either older (attainable) or younger (unattainable). Under the guise of a separate study, participants then completed a measure of “integrative orientation,” a 20-item Remote Associates Task (RAT; Mednick & Mednick,1967). On the RAT, participants were presented with three words (e.g., “cake” “butter” and “coffee) and asked to generate a fourth word that was related to all three words (e.g., “cup”). As predicted by the threat hypothesis, attainability and performance were negatively correlated. When participants read about the older student, they completed fewer items correctly than when they read about the younger student or read about a university construction project (Johnson et al, 2004). Thus, unattainable comparison targets were related to better performance than attainable comparison targets.

Perceived attainability and performance. In a second set of studies, Johnson and Stapel (2005c) measured participant perceptions of attainability and examined
performance. Participants were asked to read about either a moderately or extremely successful university student. In the moderately successful condition the comparison target was in the top 20% of his class and in the extremely successful condition the comparison target was in the top 5% of his class. After reading about the comparison target, participants completed a 20-item RAT, a measure of self-evaluation, and rated how attainable they felt the comparison target to be. As expected, extreme comparison targets led to lowered self-evaluations relative to moderate comparison targets and a control condition. Additionally, participants completed more items correctly following exposure to the extreme comparison target than following the moderate comparison target or in the control condition. As predicted by the threat hypothesis, target attainability and participant self-evaluations were negatively correlated with performance. The less attainable participants perceived the targets to be, the lower the participant self-evaluations, and the better participants performed. These findings supported the threat hypothesis and suggested that comparison targets that threaten self-evaluations may have the most beneficial effects on performance.

*Self-evaluation maintenance and performance.* Finally, a third set of studies was conducted looking specifically for self-evaluation maintenance behaviors (Johnson & Stapel, 2005). Drawing from the SEM literature, it was predicted that because unattainable comparison targets were a source of self-evaluation threat, individuals should respond to those targets by employing strategies described by the SEM. It was expected that exposure to unattainable comparison targets would lead to strategic domain withdrawal and engagement. That is, it was expected that exposure to unattainable
comparison targets would lead to improved performance in domains mismatching the
target’s domain of success, but not in domains matching the target’s domain of success.

In the first study (Johnson & Stapel, 2005), the domain of role model success
either matched or mismatched the domain of the performance task. The success of a role
model was described as either verbal or mathematical in nature while the performance
task was always described as a measure of verbal ability. When faced with a comparison
target who had been successful in a verbal arena, participants were expected to withdraw
from the matching verbal performance task, resulting in poorer performance.
Conversely, when faced with a comparison target who had been successful in a
mathematics arena, participants were expected to increase engagement in the
mismatching verbal performance task resulting in better performance. That is, when the
domains mismatched, performance improvements were expected and when the domains
matched, differences in performance were not expected.

As in earlier studies, participants read about an attainable or unattainable role
model and, as part of what they believed to be a separate study, completed a version of
the RAT. As predicted, when the domain of the role model’s success and the test
matched, role model attainability did not affect performance. Participants exposed to the
unattainable and attainable role models performed equally well. However, when the
domain of the role model and the test domain did not match, unattainable role models led
to better performance than attainable. Thus, participants appeared to be responding to the
matching and mismatching of the domains in a manner congruent with predictions made
by the self-evaluation maintenance model. This supports the proposition that participants’
better performance was a response to self-evaluation threat.

A second study further tested this proposition (Johnson & Stapel, 2005). In this
study, the success of the role model was described in general or specific terms, while the
test was always described in specific terms. The previous study featured a strict
match/mismatch design, in which the role model and performance domains were
narrowly defined. In the second study, the domains were described as either completely
matching or as overlapping. In the completely matching conditions, the target’s domain
of success was the same as the task domain. In the overlapping condition, the target’s
domain of success encompassed the task domain. The target’s success was attributed to
global abilities including those measured by the performance task but also because of
many other abilities. As previously found, when the two domains matched, role model
attainability did not affect performance. When the role model domain included the
performance domain in a global sense, unattainable role models led to better performance
than did attainable. Thus, participants were responding to unattainable comparison
targets in the same way that others have responded to other self-evaluation threats.
Again, these results suggested that threats to self-evaluations play a role in increasing
performance following exposure to an unattainable role model.

In sum, researchers have found that upward comparison may lead to bolstered or
lowered self-evaluations (Lockwood & Kunda, 1997; Johnson & Stapel, 2005c) and
improved or damaged performance (Marx & Roman, 2002; Seta et al., 1991). Factors
determining how individuals respond include the perceived attainability of the target’s
accomplishments and the threat posed by the target to individuals. When targets are unattainable and threaten self-evaluations, comparison yields higher performance, yet lowered self-evaluations. When targets are attainable, comparison yields lower performance and raised self-evaluations (Johnson et al., 2004; Johnson & Stapel, 2005, 2005a, 2005c).

Social Comparison and Motivation

While previous research has demonstrated that threat to self-evaluations follow upward social comparisons and increase performance, it is unlikely that threat alone accounts for performance increases. That is, the impact of social comparisons on an individual are not limited to threatened self-evaluations. In addition to threatening self-evaluations, social comparisons may have direct effects of performance motivations. Performance differences following comparison to attainable and unattainable comparison targets may be the result of differences in motivation to achieve that are unrelated to decreases in self-evaluations. In particular, I argue that comparisons with more successful others may be motivating, not only because discrepancies between the self and the other are highlighted, but also because discrepancies between one’s current self and one’s desired selves are highlighted. Thus, upward comparison targets, particularly those with attainable achievements, may influence performance not only because they threaten our self-evaluations, but also because they remind us of how far we are from who or where we want to be. This discrepancy, between current and desired states, may create motivation to achieve (Carver & Schier, 1998; Higgins, 1987).
The presence of a difference or discrepancy between current status and desired status is the basic component of many models of goal pursuit (Carver & Schier, 1998; Higgins, 1987; Oettingen, Pak, & Schnetter, 2001). Comparing oneself with similar, but more successful others, may make this information accessible (Stapel & Tesser, 2001). For instance, if you are an average student, but aspire to be an excellent student, comparison with the class valedictorian may not only highlight differences between you and her, but also between you and your desired self. Thus, the very act of social comparison may imply a motivational response – it highlights the difference between one’s current status and desired status.

Self-discrepancy Theory

Discrepant self-aspects. Self-discrepancy theory (Higgins, 1987) suggests that it is not only the differences between current status and desired status that determines motivation, but also the nature of that desired status. Self-discrepancy theory distinguishes between three different self-aspects: the actual self, the ideal self, and the ought self. The actual self consists of one’s estimation of the self at the current time. The ideal self consists of what one wishes one could be. The ought self consists of what one thinks others think one should be. Ought and ideal selves may serve as self-guides and individuals may differ as to which self-guides they are motivated to meet. Stronger self-guides have a stronger influence on the type of goals that an individual pursues. However, self-guides are not sources of motivation by themselves. The discrepancy between self-aspects is the source of motivation. In particular, the discrepancies between actual selves and ideal and ought selves are motivating. Those discrepancies represent
mismatches between current states and desired end states, which individuals are motivated to eliminate (Carver & Scheier, 1981).

A number of factors determine the degree to which self-discrepancies influence motivation. The first factor is the availability of discrepancy. The greater the difference there is between the actual self and the ideal or ought self, or the extent or magnitude of the discrepancy, the more available the discrepancy. When that discrepancy is activated, the resulting motivation will be more intense. For example, if individuals have a large discrepancy between who they think they are now and who they believe they should be, they have an actual-ought discrepancy. If they are made aware of this discrepancy or this discrepancy becomes activated, the resulting motivation to reduce the discrepancy should be more intense. Therefore, if comparisons with more successful others leads individuals to raise their standards or view their accomplishments less favorably, the magnitude of self-discrepancies may be increased and the resulting motivation to meet those standards could be stronger.

A second factor affecting the motivation produced by self-discrepancies is accessibility of the discrepancy. Like any cognition, accessibility of self-discrepancies increases with recency and frequency of access and with applicability to a particular situation (Higgins, 1997). The more accessible a discrepancy, the greater the likelihood that individuals will feel motivated to reduce that discrepancy. Thus, if social comparisons increase accessibility of self-discrepancies, they increase the likelihood that individuals will feel motivated to meet ideal or ought standards.
Regulatory focus. The type of discrepancy also influences the motivational orientations experienced by individuals (Higgins, 1997). Self-discrepancy theory distinguishes between two types of regulatory focus: promotion and prevention. Promotion focus is associated with a concern for attaining ideal selves. Individuals who are promotion focused are more sensitive to the presence of positive information and actively seek to attain the ideal self. Attainment of these goals is accompanied by the feelings of satisfaction, joy, and elation. In contrast, prevention focus is associated with a concern with attaining the ought self. Individuals who are prevention focused are more sensitive to the presence of negative information and focus on minimizing the chances of not attaining the ought self. Attainment of these goals is accompanied by feelings of quiescence and relaxation (Brockner & Higgins, 2001).

Regulatory focus and goal pursuit strategies. Regulatory foci are associated with the selection of different goal pursuit strategies (Friedman & Forster, 2001). Prevention focus is related to engagement of vigilant-avoid strategies for goal-pursuit while promotion focus is related to engagement of eager-approach strategies for goal pursuit. Each of these strategies is adaptive and beneficial for different types of tasks (Friedman & Forster, 2001).

Vigilant-avoid strategies. Individuals with a prevention focus have been shown to recall avoidance information and to employ vigilant-avoid strategies (Higgins, Roney, Crowe, & Hymes, 1994). For example, when presented with a story about the life of a typical student, participants with a prevention focus are more likely to recall examples of avoidance behavior while participants with a promotion focus are more likely to recall
examples of approach behavior (Higgins et al., 1994). Similarly, when participants are given an opportunity to complete a task, those with a prevention focus employ more conservative strategies. These strategies reflect their motivation to ensure safety and avoid losses.

On tasks, vigilant-avoid strategies lead to greater accuracy, but reduced speed. Individuals with a prevention focus are concerned with avoiding mistakes, which may increase their accuracy. However, increased caution may also reduce the speed with which they complete tasks (Friedman & Forster, 2001). When placed in a testing situation, a prevention focus person may concentrate on solving the most possible problems correctly. As a result, he may solve fewer problems overall, but make fewer errors.

In the context of social comparison, if comparison targets remind individuals of goals they should accomplish, individuals may complete goal-related tasks using more conservative strategies. For example, on a task such as the RAT, participants may provide fewer answers or spend more time on the task as a means of maximizing the number of correct answers.

*Eager-approach strategies.* Individuals with a promotion focus have been shown to recall approach information and to employ eager-approach strategies (Higgins, Roney, Crowe, & Hymes, 1994). They also employ riskier strategies that reflect their motivation to ensure hits and avoid errors of omission. They are more concerned with not missing opportunities to achieve which may decrease their accuracy, but may increase the speed with which they complete a task (Friedman & Forster, 2001). When placed in a testing
situation, that person may focus on solving the most possible problems as opposed to avoiding giving wrong answers. As a result, she may give more answers overall, but may provide fewer correct answers.

In the context of social comparison, if comparison targets remind individuals of goals they want to accomplish, individuals may complete goal-related tasks using riskier strategies. For example, on a task such as the RAT, participants may provide more answers or go more quickly through the task as a means of maximizing the number of correct answers in the time allotted.

*Regulatory focus and creativity.* In addition to affecting speed and accuracy of performance, goal pursuit strategies are also associated with different levels of performance on creative versus analytic tasks. The risky, eager-approach style associated with promotion focus lends itself to better outcomes on creative tasks (Friedman & Forster, 2001). In one study, when participants were prompted to adopt a promotion focus, they performed better on generative, creative tasks such as naming novel uses for a brick. Conversely, the conservative, vigilant-avoid style associated with prevention focus led to better outcomes on analytic tasks such as solving problems from the Graduate Record Exam.

Social comparison and self-discrepancies

A direct relationship between self-discrepancies and social comparison has not previously been demonstrated. However, several recent studies have provided indirect evidence and demonstrated a relationship between downward social comparison and regulatory foci. When individuals felt similar to and vulnerable to the same fate as a
downward comparison other, they show increased prevention focus (Lockwood, 2002). In one set of studies, university students were asked to reflect on how they might suffer the same fate as a contemporary or older student. When participants reflected on the older student, to whose fate they were much more vulnerable, they showed an increase in prevention focus. Similarly, other research has shown that chronic regulatory focus interacts with the type of comparison target individuals prefer (Lockwood, Jordan, & Kunda, 2002). In these studies, participants with a chronic promotion focus preferred upward comparison targets, while participants with a chronic prevention focus preferred downward comparison targets.

In addition to predicting that social comparisons increase accessibility of self-discrepancies, the model presented here makes specific predictions regarding the nature of discrepancies activated. Specifically, upward comparisons with self-evaluation threatening social comparison targets are hypothesized to increase accessibility of ideal – actual discrepancies. This relationship between comparisons and self-discrepancies is expected for several reasons.

_Threatening comparisons and promotion focus_. Exposure to a more successful other may affect the accessibility of self-discrepancies because the accessibility of any discrepancy increases with the recency of access. Engaging in social comparison activates the current self (Stapel & Tesser, 2001), and it is suggested here, activates the ideal self. Ideal selves, and not ought selves, are hypothesized to be activated because a threatening comparison target is someone who outperforms us in a relevant domain and whose accomplishments are relevant to our own aspirations. As such, they may represent
alternative versions of the current self and remind us of our ideal selves. Because they are related to our aspirations, and not to our obligations, they are more likely to remind of us of ideal-selves.

The existence of a relationship between threatening social comparisons and ideal-self activation is suggested by previous research. In her studies of downward comparison, Lockwood (2002) found that when participants felt similar to and vulnerable to the same fate as a comparison target, they were more prevention focused. In other words, when the fate of the comparison target was attainable, participants felt more prevention focused and when the fate of the comparison target was unattainable, participants felt more promotion focused. Thus, unattainable upward comparison targets, which create self-evaluation threat, should also be related to greater promotion focus. And, greater promotion focus is related to ideal self-guide activation.

Additionally, the recent Reflection and Evaluation Model (REM, Markman & McMullen, 2003) theorizes that exposure to upward comparisons targets, which is equated with generating in upward counterfactuals, should lead to increased promotion focus. According to this model, upward comparisons lead to negative affect which may be resolved through performance on an achievement task.

Second, social comparison is expected to affect self-discrepancies because exposure to a more successful other may alter the standards to which individuals aspire. Lockwood and Kunda (1999) found that successful others could affect aspirations. In their studies, when participants were asked to describe their best selves, and then were exposed to comparison targets that had exceeded these best selves, the participants
reported feelings of dissatisfaction and demoralization. However, when participants were exposed to the superior comparison targets first, their aspirations were elevated. Thus, aspiration-relevant comparison targets may lead individuals to set higher standards and increase the size of the discrepancy between actual and ideal selves.

Thus, comparison with relevant successful others is expected to increase the accessibility of actual-ideal self-discrepancies. The increase in accessibility is expected for two reasons: recent activation of the discrepancy and increased magnitude of discrepancy between actual and ideal self-aspects.

Overview of Current Studies

Previous research has demonstrated a robust relationship between upward social comparison and performance such that unattainable comparison targets yield performance boosts while attainable comparison targets do not (Johnson et al., 2004; Johnson & Stapel, 2005, 2005a, 2005b, 2005c). Additionally, this research has identified a number of boundary conditions of the effect: matching of the performance domain to the target’s domain of success (Johnson & Stapel, 2005); ease of the performance task (Johnson & Stapel, 2005a); previous self-evaluation buffering through self-affirmation (Johnson & Stapel, 2005b).

Previous research has supported a threat model, in which unattainable targets threaten self-evaluations, initiate self-evaluation maintenance behaviors, and subsequently increase performance. The current studies suggest that another process may similarly lead to increased performance. The model presented here, which may be called a “challenge” model, suggests that upward social comparisons not only threaten self-
evaluations by highlighting discrepancies between the self and another, but may also highlight discrepancies between the current self and one’s ideal self. Thus, exposure to an unattainable comparison target is hypothesized to increase awareness of actual-ideal discrepancies, adoption of promotion regulatory focus, engagement of eager-approach strategies, and ultimately, lead to better performance on creative tasks and faster, less accurate, performance on other tasks. Both the “threat” and “challenge” models are presented in Figure 1.1.
Figure 1.1. The Challenge and Threat Models, each characterizing how unattainable comparison targets lead to improved performance
The challenge model is not intended to replace the threat model. It is not the intention of these studies to pit one model against the other. Rather, self-discrepancies and the behavioral consequences derived from activation of those discrepancies are viewed as a parallel process, which may also account for some of the performance effects found in previous research. Notably, however, the models do differ in substantive ways. The threat model predicts that negative affect or threats to self-evaluation are the motivating force in increasing performance. Additionally, the threat model predicts that the type of task does not matter, only the relation of the task domain to the targets domain; When the domains are the same, performance increases may be expected and when the domains are different, performance increases may not be expected. In contrast, in the challenge model motivation is derived from increased accessibility of actual-ideal self-discrepancies and performance improvements are expected to be particularly evident on creative tasks.

To test the challenge model, three studies were conducted. First, the hypothesis that threatening upward comparison targets highlight self-discrepancies was tested. Second, the regulatory orientations that accompany self-discrepancies and lead to greater or lesser accuracy were examined. Finally the effects of comparison targets on performance of creative and logic tasks were examined.

Together, the three studies test the challenge model in which a personally relevant, upward comparison target leads to activation of actual-ideal self-discrepancies, which leads to the adoption of promotion focus and subsequent use of eager-approach goal pursuit strategies.
Specifically, Study 1 seeks to demonstrate that comparison targets that threaten self-evaluations and improve performance also increase accessibility of ideal-actual discrepancies. Participants were presented with unattainable and attainable comparison targets. Then, they were administered a computerized version of the selves questionnaire (Evans & Petty, 2003) and the regulatory focus scale (Lockwood, 2002). Participants exposed to the unattainable comparison targets were expected to show greater accessibility and extent of ideal-actual discrepancies, as well as greater promotion focus.

Study 2 examines the relationship between comparison target attainability and use of performance strategies. Unattainable comparison targets were expected to lead to greater promotion focus and use of eager-approach strategies, resulting in less accurate but faster performance.

Much of the previous research has focused on comparison target attainability. The current research seeks to extend the threat hypothesis to encompass a variety of threatening comparison targets. In particular, the effects of aspiration relevant upward comparison targets are of interest. Study 3 meets this goal by manipulating threat via domain of achievement. Science and humanities majors read about comparison targets whose successes were attributable to math or verbal skills. Participants completed both logic and creative tasks. Promotion focus is related to better performance on creativity tasks while prevention focus is related to better performance on logic tasks (Friedman & Forster, 2001). Relevant targets were expected to lead to promotion focus. Therefore, comparison with unattainable targets was expected to be related to better performance on a creativity task compared to a logic task.
Overview

Exposure to self-evaluation threatening comparison targets has been shown to increase performance. One explanation for this effect is that when individuals are exposed to more successful others whose successes they seek to emulate, they are reminded not only of the differences between oneself and the other, but also of the discrepancies between actual and ideal self-aspects. Study 1 tests the hypothesis that threatening upward, relevant comparison targets lead to increased accessibility of ideal-actual self-discrepancies. The increase in accessibility is expected for two reasons: increased magnitude of discrepancy between actual and ideal self-aspects and recent activation of the discrepancy.

This study replicated previous studies which have shown a relationship between comparison with a more successful, personally relevant other and increased performance (Johnson et al., 2004). As in those studies, participants read about a successful university student who was either older or younger or read about a recent university construction project. Older comparison targets were considered to be attainable and non-threatening
while younger comparison targets were unattainable and threatening. Then, a measure of self-guide strength and a measure of regulatory focus were administered. Included in the measure of self-guide strength were measures of the magnitude of discrepancies between actual, ideal, and ought selves and accessibility of the discrepancies between actual, ideal, and ought selves.

**Method**

**Participants**

Participants were 131 first and second year university students. All received partial credit towards course requirements.

**Design**

A 3-cell design (Target attainability: attainable, unattainable, control) was employed.

**Materials and Independent Variables**

*Comparison targets.* Comparison targets were described as similar to our participant pool – as OSU undergraduates, a salient and important identity dimension to our participants. All comparison targets were described as winning an academic award that was accompanied by prize money. Thus, the accomplishments of all comparison targets were relevant to the aspirations of our participant pool. Targets differed only in terms of the attainability of their achievements. Specifically, attainability was manipulated via target age. Comparison targets were described as either older than or of the same age as the participants (Lockwood & Kunda, 1997; Lockwood, 2002). Older comparison targets were considered attainable and non-threatening, because the
participants still had the opportunity to match their accomplishments – the comparison
targets provided information about redefined possibilities for the self (Tesser, 1988).
Same-age role models were unattainable and threatening, because participants no longer
had the opportunity to match their accomplishments.

Information about the targets was embedded in a press release attributed to the
university. The press release stated that the scholarship had been awarded to a student
named James Marshall. The award’s criteria were described as “remarkable intellectual
achievement, superior creativity in seeking solutions to difficult problems, and
extraordinary persistence in the pursuit of the academic goals.”

In the attainable conditions, the student was described as a graduating senior, and
the press release noted that the awards were based on performance during the last two
years of college. The latter statement was included to emphasize the attainability of the
award, such that even students who had done poorly in their first quarter(s) at the
university could still win the award. In the unattainable conditions, the student was
described as an incoming first-year student, who was given the award based on his
performance during the last two years of high school. See Appendix A for the complete
press releases.

Self-guide measures. A computerized version of the Selves Questionnaire (Evans
& Petty, 2003; Higgins, Klein, & Straumann, 1985) was employed. Participants were
asked to list traits describing two types of self-representations – their “ideal self” and
their “ought self”. Their “ideal self” was defined as the person they would like to be and
that they wish or desire to be. Their “ought self” was defined as the person they believe
it is their duty or responsibility to be. Ought self and ideal self adjectives were solicited in alternating order and participants were asked not to use a given trait adjective more than once. They were also asked to list each trait adjective as quickly and accurately as they could. After listing each adjective, participants were asked to rate the extent to which that trait represented their ideal or ought self and to what extent it represented their current self. Two response times were recorded: the time it took participants to begin typing in each adjective after being prompted and the time it took participants to rate that trait as representing their ideal or ought self. These response times were summed to calculate self-guide accessibility. Faster response times indicated greater self-guide accessibility and greater self-guide strength.

Two methods of calculating extent or magnitude of self-discrepancies that have been used in previous research were used here (Higgins, Strauman & Klein; 1985; Hardin, 2002). Using the difference score method, extent of self-discrepancies were calculated by subtracting actual extent ratings from the ideal or ought extent ratings. These difference scores were summed to create ideal and ought self-discrepancy scores. Using the extent rating method, magnitude of actual-ideal self-discrepancy was calculated by summing participant ratings of the extent to which each ideal-self attribute described their current self. Extent of actual-ought self-discrepancy was calculated by summing participant ratings of the extent to which each ought-self attribute described their current self.

The measure provided an assessment of self-guide accessibility, as well as the magnitude of self-discrepancies. Self-guide strength was calculated by summing the time
it took participants to type each of the attributes and the time it took to make the self-guide extent rating. Because of positive skew in the response times, all response times were subjected to a logarithmic transformation prior to summing. Each sum was multiplied by -1 so that larger numbers represented faster response times and greater self-guide strength. To compare self-guide strength, ought self-guide response times were subtracted from ideal self-guide response times. If participants had a stronger ideal self-guide, they should have a positive score. If the participants had a stronger ought self-guide, they should have a negative score.

*Regulatory focus measure.* The regulatory focus scale (Lockwood, 2002) was also administered. The scale consisted of eight items and contained two subscales measuring promotion (cronbach’s alpha = .68) and prevention (cronbach’s alpha = .54) focus. Participant scores on each of the subscales were summed, and scores on the prevention subscale were subtracted from the promotion subcale yielding a single score in which higher numbers indicate greater promotion focus and lower numbers indicate greater prevention focus.

*Procedure*

Participants were brought to the laboratory and informed that they would be completing two different studies, both administered by computer using Media Lab. The first “study” was described as a study of media influence in which they would be reading a short paragraph and giving their impressions. It was during this phase of the experiment that they read about the comparison targets.
The second “study” was described as a survey study. Participants were told that another researcher was interested in understanding how college aged students at different universities may be the same or different in how they described themselves. Participants were asked to assist in this project by answering a series of questions as honestly as possible. Then participants received instructions for the computerized Selves Questionnaire and completed the measure (Higgins, Klein, & Straumann, 1985; Evans & Petty, 2003).

After completing the selves questionnaire, the regulatory focus scale (Lockwood, Jordan, & Kunda, 2002) was administered. Then, participants were asked to recall the paragraph they read earlier (the paragraph containing the comparison targets) and asked to rate how inspired and demoralized they were by that article. They were also asked to report the GPA they hoped to have at the end of the quarter, and the GPA they would like to have at the end of the year. These items were intended to measure participant aspirations.

Finally, participants were debriefed.

Results

Data preparation

Three participants completed the self-guide measure incorrectly and were dropped from the analysis of that measure. Prior to data analysis, the self-guide strength data were inspected for outliers in response latencies. Response latencies greater than 3.5 standard deviations from the mean were deleted from the analysis. All remaining response times were subjected to a logarithmic transformation to correct positive skew.
**Self-guide accessibility**

*Calculating self-guide strength.* The time it took to begin typing ideal attributes and the time it took to rate the extent to which those attributes represent ideal selves were summed to create a single measure of accessibility of ideal self-guides. Similarly, the time it took to begin typing ought attributes and the time it took to rate the extent to which those attributes represent ought selves were summed to create a single measure of accessibility of ought self-guides. Both measures were multiplied by –1 so that larger numbers indicated greater self-guide accessibility. The overall ought self-aspect response time was subtracted from the ideal self-aspect response time to create a single measure of self-guide accessibility and strength. Larger numbers indicated greater accessibility and strength of ideal self-guides while smaller numbers indicated greater accessibility of ought self-guides.

*Strength of self-guides.* Unattainable (younger) comparison targets were expected to increase accessibility and strength of ideal self-guides. No effects on the accessibility and strength of ought self-guides were expected. The measures of self-guide strength were subjected to a 3(type of comparison target) x [2 (type of self-guide)] within-participants ANOVA. The three way interaction was not found significant. The specific hypotheses regarding ideal self-guides were tested with a series of one way (unattainable, attainable, control) ANOVAs. First, accessibility of ideal and ought self-guides were examined separately, then the difference between the strengths of ideal and ought self-guides was examined. Figure 2.1 presents these results.
Ideal self-guides. A oneway ANOVA revealed the expected effect, although it was only marginally significant, \( F(2,106) = 2.93, p = .06 \). Orthogonal contrasts tested the specific predictions that unattainable comparison targets would lead to stronger self-guides than either the attainable comparison targets or the control condition. Participants who read about the unattainable comparison target responded faster \((M = 69.04)\) when asked to list ideal self-attributes and rate those attributes than those who read about the attainable comparison target \((M = 70.22)\), \( t(106) = -2.24, p = .03 \). Similarly, exposure to the unattainable comparison target led to greater accessibility of ideal self-guides than the control condition \((M = 70.22)\), \( t(106) = 1.88, p = .06 \).
Figure 2.1: Strength of self-guides by type of comparison target

*Ought self-guides.* Although attainable comparison targets were expected to influence accessibility of ought self-guides, a one-way ANOVA revealed no significant effects, $F(2,109) = 1.28, p = .28$.

*Relative strength of self-guides.* Following exposure to unattainable comparison targets, participants’ ideal self-guides were more accessible than following exposure to
attainable comparison targets or a no-comparison condition. This finding supports the contention that social comparison may impact self-guides. However, a more stringent test would be to compare the relative strength of ideal and ought self-guides following exposure to unattainable targets, attainable targets or a control condition. To test the relative strength of the self-guides a difference score was calculated by subtracting ought self-guide accessibility from ideal self-guide accessibility. This yielded a single score for each participant that was analyzed using a one-way ANOVA. As the pattern in Figure 2.1 suggests, there were no significant effects of condition on the relative accessibility of ideal and ought self-guides, $F < 1.0$.

**Self-discrepancy accessibility.**

*Calculating accessibility of discrepancies.* The time it took to rate the extent to which ideal attributes represented actual selves were summed to create a measure of accessibility of actual-ideal discrepancies. Similarly, the time it took to rate the extent to which ought attributes represented actual selves were summed to create a measure of accessibility of actual-ought discrepancies. On these measures, smaller numbers represented a faster response time and indicated greater accessibility of that discrepancy. Then, the accessibility of actual-ought discrepancies was subtracted from the measure of actual-ideal discrepancies to create a single measure of accessibility of self-discrepancies. On this measure, larger numbers indicated greater accessibility of actual-ideal discrepancies-guides while smaller numbers indicated greater accessibility of actual-ought discrepancies.
Accessibility of self-discrepancies. Following exposure to unattainable comparison targets, participants’ actual-ideal discrepancies were expected to be more accessible than following exposure to attainable comparison targets or a no-comparison condition. To test this hypothesis, the accessibility of actual-ideal and actual-ought discrepancies was examined separately. Then, the relative accessibility of the two types of discrepancies was examined. Figure 2.2 presents these means.
Figure 2.2 Accessibility of self-discrepancies by type of comparison target.

*Actual-Ideal Discrepancies.* An omnibus test of the effects of type of comparison target revealed a non-significant trend such that unattainable comparison targets led to greater accessibility of actual-ideal discrepancies ($M = 30.29$) than attainable ($M = 29.67$) or control conditions ($M = 29.47$), $F(2, 128) = 1.97$, $p = .14$. However, it had been specifically hypothesized that unattainable comparison targets
would lead to increases in the accessibility of actual-ideal discrepancies relative to attainable or control conditions. Therefore, planned comparisons were used to test this specific hypothesis. These analyses revealed that exposure to the unattainable comparison targets led to greater accessibility of actual-ideal discrepancies than the control condition, \( t(128) = 1.98, p = .05 \). However, no significant differences between the effects of unattainable and attainable comparison targets.

*Actual-Ought Discrepancies.* Analyses revealed no significant effects of type of comparison target on actual-ought discrepancies, \( F < 1.0 \). Since no effects were predicted, no further analyses were conducted.

*Relative accessibility of self-discrepancies.* Unattainable comparison targets were expected to lead to more accessible actual-ideal discrepancies, relative to their effect on actual-ought discrepancies. In other words, they were expected to strengthen the actual-ideal discrepancies and not affect actual-ought discrepancies. As with the previous measures, an omnibus test of the effects of comparison targets on the relative accessibility of self-discrepancies suggested only marginally significant effects, \( F(2, 128) = 2.08, p = .13 \). Again, because specific hypotheses had been generated, further analyses were conducted testing these specific hypotheses. As expected, compared to the control condition, exposure to the unattainable comparison target produced actual-ideal discrepancies that were more accessible than actual-ought discrepancies. Table 2.1 shows these means.
Table 2.1 Accessibility of self-discrepancies by type of comparison target (logarithmic transformed response times)

<table>
<thead>
<tr>
<th></th>
<th>Actual-Ideal Discrepancy</th>
<th>Actual-Ought Discrepancy</th>
<th>Difference in Accessibility (Ideal – Ought)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unattainable Target</td>
<td>30.29 (2.85)</td>
<td>28.99 (3.17)</td>
<td>1.30 (4.08)</td>
</tr>
<tr>
<td>(N = 42)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attainable Target</td>
<td>29.67 (4.39)</td>
<td>29.32 (3.79)</td>
<td>.35 (3.19)</td>
</tr>
<tr>
<td>(N = 49)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Condition</td>
<td>28.47 (5.12)</td>
<td>28.8 (4.16)</td>
<td>-.34 (3.6)</td>
</tr>
<tr>
<td>(N = 40)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Extent of Self-Discrepancies.

The extent or magnitude of a self-discrepancy is the difference between actual selves and ideal or ought selves. The further one feels from one’s ought or ideal self, the greater the extent of the discrepancy. Social comparison may impact this extent in two ways. Exposure to a non-threatening upward comparison target may lead to assimilation of one’s own self-evaluations. In that case, participants exposed to the attainable comparison target should feel closer to their ideal selves and have a smaller magnitude actual – ideal self-discrepancy. Conversely, exposure to an unattainable comparison target may lead to contrast of one’s own self-evaluations. Therefore, participants may feel that they are further from their ideal selves, leading to increases in the extent of ideal-actual discrepancies.
There are two methods of calculating the extent or magnitude of a self-discrepancy. The original technique, described by Higgins, Strauman & Klein (1986) calls for asking participants to rate the extent to which a particular attribute describes them now and the extent to which the attribute describes their ideal or actual selves. The rating of the self now is subtracted from the rating of the ideal or actual self, yielding a difference score in which larger numbers indicate a larger magnitude discrepancy. A second technique, described by Hardin (2002) asks participants to rate the extent to which each of the ideal and ought attributes describes them now on a 1 (not at all) to 5 (very much describes me) scale. The sum of these ratings for the ideal attributes serves as a measure of the magnitude of the actual-ideal self-discrepancy. The sum of the ratings for the ought attributes serves as a measure of the magnitude of the actual-ought self-discrepancy. Higher scores indicate less discrepancy while lower scores indicate a greater discrepancy. Both methods were employed in the current study.

**Difference score analysis.** Using the method described by Higgins, Strauman, & Klein (1986), the type of comparison had no significant effect on extent of self-discrepancy ratings, $F < 1.0$.

**Extent analysis.** Using the method described by Hardin (2002), the type of comparison had no significant effect on extent ratings, $F < 1.0$.

**Regulatory Focus**

In addition to self-discrepancy measures, regulatory focus measures were administered. Self-discrepancies and activation of self-discrepancies are related to the adoption of particular regulatory foci. Increased activation of actual – ideal self-
discrepancies is related to adoption of a promotion oriented regulatory focus. Increased activation of actual – ought self-discrepancies is related to adoption of a prevention oriented regulatory focus. Therefore, because exposure to unattainable comparison targets were expected to increase accessibility of actual – ideal self-discrepancies, it was also expected to increase promotion focus.

Scores on each subscale of the regulatory focus scale were calculated. Then, scores on the prevention subscale were subtracted from the scores on the promotion subscale. As a result, positive difference scores represented greater promotion motivation and negative difference scores represented greater prevention motivation.

A one-way ANOVA revealed that comparison targets significantly affect regulatory focus, $F(2, 128) = 6.98, p = .001$. As Table 2.2 reveals, no negative difference scores were found. Thus, all participants had a promotion focus. However, differences in the strength of that focus emerged and were examined with further analysis. Planned comparisons were conducted testing the specific hypothesis that unattainable comparison targets would lead to increased promotion focus and that attainable comparison targets would lead to increased prevention focus relative to the control condition. Participants reading about the unattainable comparison target had greater promotion focus than participants in the control condition ($t(128) = -3.73, p < .001$) and participants in the attainable comparison target condition, $t(128) = 1.91, p = .06$. Participants in the attainable comparison target condition were less promotion focused than participants in the control condition, although the difference was only marginally significant, $t(128) = 1.71, p = .09$. 

39
<table>
<thead>
<tr>
<th></th>
<th>Promotion Subscale Score</th>
<th>Prevention Subscale Score</th>
<th>Difference Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unattainable Target</td>
<td>28.61 (5.81)</td>
<td>21.5 (4.89)</td>
<td>7.11 (4.75)</td>
</tr>
<tr>
<td>(N = 42)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attainable Target</td>
<td>28.08 (5.61)</td>
<td>23.42 (6.33)</td>
<td>4.66 (5.41)</td>
</tr>
<tr>
<td>(N = 49)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Condition</td>
<td>29.27 (4.90)</td>
<td>22.73 (6.20)</td>
<td>6.54 (5.93)</td>
</tr>
<tr>
<td>(N = 40)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2 Mean and Standard Deviations of Regulatory Focus

*Participant Feelings of Inspiration and Demoralization*

At the conclusion of the experiment, participants were asked to recall the comparison targets and rate how inspired and demoralized they were by the stories about the targets. Because this was a temporally distant measure, coming nearly ten minutes after exposure to the comparison target and after several cognitively effortful tasks, these measures were regarded as exploratory and conclusive results were not expected. However, collecting these ratings at the end of the experiment might provide insight into the duration of the effects of comparison targets and into relationship between affective measures and other dependent variables.

One way ANOVAs revealed that the type of comparison target had no significant effects on feelings of demoralization ($F < 1.0$), but did significantly affect feelings of inspiration, $F(2, 128) = 5.61, p = .005$. Further analysis revealed that the participants in
the control condition reported less inspiration ($M = 1.98$) than participants reading about either the unattainable ($M = 2.43, t(128) = -2.09, p = .04$) or the attainable target, $M = 2.76, t(128) = -3.30, p = .001$.

**Participant Aspirations**

Participants were asked to report the grade point average (GPA) they hoped to have at the end of the quarter and at the end of the school year. These responses were included in a $3$ (type of comparison target: attainable, unattainable, control) x $2$ (GPA time: end of quarter or end of year) repeated-measures ANOVA. Although participants generally hoped to have a higher GPA at the end of the year ($M = 3.52$) than at the end of the quarter ($M = 3.48, F(1, 122) = 5.68, p = .02$), the type of comparison target did not affect either end of quarter or end of year GPA.

**Relations between Dependent Variables**

Although no specific hypotheses were generated regarding the relations between the dependent variables measured here, theoretically, scores on the regulatory focus scale and self-discrepancies should have been related. Additionally, because the challenge model suggests that inspiring others should lead to greater prevention focus, regulatory focus and inspiration should be related.

Correlational analysis revealed that scores on the promotion-prevention scale were not significantly correlated with the extent of self-discrepancies, with the accessibility of self-discrepancies nor with the accessibility of self-guides. However, scores on the promotion-prevention scale were negatively correlated with reports of
inspiration, \( r(131) = -0.17, p = .05 \). Greater promotion focus was associated with less inspiration. No other correlations were significant.

Discussion

Unattainable comparison targets have been shown to increase performance. One proposed explanation for this effect is that comparison targets that are aspiration-relevant increase accessibility of self-discrepancies and impact motivation. Study 1 tested the hypothesis that unattainable comparison targets would increase accessibility of ideal self-guides and actual-ideal self-discrepancies. Unattainable comparison targets were also expected to increase the extent of actual-ideal self-discrepancies and lead participants to adopt promotion-oriented regulatory focus.

*Increased Accessibility of Ideal Self-Guides and Increased Promotion Focus.*

As expected, unattainable comparison targets led to greater accessibility of ideal self-guides and greater accessibility of actual-ideal discrepancies. Turning to the responses on the regulatory focus scale, although all participants were more promotion than prevention focused, those who had been exposed to the unattainable comparison target were the most promotion focused while those that had been exposed to the attainable comparison target were the least promotion focused. In sum, comparison with an aspiration relevant, yet unattainable other led to greater accessibility of ideal self-guides and actual-ideal discrepancies and a greater regulatory focus on promotion.

*Activating Self-Discrepancies*

Self-discrepancies are influential when they are available. That is, only when a self-discrepancy is activated does it affect the type or magnitude of motivation (Higgins,
Self-discrepancies that are more accessible are more readily applied to situations. Thus, increased accessibility can lead to greater availability and greater motivation. Accessibility of self-discrepancies increases with the frequency and recency of activation. If an individual chronically focuses on discrepancies between the current self and the ideal self, the actual-ideal discrepancy would be more accessible. Similarly, if a particular context or individual reminds that individual of the discrepancies between the current self and the ideal self, the actual-ideal discrepancy would become more accessible.

In this study, unattainable comparison targets led to greater accessibility of actual-ideal discrepancies. This suggests that upward social comparison involves not only attention to the differences between oneself and another person but also the discrepancies between self-aspects.

The results of Study 1 are supportive of the challenge hypothesis. However, other specific hypotheses were not supported. For instance, comparison targets did not affect the extent of self-discrepancies. A second look at how social comparisons may impact self-awareness and self-discrepancies suggests that these findings are not completely incongruent with the challenge hypothesis.

Enhancing and Minimizing Discrepancies

An upward comparison target may raise one’s aspiration levels (Lockwood & Kunda, 1999). In doing so, they may call attention to one’s ideal self-guides and make those self-guides more accessible. This was the effect found. Unattainable comparison targets led to more accessible ideal self-guides than did attainable comparison targets or
the control condition. They also led to greater accessibility of actual-ideal self-discrepancies. However, unattainable comparison targets did not lead to increases in the extent of self-discrepancies.

In order for these same targets to increase the extent or magnitude of the self-discrepancies, they would have needed to decrease one’s evaluations of one’s current state or enhance or raise the level of achievement represented by ideal self-guides. Previous research suggests that the former effect is more difficult to produce using vignettes. In studies examining self-evaluations following exposure to attainable and unattainable upward comparison targets (Johnson et al, 2004; Johnson & Stapel, 2005b; Lockwood & Kunda, 1997), unattainable comparison targets have only led to relative decreases in self-evaluations. That is, participants exposed to unattainable comparison targets have shown lower self-evaluations than participants exposed to attainable comparison targets, but have not differed significantly from participants in control conditions. Thus, in these types of experimental situations participants’ evaluations of their current states appear to be resistant to change. Therefore, to find that upward social comparisons increased the extent of self-discrepancies, comparison targets would need to increase levels of aspiration.

The two measures of aspiration, participant’s hoped for end of quarter and end of year GPA, were included in this study. If comparison targets led to higher aspiration levels, then participants exposed to unattainable comparison targets should have reported desiring higher GPAs both at the end of the quarter and at the end of the year. However, no such differences were found. In light of the findings of previous research and the lack
of an increase in aspiration level found here, it is not unexpected that no increases in the extent of self-discrepancies were found.
CHAPTER 3

EXPERIMENT 2: SOCIAL COMPARISON AND SPEED AND ACCURACY OF PERFORMANCE

Study 1 found that exposure to threatening, attainable, comparison targets led to adoption of a promotion focus. Study 2 examines the behavioral consequences of adopting that regulatory focus. Promotion focus is associated with use of eager-approach strategies (Higgins, 1987). Eager-approach strategies are designed to maximize the likelihood of attaining positives. In contrast, prevention focus is associated with the use of vigilant-avoid strategies. Vigilant-avoid strategies are designed to minimize the likelihood of experiencing negatives. Thus, individuals with a promotion focus may solve more problems and be quicker in solving problems while individuals with a prevention focus may be more accurate and slower in solving problems.

Overview

In Study 2, participants read about the same unattainable or attainable comparison targets as in Study 1. Then, participants completed a word selection task. On this task, participants were given four words and were to choose which word was not related to the other three. In previous research (Seibt & Forster, 2003) this task has been shown to be sensitive to regulatory focus. Individuals with a promotion focus tend to be less accurate
in completing the task and make more errors, while those with a prevention focus tend to
be more accurate, but slower. In addition, a measure of regulatory focus was
administered. Unattainable comparison targets were expected to be less accurate and
faster in completing the measure. Attainable comparison targets were expected to be
more accurate and slower in completing the measure.

Method

Participants

Forty-six university students participated in this experiment. All participants
received partial credit in fulfillment of a course requirement. All participants were under
21.

Design

A 3-cell design (Target attainability: attainable, unattainable, no-target control)
was employed

Materials

Comparison targets. The same comparison targets as used in Study 1 were
employed here. See Appendix A for full text.

Regulatory focus measure. The regulatory focus scale (Lockwood, 2002) was
also administered. The scale consisted of eight items and contained two subscales
measuring promotion (cronbach’s alpha = .88) and prevention (cronbach’s alpha = .53)
focus. Participant scores on each of the subscales were summed, and scores on the
prevention subscale were subtracted from the promotion subscale yielding a single score
in which higher numbers indicate greater promotion focus and lower numbers indicate greater prevention focus.

Performance measure. The performance task was structurally similar to the RAT. It presented participants with a series of words (e.g. banana, carrot, cherry, and apple) and the participants task was to identify which word identified a dissimilar object (e.g. carrot). This measure was sensitive to both speed and accuracy concerns (Seibt & Forster, 2004). In pilot testing, participants solved fewer items correctly under time constraints and were more accurate when given as much time as needed to complete the task. Participants were presented with 40 items on a computer and instructed to complete the task as fast as possible. Total time for solving all 40 problems was restricted to 3 minutes and total time spent on the problems was recorded. The time taken to provide an answer to each problem was recorded then a logarithmic transformation was completed in order to create a more normal distribution. These transformed times were averaged to create the measure of speed. While the number of solutions provided within the small framework might also have been used as a measure of speed, all participants completed all items, therefore only the time spent on the task was analyzed. Accuracy was measured as the ratio of wrong solutions to correct answers given.

Procedure

Participants were brought to the laboratory and informed that they would be completing two different studies. All materials and measures were presented on computer using Media Lab. The first “study” was described as a study of media influence in which they would be reading a short paragraph and giving their impressions.
During this phase of the experiment that participants read about the comparison targets. Then the promotion/prevention scale (Lockwood, 2002) was administered.

The “second study” was described as a validation study. Participants were told that another researcher was interested in validating a test of integrative orientation that had recently been converted to a computerized version. Participants were told to work as accurately and quickly as possible and that speed and accuracy were equally important in calculating their scores. After receiving instructions and viewing a sample question, participants were asked to give their performance expectancy and rated their liking of the task.

Following the word selection task, participants were asked to indicate what their goal was in completing the task using a seven-point scale with “maximizing speed” as one endpoint and “maximizing accuracy” at the other. Then, participants were debriefed.

Results

Adoption of eager-approach strategies was expected to impair performance accuracy while enhancing speed of performance. Participants exposed to the relevant target were expected to complete more problems overall, and make more mistakes in responding. To test these hypotheses, a one-way ANOVA examining mean differences in speed and accuracy was conducted. Time spent on the task served as a measure of speed, and number of items incorrectly answered divided by the number of correct answers served as a measure of accuracy (Seibt & Forster, 2004).

These analyses revealed no significant differences in overall performance, accuracy of performance, or speed of performance. While the omnibus tests did not
reveal significant differences, because specific hypotheses regarding the relative performance levels between each of the conditions had been generated, planned comparisons were conducted. The results of which are briefly discussed below.

*Accuracy of Performance.*

Unattainable comparison targets were expected to lead to less accurate performances than attainable comparison targets or control conditions. As seen in Figure 3.1, this pattern of results was found. The ratio of incorrect to correct responses among participants in the unattainable comparison target condition was .52. In the attainable target and control conditions, the ratio of incorrect to correct responses was .48. The differences in accuracy rates between participants in the unattainable condition and participants attainable and control conditions were marginally significant, $t(43) = -1.87$, $p = .07$. Thus, participants in the unattainable conditions appeared to be less cautious in providing responses. See Figure 3.1.
Figure 3.1  Ratio of incorrect to correct answers by type of comparison target

*Speed of performance*

No differences in speed of performance approached significance, $F$s $< 1.0$. Again, because all participants completed all problems, the number of problems completed was not analyzed nor regarded as a measure of speed of performance.

*Other Dependent Variables*
In addition to objective measures of accuracy and performance, several self-report measures were also administered. These measures included the regulatory focus scale and one-item measures of participant perceptions of the tasks, their strategies for completing the task, and their perceived performance.

*Regulatory Focus Scale.* Participants reading about the unattainable comparison targets were expected to have a promotion focus. A one-way ANOVA revealed no significant differences effects of condition on promotion motivation.

*Participant Perceptions of Task.* Participants were asked to rate the ease of the task and the effort they put forth on the task. No significant differences were found. Mean ease ratings were 3.16 and mean effort ratings were 3.70. Participants did not find the task to be extremely easy or difficult and exerted moderately low levels of effort.

*Participant Perceptions of Performance.* Participants were asked to report how many items they solved correctly. No significant differences were found.

*Participant Strategies.* Participants were asked to report their strategy for completing the task on a scale ranging from 1 (maximize speed) to 7 (maximize accuracy). No significant differences were found. On the scale, participants reported their strategy to be an equal balance of speed and accuracy ($M = 4.07$).

Discussion

Study 2 was designed to examine the hypothesis that attainable and unattainable comparison targets would be associated with different performance strategies. Unattainable comparison targets were expected to increase promotion orientation and lead to less cautious and speedier performance of the tasks. As expected, participants
reading about the unattainable comparison target were less accurate than those in the attainable and control conditions. However, analysis of other dependent variables did not similarly support the hypotheses. No differences in speed or regulatory focus were found.

A number of explanations may account for the lack of an effect of type of comparison target on speed of performance and the measures of self-regulatory focus. One such explanation may be a lack of power in this study. In this experiment, there were 16 participants in the attainable and control conditions, and 14 participants in the unattainable conditions. This number was thought to be adequate for testing the hypotheses presented here because previous research has revealed significant effects of type of comparison target on performance using 15 participants per condition (Johnson & Stapel, 2005c). However, this study employed a different measure of performance that used a multiple choice format rather than a fill-in-the blank format. Use of a multiple-choice format may have increased the likelihood that participants would guess and thus distort actual performance. Additionally, the computer program that administered the test to participants required that participants respond to every question. In effect, this forced participants to guess when they might not otherwise have done so. Again, this may have distorted speed of performance and accuracy of performance – because answers to every question were required, it was more difficult to detect when participants were guessing randomly and when they were making “educated” guesses in which they felt some confidence. Given this increased variability within conditions, a greater number of
participants may have been required to obtain the same power levels found in previous studies.

In retrospect, although the word selection task had been used by other researchers to demonstrate sensitivity to speed versus accuracy concerns (Seibt & Forster, 2004), another task might have been more effective. For example, a task such as the Alternations Test could have been used (Trope, 1982). This test provides participants with two mathematical statements. If the solutions to the first statement (e.g., $2 \times 3 + 2 = 8$) is greater than the solution to the second statement (e.g. $2 \times 3 - 2 = 4$), participants are instructed to subtract the second from the first. If the solution to the first statement is lesser than the solution to the second statement, participants are instructed to add the two solutions together. This type of task appears to be one in which greater time dedicated to solving each problem would lead to greater accuracy. This task may appear to naïve participants to be sensitive to speed versus accuracy concerns and might elicit more conscious and acute use of either strategy. In contrast, the word selection task may not appear to be a task in which greater effort would lead to better performance. Therefore, use of a speed or accuracy strategy might not have occurred to participants.

While Study 2 did not provide conclusive support for the challenge model, it did not conclusively refute the hypothesis either. No differences were found in the overall scores of participants in all three conditions, however, participants who had been exposed to the unattainable comparison target were less accurate than those who were exposed to the attainable comparison target or in the control condition. This suggests that unattainable comparison targets had some influence on the strategies employed by
participants in completing the tasks. In particular, it suggests that unattainable comparison targets led participants to be less cautious in solving problems, a characteristic of promotion-focused goal pursuit strategies.

Another reason that unattainable comparison targets may not have had the expected influence on the participants is that the participants did not find the comparison targets to relevant for social comparison. That is, participants may not have engaged in social comparison. While a number of steps were taken to maximize the relevance of the comparison target’s accomplishments for the participants, and recent research suggests that social comparison is an automatic process (Stapel & Suls, 2005), study 3 addressed the issue of relevance directly. In study 3, comparison target age was held constant, and relevance was manipulated.
CHAPTER 4

EXPERIMENT 3: SOCIAL COMPARISON AND CREATIVE AND ANALYTIC TASKS

Study 1 revealed that comparison with threatening targets led to greater promotion focus than comparison with non-threatening targets. Study 2 demonstrated that adoption of promotion focus was related to decreased accuracy of performance. These studies supported the assertion that unattainable comparison targets lead to increased performance because they are threatening and because they increase accessibility of self-discrepancies. As such, they provide some insight into the effects found in previous research. However, a number of questions remain. For instance, in a majority of the research demonstrating a relationship between threatening comparison targets and performance, the concepts of threat and performance have been operationalized in the same ways (Johnson et al., 2004; Johnson & Stapel, 2005; Johnson & Stapel, 2005a; Johnson & Stapel, 2005b). Threatening comparison targets have generally been described as the same age as participants while non-threatening comparison targets have been described as older (for exceptions, see Johnson & Stapel, 2005c; Johnson et al., 2004, Study 3). Additionally, performance has generally been

While the adherence to a proven methodology and a single paradigm has aided the search for boundary conditions to the performance effect, concerns about the generalizability of the effect may arise. For instance, because the RAT was initially designed to measure creativity (Mednick & Mednick, 1967) and unattainable comparison targets are thought to lead to better performance on creative tasks, one may be concerned that threatening targets will not lead to better performance on other tasks, either creative or non-creative. Study 3 addresses this concern.

Additionally, Study 3 employs different comparison targets. The model presented here suggests that aspiration-relevant and self-evaluation threatening comparison targets should lead to greater awareness of actual-ideal self-discrepancies. Previous research has relied largely upon age of comparison targets relative to the participants to create threat and alter performance. Study 3 manipulates the relevance of the comparison targets’ accomplishments to the participant while holding age constant. When the comparison targets were relevant, better performance was expected and when the comparison targets were irrelevant, no changes in performance were expected.

Overview

The design of Study 3 is relatively simple. Participants who read about comparison targets who had been successful in self-relevant domains are expected to react as though they had read about an unattainable comparison target: their actual-ideal discrepancies are expected be activated and lead to promotion focus. As in Study 2,
behavioral consequences of this promotion focus are expected such that participants perform better on a test of creativity and worse on a test of analytic ability.

In Study 3, participants were exposed to an aspiration relevant upward comparison target (threatening), an aspiration-irrelevant upward comparison target (non-threatening) or a control condition. The aspiration-relevant comparison target was expected to be threatening and lead to increased awareness of discrepancies between current and desired states. Aspiration irrelevant comparison target were not expected to threaten participants and not expected to increase awareness of discrepancies between current and desired states.

In addition to employing a different manipulation of threatening comparison targets, two different measures of performance were used: a logic task and a creativity task. If the effect found in previous work is limited to creative tasks such as the RAT, then a main effect for type of task should be found. However, if comparison targets are influencing regulatory focus, the interaction between type of comparison target and type of performance task on performance should be found. Previous work has found that promotion-focus is associated with better performance on creative tasks relative to analytic tasks (Friedman & Forster, 2001). Therefore, on the creative task, participants exposed to the relevant comparison target were expected to perform better than participants exposed to the irrelevant comparison target or the control group. On the analytic task, no differences were expected.

Method

Participants
Ninety-two university students participated in this experiment. All participants were recruited for the experiment based on information provided in a mass testing session. Students whose declared majors were science or humanities related were recruited and receive partial credit towards fulfillment of a course requirement.

**Design**

A 3 (Target Relevance: relevant, irrelevant, control) x [2 (Type of Task: creative or analytic)] within-participants design was employed.

**Materials**

*Comparison targets.* Paragraphs were prepared describing a successful student named James Marshall. In all conditions, the target was described as the winner of a prestigious award and $8,000 prize. Only the domain of the success was manipulated.

The science-successful comparison target was described as winning an award “because of his analytical and mathematical abilities.” James was also described as “a considerate and interesting member of the student community.” According to the paragraph, candidates for the award included natural science majors, which were described as chemistry, math, biology, engineering and health sciences majors.

The verbal-successful comparison target was described as winning the award “because of his verbal and creative abilities” and was praised for “the ease with which James understood and communicated complicated ideas to others.” As with the science-successful target, James was described as socially successful. According to the paragraph, candidates for the award included humanities majors, which were described as
communications, education, business, and English majors. The exact text of the verbal and science-successful targets can be found in Appendix D.

In the control condition, participants read about the same university construction project that used in studies 1 and 2.

**Performance measures.** Creative and analytic measures that have been previously validated by other research (Friedman & Forster, 2001) were used here.

*Creativity Task.* Participants were instructed to spend four minutes generating creative uses for a brick. Included were instructions to avoid listing common uses and impossible uses. Participants were told that the creativity of their responses would be scored by a panel of experts and that their score would reflect their integrative orientation abilities. For exact wording of instructions, see Appendices E and F.

Scoring of the responses was conducted in two phases. First, responses collected during pilot testing were ranked from least creative to most creative by trained judges. Then, responses were scored for creativity. Responses that were similar (e.g., “step on to be taller” and “stepstool”) were given the same score. Second, new responses obtained in the experiment, but not previously given in the pilot study, were ranked within the context of the responses collected in the pilot study. Thus a single list of all responses ($N = 459$) was created and all responses were rated on a scale of 1 (not at all creative) to 10 (extremely creative). Then, the average creativity rating of all responses given by a single participant was calculated, yielding a single creativity score. The judges’ overall creativity scores were significantly correlated with one another ($r = .66$, $p < .001$).
Analytic Task. Participants were given six logic questions. These questions were similar to those found in the analytic version of the GRE, and pretested to be solvable by our participant population. The logic problems and solutions can be found in AppendixG.

Procedure

Participants were brought to the laboratory and told that they would be completing two different studies. All materials and measures were presented on computer using Media Lab. The first “study” was described as a study of media influence in which they would be reading a short paragraph and giving their impressions. It is during this phase of the experiment that participants read about the comparison targets.

In the second part of the experiment, participants were told that another researcher was interested in validating tests of logic and creativity. Participants always completed the logic task first, followed by the creativity task. All instructions for each task were presented just prior to completing them. Following completion of the tasks, participants were asked to complete the promotion prevention scale (Lockwood, 2002) and asked to rate the difficulty, enjoyability, ease, and effort expended on the creativity and logic tasks. All responses were recorded on 7-point scales in which 1 represented not at all and 7 represented extremely. Then, participants were asked to recall the stories they read about in the first part of the study. After recalling the stories, they were asked to report how discouraged and inspired they felt by the people in the stories. Finally, participants were asked to report their majors.
Results and Discussion

Coding of conditions

The major that participants reported during the experimental session was used to categorize participants as science majors or humanities/social science majors and create the relevant/irrelevant target conditions. Science majors who read about a successful science student \((n = 18)\) and humanities/social sciences majors who read about a successful humanities student \((n = 16)\) were placed in the relevant condition. Science majors who read about a successful humanities student \((n = 19)\) and humanities/social science majors who read about a successful science student \((n = 21)\) were placed in the irrelevant condition. This coding, in addition to collapsing across major to create the control condition \((n = 29)\), yielded a 3\(\text{(type of target: relevant, irrelevant, control)}\) x 2\(\text{(test type: analytical versus creative)}\) design, with type of test as the repeated measure.

Additionally, for analyses in which performance on analytical and creative tasks were compared, standardized performance scores were created.

Performance measures

The primary hypothesis in Study 3 concerned performance. Relevant and irrelevant comparison targets were expected to influence performance in ways compatible with a promotion or prevention regulatory focus, respectively. To test this hypothesis, a 3\(\text{(type of target: relevant, irrelevant, control)}\) x 2\(\text{(type of test: analytical, creative)}\) within-subjects ANOVA was conducted. No significant main effects were found, however the effect of the interaction was found to be significant, \(F(2,90) = 3.76\) \(p = .03\). The pattern of means may be found in Figure 4.1.
Further analysis revealed that participants in the control conditions, who did not read about a comparison target, performed equally well on the analytic and creativity tasks. On the other hand, the performance of those who did read about a comparison differed depending upon the type of task. This difference, however, was in the opposite direction than expected. Those in the relevant condition, who were expected to show increases in promotion focus, performed better on the analytic task ($M = .32$) than on the
creativity task \((M = -0.24), F(2, 90) = 2.60, p = .08\). Their performance on the creativity
tasks improved compared to the control condition \((M = -0.03; F(2. 90) = 2.51, p = .09)\),
and their performance on the analytic tasks declined compared to the control condition
\((M = -0.10), F(2, 90) = 2.62, p = .08\). Among those in the irrelevant condition and those in
the control condition, no differences in performance on the creative or analytic tasks were
found.

*The importance of performance domain.* Thus, while the relevant comparison
target affected performance, replicating previous research on threatening comparison
targets, the direction of the effect was opposite to what was expected. Rather than
improving performance on creative tasks, relevant comparison targets improved
performance on analytic tasks.

Recent research by Johnson and Stapel (2005) may help explain why this
performance pattern was found. They found that not only is the relevance of the
comparison target domain of success to the perceiver important, but also the relevance of
the target domain of success to the performance task. In their studies, when unattainable
comparison targets were described as having performed well in verbal domains and
participants were asked to complete a verbal ability task, no performance improvements
were found. When unattainable comparison targets were described as having performed
well in mathematical domains and participants were asked to complete a verbal ability
task, performance improvements were found. This was interpreted as evidence that self-
evaluation maintenance strategies were responsible for performance improvements;
participants were performing better in domains in which they could foresee performing better than the comparison target.

In the current study, the performance tasks were described as measures of analytic and creative ability in all conditions. Unfortunately, this may have created a variety of matching and mismatching conditions: participants may have viewed the analytic task as matching the science-successful target and the creative task as matching the verbal-successful target. Additionally, the tasks could have been more or less relevant to the participants, depending upon their major. For example, when science majors read about a science-successful target and then completed an analytical task, all three domains matched. Therefore, while the target may have been threatening, the task did not present an opportunity to outperform the target and no performance improvement may be expected. Conversely, when science majors read about a verbal-successful target and then completed an analytical task, the domains did not match. Therefore, an analytical task may have presented the participant with an opportunity to outperform the target and performance improvement may be expected.

To test this additional matching hypothesis, a 2 (participant major: science or humanities/social science) x 3 (type of comparison target: science-successful, verbal-successful, control) x 2 (type of task: analytic or verbal) analysis was conducted. The three-way interaction was found to be significant \( (F(2,87) = 4.95, p = .009) \), and no lower order effects were found to be significant, \( Fs < 1.0 \). The overall pattern of means is depicted in Figure 4.2.
Figure 4.2: Performance on analytic and creativity task by participant major and comparison target domain of success.

For ease of interpretation, performances on the analytic and creativity task were examined separately. In these analyses, raw scores were used. Additionally, when speaking about the relation between participant major and the domains of the performance task and the comparison target, the terms “relevant” and “irrelevant” will be used. For science majors, the science-successful comparison target and the analytical task were relevant. For humanities majors, the verbal-successful comparison target and the creative task were relevant. When speaking about the relation between the domains
of the performance tasks and the comparison targets, the terms “match” and “mismatch” will be used. The verbal task matched the verbal-successful comparison target and the analytical task matched the science-successful comparison target.

![Graph](attachment:image.png)

Figure 4.3: Performance on analytic task by participant major and type of comparison target.

**Performance on analytic task.** As shown in Figure 4.3, the verbal-successful comparison target appeared to influence performance on the analytic task, while the science-successful target did not. That is, when the domain of success of the target matched the domain of the performance task, performances did not differ from the control condition, $F < 1.0$. However, when the domain of success of the target
mismatched the domain of the performance task, performance was affected. Humanities majors exposed to a verbal-successful comparison target performed better ($M = 3.32$) on the analytic task than did humanities majors exposed to a science-successful comparison target ($M = 2.21$), $F(2,96) = 5.88$, $p = .08$. In other words, relevant comparison targets led to performance improvements on tasks that mismatched the target’s domain of success.

---

Figure 4.4: Performance on creativity task by participant major and type of comparison target.
Performance on creativity task. In analyses examining creative performance, performance on the analytical task (which was always completed first) was included as a covariate. As shown in Figure 4.4, the influence of science-successful and verbal-successful comparison targets on performance was moderated by their relevance to the participants, $F(2, 86) = 3.24, p = .04$. When science majors read about a science-successful comparison target, their performance was significantly worse ($M = 5.29$) than when they read about a verbal-successful comparison target ($M = 5.91, F(2, 86) = 3.34, p = .04$). However, only the verbal-successful condition differed significantly from the control condition.

When humanities majors read about a verbal-successful comparison target their performance tended to be worse ($M = 5.23$) than when they read about a science-successful comparison target ($M = 5.60, F(2, 86) = 2.63, p = .07$). Restated in terms of matching and relevance, it appears that when the domain of the comparison target’s success and the performance domain matched and were irrelevant to the participant, performance on the creativity task improved.

This result may be explained within the context of matching effects. While a verbal-successful target may have been threatening to humanities majors, the creativity task did not provide an opportunity for engaging in self-esteem maintenance, therefore, performance was detrimentally affected. However, science majors were not threatened by the verbal-successful target. Therefore, those participants should not have any strategic concerns and test domain should not matter. Thus, the fact that the test domain matched was not an impediment to performance.
Testing Regulatory focus

Relevant comparison targets were expected to increase promotion focus. To test these predictions the regulatory focus scale (Lockwood, 2002) was administered just prior to debriefing of participants.

No differences in the regulatory focus of participants in the matching, mismatching, and control conditions were found, $F < 1.0$. Because the interaction of the type of comparison target and participant major was influential in determining performance, that interaction was also examined here. Equally, however, no significant effects of type of comparison target or major on regulatory focus was found. This lack of effects may be attributed to the time of administration of the scale. The measure was administered temporally distant from the exposure to the comparison target and other achievement related thoughts may have been activated by the two performance tasks, thus making it more difficult to detect changes in regulatory focus.

Perceptions of task

In addition to collecting performance data, participant impressions of the different tasks were also measured. While these are only secondary dependent variables, the way that participants viewed the tasks in terms of how enjoyable, difficult, easy, and how much effort they put into the task could be illuminating. If tasks were viewed as opportunities for self-evaluation maintenance, as predicted by the threat hypothesis and previous research, then one might expect that participants would exert more effort on the task. A series of 2(participant major) x 3 (type of comparison target) ANCOVA, controlling for actual performance on the particular task, were conducted. No differences
in enjoyability or effort on the analytic task were found. Equally, no differences in the difficulty or the effort on the creative task were found.

As Table 4.1 shows, however, difficulty on the analytic task and enjoyability of the creativity task were affected by participant major and the type of comparison target. The main effect of participant major on perceived difficulty of the analytic task was significant, $F(2, 96) = 4.27, p = .04$. Science majors perceived the task to be more difficult than did humanities majors.

Analysis revealed that the interaction effect of participant major and type of comparison target on enjoyability of the creativity task was significant, $F(2, 85) = 4.07, p = .02$. When participants read about relevant comparison targets, they expressed less enjoyment of the creativity task than when they read about irrelevant comparison targets, $F(2, 88) = 3.71, p = .03$. 
Table 4.1. Participant perceptions of analytic and creativity tasks controlling for performance on each task

<table>
<thead>
<tr>
<th></th>
<th>Science Majors</th>
<th>Humanities Majors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Math Target</td>
<td>Verbal Target</td>
</tr>
<tr>
<td>Difficulty of analytic task</td>
<td>3.29</td>
<td>3.16</td>
</tr>
<tr>
<td>Enjoyability of creativity task (controlling for analytic and creative performance)</td>
<td>2.43</td>
<td>2.97</td>
</tr>
</tbody>
</table>

Perceptions of targets

At the end of the experiment, participants were asked to rate how inspired and discouraged they were by the stories. Relevant comparison targets were expected to be inspiring, while irrelevant comparison targets were expected to discouraging. One-way analyses revealed that both relevant ($M = 2.44$) and irrelevant ($M = 2.53$) comparison targets led to higher inspiration than the control condition ($M = 2.07$), $t(99) = 2.14, p = .04$. However, the comparison target conditions did not differ significantly from one another. No differences in feelings of discouragement were found.
Conclusions Study 3

Study 3 had two purposes. First, the study explored additional conceptualizations of threatening comparison targets. It was expected that because an aspiration relevant comparison target makes actual-ideal self-discrepancies more accessible and leads to adoption of a promotion focus, the target should also lead to better performance on creative tasks. An aspiration irrelevant comparison target was expected to lead to better performance on analytic tasks. Although social comparisons did impact performance, relevance of the comparison target alone could not account for the effect. Instead, the relationships between the participant, the comparison target, and the task appeared to account for the performance effects.

While conceptually, participant major should not have affected performance, different patterns of effects emerged for each major. That is, only the relevance of the target’s domain of success to the participants major was predicted to be influential in determining performance responses. When the target’s domain was relevant, participants were expected to adopt a promotion focus. When the target’s domain was irrelevant, participants were expected to adopt a prevention focus. Promotion focus was expected to benefit performance on creative tasks, while prevention focus was expected to benefit performance on analytical tasks. Instead, relevance and irrelevance of target domain to the participants was not adequate for predicting participant performance; consideration of the match between target domain and task domain was also required.

*When does regulatory focus apply?* On the creativity task, which was expected to benefit from promotion focus, participants performed best when both the comparison
target and the domain of performance were irrelevant. This effect can be explained as follows. Because the comparison target was irrelevant, the participants were not threatened and no particular regulatory focus was adopted. Thus, no self-evaluation maintenance or performance strategies were expected to be activated and the task domain should have been unimportant. Because the domain was unimportant, simple goal contagion or priming effects may have occurred (Aarts, Gollwitzer, & Hassin, 2004). That is, when participants did not need to attend to the performance domain, they might have been susceptible other influences in the situation. For example, research by Dijksterhuis and van Knippenberg (1998) has shown that when individuals are exposed to the stereotypes of intellectually successful others, but do not engage in comparison with a particular other, those individuals may perform better on intellectual tasks.

*When other motivations take precedence.* Similarly, the initiation of self-evaluation maintenance strategies may be used to explain the lowered performance of participants when the target domain was relevant and task domain matched the participant. Outperformance in aspiration-relevant domains threatened participants, and increased their preference for tasks in alternative domains, perhaps to avoid performing in the same domain as the comparison target. To maximize the chance that boosts to self-regard would occur and minimize the chance that further threats would be experienced, participants might even prefer tasks that are less familiar and less personally relevant. Examination of the analytic performance shows this pattern. Participants who were humanities majors who read about a verbal comparison target performed poorly on the creative task, but quite well on the analytic task. They were threatened by the verbal
comparison target, they did not view the creative task as an opportunity to repair self-regard, but they did view the analytic task as an opportunity to repair self-regard and performed better on that task.

Limitations

Categorizing Majors. While the findings of this study are extremely suggestive, there are limitations to the conclusions that may be drawn. For example, a number of the results discussed were only marginally significant. Most of participants in this experiment were first-year students and their identification with their majors may not be strong. Thus, they may not have been as affected by the domain of the comparison targets, reducing the size of the effect and requiring a larger number of participants to detect it. Additionally, for many majors it is not clear whether participants see them as humanities or sciences. For the purposes of this study, social sciences such as economics and psychology were collapsed into the humanities and the award won by the verbally-successful comparison target was specifically said to be available to those majors. Participants gave their majors, but were not asked whether they considered themselves to be science or humanities majors. The experimenter coded these responses and it could difficult to categorize a major. For example, it is unclear if an exercise science major saw himself as a science major. In fact, the categories might more appropriately be labeled science and non-science majors.
The primary goal of this research was to illuminate the process by which upward comparison targets influence performance. Specifically, it was argued that aspiration-relevant comparison targets who also threaten self-regard remind individuals of their ideal-selves. In addition to reminding individuals of what they would like to accomplish, such comparison targets also highlight how distant individuals are from those accomplishments. As a consequence of this increased awareness and accessibility of actual-ideal discrepancies, individuals were thought to adopt a promotion-oriented regulatory focus. Adoption of this focus was expected to lead to less accurate performance on some tasks, but better performance on creative tasks.

Summary of results

The challenge model was weakly supported. Study 1 found that unattainable comparison targets led to increased accessibility of ideal self-guides and of actual-ideal discrepancies. These same comparison targets also led to increased promotion focus. In reminding individuals of their aspirations, yet precluding them from the possibility of attaining those specific aspirations, unattainable comparison targets increased awareness
of ideal self-aspects. This increased awareness was associated with increases in promotion focus. This study demonstrated that social comparison and self-discrepancies are linked – exposure to unattainable comparison targets influenced self-discrepancies. The second study looked one step further and searched for behavioral evidence of the activated self-discrepancies.

Study 2 attempted to demonstrate an association between attainability (and therefore threat) and the strategies employed to complete a task. Specifically, it was expected that unattainable comparison targets would lead to increased speed of performance, but decreased accuracy of performance. Although no differences in speed were found, participants who read about the unattainable comparison targets were less accurate in completing the task than participants in the control condition. Their ratio of incorrect to correct answers was higher than the ratio of other participants. This finding may be regarded as supportive of the hypothesis that regulatory focus impacts choice of strategies, but is not conclusive. Two potential problems were identified: a lack of power in the analysis because of limitations on the number of participants, and a performance task which was not as sensitive to speed versus accuracy concerns as desired. Both of these issues could be addressed in future research.

The original design and predictions in Study 3 were relatively simple. Participants who read about comparison targets who had been successful in self-relevant domains were expected to react as though they had read about an unattainable comparison target: their actual-ideal discrepancies were expected to be activated and lead to promotion focus. As in Study 2, behavioral consequences of this promotion focus
were expected such that participants would perform better on a test of creativity and worse on a test of analytic ability. Study 3 did find that exposure to comparison targets influenced performance. However, the relationship between perceivers and comparison target domains was moderated by the domain of the performance task.

Because promotion focus is associated with better performance on creative tasks, exposure to relevant comparison targets was expected to increase performance on creative tasks. This effect was found, but only when the task was unrelated to the comparison target’s domain of success. When participants read about a relevant comparison target, but were then given an opportunity to perform in a domain that was less related to their majors, participants performed best.

On the analytic task, participants performed best when the comparison targets were successful in a relevant domain, but the performance task was not relevant. This finding was similar to previous findings (Johnson & Stapel, 2005) in which unattainable comparison targets only influenced performance on tasks which were unrelated to the comparison target’s domain of success. In those studies, and here, this was taken as evidence of strategic performance on the part of participants. There is a lower likelihood of desirable comparisons in domains matching that of the comparison target compared to domains in which the comparison target has already been shown to be more successful. Therefore, expending effort in an alternative domain is more likely to result in self-evaluation boosting downward comparisons with the comparison target than expending effort in the target’s domain.
Overall, these findings suggest that social comparison and the activation of self-discrepancies are linked. Study 1 demonstrated that upward comparison with aspiration-relevant others makes individuals more aware of their current selves and their ideal selves. Studies 2 and 3 explored the downstream consequences of the activation of self-discrepancies.

Conclusions

In conducting these studies, there were two goals in mind. First, this research sought to link two areas of research within social psychology: social comparison and self-discrepancy. Second, this research tested the challenge model for why unattainable comparison targets have led to improved performance in previous research. While there was some evidence that social comparison can influence awareness of self-discrepancies, the findings were not conclusive. Indeed, more questions may arise from these findings than are answered.

In Study 1, only increases in accessibility of actual-ideal discrepancies were found to be significant, yet there was a strikingly similar pattern for actual-ought discrepancies. It is not clear why this would occur. According to the challenge model, upward comparison targets should increase actual-ideal discrepancies. Additionally, the increases in promotion focus should also be related to increases in actual-ideal discrepancies and not to increases in actual-ought discrepancies. How then to explain the ought-self findings? One possible explanation is that upward comparisons may increase accessibility of already accessible discrepancies. That is, for those who have a chronically accessible ideal self-guide, comparison merely boosts the accessibility of that
guide. For those with a chronically accessible ought self-guide, comparison boosts accessibility of that self-guide. Measures of chronic accessibility were not available in these studies, so it is not possible to test the moderating role of chronic accessibility.

Another potential explanation is that exposure to someone of the same age, our unattainable comparison target, leads to social comparison processes which increase self-awareness while exposure to someone older, our attainable comparison target, leads to a different cognitive process. Exposure to someone older could lead to temporal comparison (Wilson & Ross, 2001). That is, instead of comparing the current self to another person, exposure to an older successful other may lead to individuals to compare their current selves to their future selves. This future self may be basking in the reflected glory of the successful other and thus, lead to increased self-evaluations. This explanation is not without flaws. For instance, one might also expect that such a comparison with future selves would also increase accessibility of ideal and ought selves, since ideal and ought selves may represent future-desired selves. No evidence of older comparison targets increasing accessibility of either self-aspect was found. Additionally, if temporal comparisons do activate both current selves and a future self, it should lead to the mental contrast necessary for motivation to arise (Oettingen & Mayer, 2003). Thus, such a temporal comparison should have some motivational consequences. Future research could explore these avenues.

Ultimately, neither Study 1 nor Study 2 provides conclusive evidence for the challenge model. Study 3 provides no support for the challenge model and is strongly supportive of the threat model. Recall, however, that these studies were not intended to
pit one model against the other. Therefore, while the threat model appears to explain the previously found performance results better, the challenge model is not without some merit. Alterations to the challenge model are warranted. For instance, the original version of the challenge model suggested that only actual-ideal discrepancies would be affected by the comparison targets, when in fact both actual-ideal and actual-ought discrepancies appear to have been affected. Thus, a revised challenge model must account for this result, perhaps through identification of an individual difference variable.

Implications

This research links two flourishing lines of research within social psychology. In addition, these findings have implications for programs and interventions designed to impact performance.

Relative Importance of Motivation and Regulatory Focus

While these findings support the assertion that social comparisons may impact self-discrepancies, they also suggest that regulatory focus is only important when one is already motivated to achieve.

The motivation to maintain positive self-evaluations is a primary motive (Baumeister, 1998; Dunning, 2004). Because social comparison can threaten self-regard, it can also elicit motivations to repair self-regard. There are several different methods by which self-regard may be repaired, and achievement is but one (Tesser, 1988; Tesser, Martin & Cornell, 1996). Achievement is chosen as route to self-regard repair only when the task provides such an opportunity. For instance, if the task is in the domain in which threat to self-evaluations has previously occurred, performance on it is less likely to be
regarded as a means of achieving positive self-evaluations. Withdrawal from domains in which self-regard has been threatened in engagement in alternative domains is a strategy long described by researchers (Crocker & Major, 1989; Major et al., 1998; Osborne, 1997; Steele, 1997). When individuals withdraw from a task, or fail to engage in the first place, evidence of their regulatory focus is less likely to be seen. That is, if one does not have a goal for a task, it is less likely that task-related strategies will be elicited. Thus, while social comparisons may make self-discrepancies more accessible and more available, those discrepancies are unlikely to affect performance on tasks with which individuals are not engaged.

This pattern is seen in Study 3. Performance on the creative task was expected to most impacted by comparison. Aspiration-relevant targets were expected to make actual-ideal discrepancies more accessible and lead to promotion focus, which leads to better performance on creative tasks. The effect of regulatory focus (improved performance) was moderated by whether or not the creativity task provided an opportunity for self-regard repair. On the creative task, which was a domain in which repairs to self-regard were less likely for participants for whom the verbal domain mattered (humanities majors) and for whom the task matched the domain of threat (verbal-successful comparison target), the lowest levels of performance were found. On the same task, when the task mismatched the domain of threat (science-successful comparison target), but was still important to the participant (humanities majors), the highest levels of performance were found. On the analytical task, performance was maximized for
participants for whom the domain did not matter (humanities majors) and for whom the
task mismatched the domain of threat (verbal-successful comparison others).

It is not surprising that the accessibility of self-discrepancies may only be
influential when one is already motivated to achieve on a task. However, these findings
are a reminder that, in talking about the impact and importance of regulatory foci and
self-discrepancies, one must remember that a goal-pursuit process must already be
engaged. For example, if one wanted to design an intervention to raise student or
employee performance levels through changes in regulatory focus, one must first ensure
that students and employees are already engaged in the task. If they do not view the task
as fulfilling some other motivation (e.g. high self-regard, consistency) then the
intervention is unlikely to impact performance.

Attainability, relevance, and social comparison

Throughout these studies, the terms attainable, relevant, and threatening have
been regarded as somewhat synonymous. This interchangeability is derived from
operational definitions; attainable comparison targets have been designed to be relevant
to participants and have elicited threat. However, conceptually, these constructs may be
quite different. While the intention of Study 3 was to manipulate relevance without
manipulating attainability, the two were, in fact, confounded. Participants reading about
a comparison target who had won an award in a different domain than their own were
exposed to a target who was irrelevant and whose accomplishment was unattainable.
Participants reading about a comparison target who had won an award in the same
domain as their own were exposed to a target who was relevant and accomplishment was
attainable. Despite this confounding, relevant comparison targets led to predictable performance improvements while attainability did not have the predicted effect. Thus, it appears that perceived attainability plays less of a role in improving performance than has been assumed by previous research. Instead, a more inclusive term, such as similarity, might prove to be a more appropriate term for the conceptual variable. Indeed, previous research may be reframed in this manner, and future research should focus on the identification of the underlying constructs leading to performance increases.

Types of tasks impacted by comparison targets.

One of the purposes of this research was to demonstrate that unattainable or threatening comparison targets impact performance on tasks other than the RAT. This goal has been met, at least partially. Although attainability of comparison targets did not influence overall performance on the word selection task in Study 2, it did affect the accuracy of performance. Additionally, in Study 3, performance improved on the task when it was unrelated to the comparison target’s domain of success. The results of the creativity task in Study 3 provide the best example of relevant comparison targets influence performance. Relevant comparison targets led to better performance than irrelevant comparison targets. However, the creativity task used in Study 3 still resembles the RAT. Like the RAT, it measures creativity and requires participants to draw connections between objects. In the RAT, participants must be able to see how different words might be interpreted and connected, while on the brick task, participants must be able to see how a single object might be viewed and connected to different uses. Additionally, like the RAT, the brick task is generative. That is, participants are not
given an array of options from which to choose, but must generate answers themselves. Such a task might be considered more difficult. While comparison targets impact performance on a variety of tasks, it appears that this impact is greatest on cognitively demanding and difficult tasks. Indeed, previous research in which participants were administered easy or difficult versions of the RAT has found this effect (Johnson & Stapel, 2005a).

The fact that comparison targets are most influential in how individuals perform on difficult tasks is not necessarily a limitation. In fact, one could argue that it is more important to understand how to improve performance on difficult tasks than how to change performance on easy tasks. For instance, stereotype threat, a phenomenon in which fear of confirming a negative stereotype harms performance (Steele & Aronson, 1995), is most apparent on difficult tasks. Thus, a model which predicts improvements in performance on difficult tasks would be more useful in designing interventions to overcome stereotype threat.

Conclusions

When Mark Twain said “There is nothing more annoying than a good example” he was referring to the discomfort one feels following upward social comparison. The social comparison literature has aptly documented how and when upward comparisons are annoying, disheartening, and even inspiring. More recently, research has described how upward comparisons can help individuals reach higher levels of performance. This research has suggested that the discomfort that follows social comparison stems from
threats to self-evaluations and that individuals are motivated to reduce that discomfort through increased performance.

The present research suggests that upward comparisons cause discomfort not only because it highlights the discrepancies between oneself and another, but also between one’s accomplishments and one’s goals. In making this argument, the present research linked two prolific lines of social psychological research: social comparison theory and self-discrepancy theory. Social comparisons may not only threaten self-evaluations and impact performance, but may also make individuals aware of how far they are from their aspirations and impact performance.

Thus, good examples may annoy us, as Twain suggested, not only because they make us feel inferior to others, but also because they make us feel inferior to who we feel we want and should be. Fortunately, however, we are able to convert this annoyance and discomfort into tangible performance benefits.


Johnson, C. S. & Stapel, D. (2005b). Not all threats (or boosts) to self-evaluations are the same: Performance following social comparison. Unpublished manuscript. The Ohio State University.


APPENDIX A

COMPARISON TARGET VIGNETTES, STUDIES 1 AND 2
Senior Scholarship Winner Announced

The OSU Alumni Council recently announced that senior James Marshall is the winner of the Martin McAlister Award. James is one of five awardees chosen from among all graduating students. The award was given to James because he demonstrated, in his last two years of college, remarkable intellectual achievement, and superior creativity in seeking solutions to difficult problems. In particular, the award judges were impressed with James’ consistent improvement over his four years in college. Additionally, each of his references commented on his ability to see and solve problems in unique ways. His former professor added that in addition to being a good performer in the classroom, James was active in school events and popular among the students.

The award will provide James with $20,000 over the next four years. The money will be used to pay tuition, books, living, and travel expenses. To be eligible for the award, James competed with other students entering the last year at OSU.
Freshman Scholarship Winner Announced

The OSU Alumni Council recently announced that first year student James Marshall is the winner of the Martin McAlister Award. James is one of five awardees chosen from among all incoming first year students. The award was given to James because he demonstrated, in his last two years of high school, remarkable intellectual achievement, and superior creativity in seeking solutions to difficult problems. In particular, the award judges were impressed with James' consistent improvement over his four years in high school. Additionally, each of his references commented on his ability to see and solve problems in unique ways. His former teacher added that in addition to being a good performer in the classroom, James was active in school events and popular among the students.

The award will provide James with $20,000 over the next four years. The money will be used to pay tuition, books, living, and travel expenses. To be eligible for the award, James competed with other students entering their first year at OSU. Applications were made the spring before entering the university.
Ground Breaking

Well over 100 business and academic professionals, residents, county leaders and commissioners and committee and organization members throughout southern Ohio gathered at Ohio State University's South Centers at Piketon on Oct. 31 to witness the groundbreaking of the Endeavor Center Business Incubator and Training facility.

The 27,000 square foot building is designed to increase jobs and enhance the economic development of the region through assistance, education and training. The site will be made available to new and expanding businesses within Ross, Pike, Jackson, Scioto and adjacent counties.

When completed, the facility will offer 26 spaces differing in size and use. The training wing of the new building will also provide housing for Ohio State's Learning Center South, which currently provides programs for the community in a small computer lab and auditorium. The new and expanded learning center facility will include two classrooms, a computer laboratory and conference areas to accommodate meetings for various sized training classes. Tailored programs are being developed for the needs of businesses and citizens throughout the region, as well as professional development classes for local teachers and administrators.
APPENDIX B

REGULATORY FOCUS SCALE
Regulatory Focus Scale (Lockwood, 2002).

<table>
<thead>
<tr>
<th></th>
<th>Not at all true of me</th>
<th>Very true of me</th>
</tr>
</thead>
<tbody>
<tr>
<td>I am more concerned with avoiding failure than with achieving success</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I am very concerned about the discrepancies between who I am now and who I think I ought to be</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>My major goal in school right now is to achieve my academic ambitions</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I see myself as someone who is primarily striving to reach my “ideal self” – to fulfill my hopes, wishes and aspirations</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>Overall, I am more oriented towards achieving success than preventing failure</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I typically focus on the success I hope to achieve in the future</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>I see myself as someone who is primarily striving to become the self I “ought” to be – to fulfill my responsibilities, duties, and obligations.</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
<tr>
<td>My primary goal in school right now is to avoid becoming an academic failure</td>
<td>1 2 3 4 5 6 7</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

WORD SELECTION TASK
Word Selection Task with solutions in **bold**

1. Mouse  
   **Birdcage**  
   Shark  
   Iguana  

2. **a cooker**  
   a chef  
   a professor  
   a mechanic  

3. a tray table  
   a flight attendant  
   **a conductor**  
   an overhead bin  

4. shuffle  
   deal  
   **roll**  
   win  

5. sink  
   stove  
   refrigerator  
   **bathtub**  

6. the skin  
   fingers  
   knees  
   **socks**  

7. a magazine  
   an article  
   a journal  
   **a pillow**  

8. boots  
   sneakers  
   flats  
   **pants**  

9. a candle  
   a lamp  
   **a sword**  
   a flashlight  

10. a chair  
    a seat  
    a couch  
    **a ladder**  

11. a trombone  
    a clarinet  
    drums  
    **a champagne flute**  

12. bark  
    leash  
    paws  
    **purr**  

13. desk  
    **briefcase**  
    chair  
    table  

14. computer  
    screen  
    mouse  
    **diary**  

15. walk  
    run  
    **sneeze**  
    sprint
16. think
   reflect
type
   consider

17. eyes
   hose
   ears
   mouth

18. rabbit
   cow
   pit
   goat

19. shaving cream
    saucepan
    towel
    plug

20. sales
    marketing
    production
humans

21. guitar
    harp
    trumpet
    violin

22. gold
    platinum
ivory
    silver

23. plane
eagle
cloud
squirrel

24. mars
    moon
    earth
    Pluto

25. brook
    pond
    stream
    river

26. table
    wood
    cupboard
    chair

27. shirt
    cloth
    trousers
    jacket

28. pen
    paper
    pencil
    crayon

29. carbon
    aluminum
    copper
    iron

30. August
    December
    January
November

31. lake
    pond
    water
    pool

32. bungalow
    hut
    cottage
farm

33. cheese
    yogurt
    butter
    milk

34. trumpet
    flute
    guitar
    bugle

35. low
    now
    cow
    how

36. Tokyo
    Japan
    France
    Germany
37. feet
tooth
pants
scissors

38. basketball
volleyball
**badminton**
tennis

39. comb
dog
**brush**
shark

40. photo
twig
**toes**
fingers
APPENDIX D

VERBAL AND SCIENCE-SUCCESSFUL COMPARISON TARGETS
Scholarship Winner Announced

The Alumni Council has announced that James Marshall is the winner of the first Martin Macalester Prize. James was one of the five finalists from among 213 second year students nominated by faculty committees. All participants were science majors who had done well in their classes.

According to the selection committee, James won because of his analytical and mathematical abilities. In particular, James demonstrated creativity in identifying problems as well as formulating solutions for difficult problems. For example, selection committee members noted the ease with which James organized and integrated scientific information. Moreover, in letters of recommendation, faculty members indicated that James was exceptional in his ability to find “clear and logical solutions to everyday problems.” This professor added that James was not only an excellent student, but also a considerate and interesting member of the student community. In their announcement, the selection praised James for his insight, youth and enthusiasm.

In winning the award, James received a sum of $5,000. To qualify for the prize James competed against natural science majors (e.g. chemistry, math, biology, engineering and health sciences majors) who had also received high grades during their first year at OSU.
Scholarship Winner Announced

The Alumni Council has announced that James Marshall is the winner of the first Martin Macalester Prize. James was one of the five finalists from among 213 second-year students nominated by faculty committees. All participants were humanities majors who had done well in their classes.

According to the selection committee, James won because of his verbal and creative abilities. In particular, James demonstrated creativity in identifying problems as well as communicating these solutions to others. For example, selection committee members noted the ease with which James understood and communicated complicated ideas to others. Moreover, in letters of recommendation, faculty members indicated that James was "exceptional in his verbal abilities — both in written and oral communication." This professor added that James was not only an excellent student, but also a considerate and interesting member of the student community. In their announcement, the selection praised James for his insight, youth and enthusiasm.

In winning the award, James received a sum of $8,000. To qualify for the prize, James competed against humanities majors (e.g. communications, education, business, and English majors) who had also received high grades during their first year at OSU.
APPENDIX E

INSTRUCTIONS FOR CREATIVITY TASK
Creativity Task

Press the spacebar to continue

Why?

- Next quarter, we will be measuring how different environments influence people’s creativity.
- We need to know how creative people are under standard conditions

Press the spacebar to continue
Brick use task

- In the creativity task, you will be asked to list as many uses for a common brick that you can in 4 minutes.
- Each of your answers will be scored for creativity.
- The more creative each of your answers, the higher your creativity score.

Press the spacebar to continue

Brick use task

- Remember, during the next 4 minutes you should:
  - List as many uses for a brick that you can think of
  - List only creative, possible uses
  - **Do not** list impossible uses (e.g. throw to the moon) or ordinary uses (e.g. build a wall).

Press the spacebar to continue
APPENDIX F
LOGIC TASK INSTRUCTIONS
Logic Questions

Press the spacebar to continue

Logic Task

- As we said before, your assistance with these materials is very important.
- You will be given 8 minutes to complete the task.
- Find the best solution to each problem and please try to solve all the problems within the given time.

Press the spacebar to begin the task
Logic Task

- In the logic task, you will be asked to solve a logic problem. You will be given information and based on that information, will be asked to answer a question.
- You will see 5 such problems.
- Scratch paper is available on the desk in front of you.

Press the spacebar to continue
APPENDIX G

LOGIC PROBLEMS AND SOLUTIONS
Logic problems and solutions (in bold).

**Question 1**

Cindy, Andy, and Mia, were all over at Keith's house when a package was delivered. Each child guessed what was in the box, but only one of them was right. Using their guesses as clues, can you figure out what was in the box?

Cindy said, "It's a laptop computer." Andy said, "I'll bet it's a pizza." Mia said, "I think a picture or a laptop computer is in the box." "It's a picture, for sure," said Keith.

- A pizza was in the box.

**Question 2**

One of the triplets left muddy footprints all over the kitchen floor. Since all three wear the same size shoes, their mom and dad can't tell which triplet should clean up the floor. "I didn't do it," said Annie. "Danny did it," said Fanny. "Fanny is lying," said Danny. Only one of the triplets is telling the truth — the other two are lying.

Whose footprints are on the kitchen floor?

- Annie left the footprints.

**Question 3**

Five friends play together in a band. Each one plays a different instrument. The instruments they play are saxophone, trumpet, clarinet, flute, and drums. Their names are Rosa, Kim, Julie, Keith, and Lily. Can you figure out who plays the drum from the following four clues?

- Rosa plays the sax.
- Kim does not play a wind instrument.
- Julie does not play the flute or the clarinet.
- Keith's instrument is held sideways when it is played.

- Kim plays drums.

**Question 4**

Four friends left one slice of pizza in the kitchen and went into the next room to play games. During the next half hour, each friend left the room for a few minutes and then returned. At the end of the hour, all four went back into the kitchen and found that the last slice of pizza was gone.
Use the following statements to figure out who ate it. Only one of the following statements is true.

Linda: "Mike ate it."
Mike: "Olive ate it."
Ned: "Who me? Can't be."
Olive: "Mike is lying when he says I ate it."

- **Ned ate the last slice of pizza.**

**Question 5**

Ralph the dog can't remember where he buried his bone—under the rock, in the garden, under the porch, or under the tree. If only one of the following sentences is true, where is Ralph's bone?

1. The bone is under the rock.
2. The bone is in the garden or under the tree.
3. The bone is under the rock or under the porch.
4. The bone is not in the garden.

- **The bone is in the garden.**

**Question 6**

Five mice — Mindy, Marty, Muriel, Mabel, and Mike — were nibbling the cheese on the kitchen table, but Whiskers the cat chased them back into their hole. Muriel Mouse made it back third, and Mike Mouse was fourth. Mabel Mouse was after Mike, and Marty Mouse was not second. Which mouse was first, and which was last?

- **Marty Mouse was first and Mabel Mouse was last.**

**Question 8**

Each child in a family has at least 4 brothers and 2 sisters. What is the smallest number of children the family might have?

- **Thus, the smallest number of children the family might have is 8.**