THE EFFECTS OF PRIMING ON PERSONALITY SELF-REPORTS:
CHALLENGES AND OPPORTUNITIES

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THE EFFECTS OF PRIMING ON PERSONALITY SELF-REPORTS:

CHALLENGES AND OPPORTUNITIES

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Dissertation

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ABSTRACT

This study examined the impact of exposure to trait adjectives and descriptions of trait-relevant behavior on responses to a complex personality measure. A number of undergraduates were primed and then completed a measure of memory accessibility and a complex personality measure in a subsequent, ostensibly unrelated, study. Exposure to conscientiousness adjectives led to higher conscientiousness scores on the complex personality measure of conscientiousness. This effect was not seen for exposure to descriptions of conscientious behavior. The effect of primes on responses was expected to be mediated by accessibility of relevant episodic memories but no support was found for this hypothesis. Furthermore, it was expected that self-concept clarity and private self-consciousness would moderate the above results, such that those with higher self-concept clarity and those with higher private self-consciousness would demonstrate greater sensitivity to the primes but no support was found for this hypothesis.
DEDICATION

I would like to dedicate this work to all of those who gave me their time including my parents: James and Mary Nordlund; my advisor: Dr. Andrea Snell; my committee members: Dr. Robert Lord, Dr. Aaron Schmidt, Dr. James Diefendorff, and Dr. Matthew Lee; and colleagues who served as mentors, confederates, and coders: Dr. Alf Illingworth, Alison O’Malley, Drew Lam, James Beck, Adriane Bennett, Darlene Thompson, Allie Gabriel, Wendy Muller, Alycia Usher, Christina Saluan, Samantha Ritchie, Jeff Briks, Tim Jesurun, Aimee King, Chris Fluckinger, and Brodie Gregory. May I be worthy of the sacrifices of others.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>LIST OF TABLES</th>
<th>viii</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>ix</td>
</tr>
</tbody>
</table>

## CHAPTER

### I. INTRODUCTION

Personality Self-Reports .................................................................2
Primed ..............................................................................................3
Integration of the Two Literatures ..................................................4
Current Study ..................................................................................8

### II. LITERATURE REVIEW

Self-Reports are Important to IO Psychologists ...............................9
Self-Reports of Personality are Sensitive to Contextual Cues...Why? 10
A Primer on Priming ........................................................................15
Will Primes Affect Responses to Complex Personality Measures? 25
Will Behavior Primes Affect Responses to Complex Personality Measures? 32
How do Primes Affect Self-Perceptions of Personality? ..................33
Self-Concept Clarity is a Moderator .................................................61
Private Self-Consciousness is a Moderator .......................................67
Current Study ..................................................................................69
III. METHODS ........................................................................................................................................... 70
  Participants ............................................................................................................................................... 70
  Design ................................................................................................................................................... 70
  Procedure .............................................................................................................................................. 70
  Measures ............................................................................................................................................... 71
IV. RESULTS ................................................................................................................................................ 77
  Pilot Study ............................................................................................................................................... 77
  Data Screening for Main Study .............................................................................................................. 77
  Sample Characteristics .......................................................................................................................... 78
  Descriptives .......................................................................................................................................... 79
  Hypotheses Tests .................................................................................................................................... 81
  Exploratory Analyses ............................................................................................................................. 91
V. DISCUSSION ............................................................................................................................................. 96
  Behavior Primes ....................................................................................................................................... 98
  Reverse-Coded Items .............................................................................................................................. 99
  Effect Size .............................................................................................................................................. 101
  Mediation ............................................................................................................................................... 104
  Moderators ........................................................................................................................................... 107
  Use of Pronouns in Primes ..................................................................................................................... 108
  Potential Applications for Findings ....................................................................................................... 109
  Limitations ............................................................................................................................................ 112
  Ethical Considerations Concerning Deception .................................................................................... 114
  Future Research ................................................................................................................................... 115
LIST OF TABLES

Table                                           Page

4.1   Descriptive Statistics for Mediators, Moderators, and Criterion for Full Sample ....79
4.2   Descriptive Statistics by Condition .....................................................................79
4.3   Intercorrelations (Trait Prime vs. Control Condition) ......................................80
4.4   Intercorrelations (Behavior Prime vs. Control Condition) ...............................80
4.5   Test of Mediation for Primacy (Trait Prime vs. Control Condition) .................83
4.6   Test of Mediation for Frequency (Trait Prime vs. Control Condition) ...............84
4.7   Test of Mediation for Primacy (Behavior Prime vs. Control Condition) ..........86
4.8   Test of Mediation for Primacy (Behavior Prime vs. Control Condition)
         Controlling for Confound ......................................................................................87
4.9   Test of Mediation for Frequency (Behavior Prime vs. Control Condition) ..........88
4.10  Test of Mediation for Frequency (Behavior Prime vs. Control Condition)
         Controlling for Confound ......................................................................................89
4.11  Tests of Moderation .................................................................................................91
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Hypothesis 1</td>
<td>32</td>
</tr>
<tr>
<td>2.2 Hypothesis 2</td>
<td>33</td>
</tr>
<tr>
<td>2.3 Hypothesis 3</td>
<td>60</td>
</tr>
<tr>
<td>2.4 Hypothesis 4</td>
<td>60</td>
</tr>
<tr>
<td>2.5 Hypothesis 5</td>
<td>66</td>
</tr>
<tr>
<td>2.6 Hypothesis 6</td>
<td>67</td>
</tr>
<tr>
<td>2.7 Hypothesis 7</td>
<td>68</td>
</tr>
<tr>
<td>2.8 Hypothesis 8</td>
<td>68</td>
</tr>
<tr>
<td>4.1 Standardized Regression Weights for Mediation Paths (Trait Prime vs. Control)</td>
<td>85</td>
</tr>
<tr>
<td>4.2 Standardized Regression Weights for Mediation Paths (Behavior Prime vs. Control)</td>
<td>90</td>
</tr>
<tr>
<td>4.3 Standardized Regression Weights for Mediation Paths When CBDQ Contains Only Positively Coded Items (Behavior Prime vs. Control)</td>
<td>92</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Sometimes, the greatest problems are those that go unrecognized. A careful review of the available evidence from different sub-fields in psychology indicates that researchers and practitioners making use of personality tests and other self-report measures may be having their efforts hampered by priming - a phenomenon which has not been adequately appreciated in the Industrial and Organizational Psychology (IO) literature. Priming is the unintended, or automatic, increase in the accessibility of mental concepts in the presence of subtle contextual cues (primes) related to those concepts (Bargh & Chartrand, 2000). Automatic refers to a mental process which meets any of the following criteria: parallel as opposed to serial in nature, occurs outside of awareness, and/or not consciously directed (Bargh & Chartrand, 2000). Accessibility can be thought of as the degree to which a given concept is ready for use (Forster & Liberman, 2007). Priming is a topic of intense investigation in the Social Psychology literature but, here too, most researchers have not paid adequate attention to the implications of the phenomenon for personality measures. In order to fully appreciate the effects priming may have on self-report measures, and the implications of these effects, it is necessary to explore several disparate literatures. Below, what is known about personality self-reports
and priming is briefly discussed, an integration of the two literatures is explored, the implications are noted, and the current study is outlined.

Personality Self-Reports

*Personality* is “the unique organization of characteristics [patterns of thoughts, feelings, and behaviors] that define an individual and determine that person’s pattern of interaction with the environment” (Gatewood & Field, 2001, p. 601). *Personality self-reports* are measures which gather self-perceptions in order to determine an individual’s standing with regard to certain characteristics, usually in the form of personality traits (e.g. extroversion, agreeableness). These measures have been shown to predict a number of important outcomes including job performance (Hough & Ones, 2001; Ozer & Benet-Martinez, 2006), and unlike many other measures used for selection purposes, personality measures do not generally show large group (race, sex) differences and are, therefore, unlikely to result in adverse impact (Ones & Anderson, 2002). Because of these advantages, these measures are used in both research and applied settings. In fact, their use in applied settings has increased in recent years (Salgado, Viswesvaran, & Ones, 2001).

Despite these advantages, personality self-reports have long been criticized for their low criterion-related validity in selection contexts (Guion & Gottier, 1965; Murphy & Dzieweczynski, 2005; Schmitt, Gooding, Noe, & Kirsch, 1984) which has often been explained as the result of motivation among respondents to appear in a more favorable light (McFarland & Ryan, 2000; Snell, Sydell, & Lueke, 1999). A long list of remedies for improving the criterion-related validity of personality self-reports has been suggested including using subtle items (Dannenbaum & Lanyon, 1993), corrections using lie scales
corrections using response latencies (McDaniel & Timm, 1990), forced-choice formats (Christiansen, Burns, & Montgomery, 2005), option-keying (Kluger, Reilly, & Russell, 1991), required elaborations (Schmitt, Oswald, Kim, Gillespie, Ramsay, & Yoo, 2003), and warnings (Dwight & Donovan, 2003). Unfortunately, most of these methods have failed to increase criterion-related validity without introducing additional problems. The one method that has consistently led to a significant increase in validity involves frame-of-reference manipulations (Schmit, Ryan, Stierwalt, & Powell, 1995). Another method which shows promise involves the use of team-oriented instruction set (Nordlund & Snell, 2006).

Regardless of the method being discussed, most IO researchers have focused on conscious motivation, or sometimes individual differences in propensity to deceive, as the primary threat to the utility of personality measures (McFarland & Ryan, 2000; Snell et al., 1999). The thinking has been that once the faking problem was overcome, personality could become a primary method of selecting applicants. That is the case, of course, among those who feel that faking is a problem. Many researchers have dismissed the faking threat as a bogeyman which has little or no real impact in actual selection situations (Ones, Viswesvaran, & Reiss, 1996). There may, however, be another threat to the validity of personality tests, one that has received little attention in the IO literature. Priming, which will be discussed below, may present a major challenge to researchers and practitioners who use personality measures.

Priming

Primes (subtle contextual cues) have been shown to affect a number of different phenomenon including perceptions (Higgins, Rholes, & Jones, 1977), behavior (Bargh,
Chen, & Burrows, 1996), performance on cognitive tasks (Dijksterhuis & van Knippenberg, 1998), and attitudes and values (Kawakami, Dovidio, & Dijksterhuis, 2003). In one well known experiment, it was shown that exposing participants to words associated with a stereotype of the elderly (e.g. “gray”, “bingo”) as part of a lexical decision task caused them to walk slower as they left the experiment (Bargh et al., 1996). When the participants were questioned, they indicated that they were not aware of the primes and did not believe that their behavior was impacted in any way. This effect has been replicated a number of times (e.g. Hull, Slone, Meteyer, & Matthews, 2002).

It has been known for decades that primes affected perceptions of others (Higgins et al., 1977), but recent research has indicated that exposure to trait adjectives and other subtle cues in the environment can affect self-perceptions as well (Bartz & Lydon, 2004; Stapel & Koomen, 2000a, 2001; Stapel & Blanton, 2004). For example, participants who have been exposed to trait adjectives (e.g. “intelligent”, “smart”) in one task report possessing higher levels of that trait when asked about their personality in a subsequent, ostensibly unrelated, task (Stapel & Koomen, 2000a). Exposure to trait adjectives and other subtle cues can have a powerful effect on subsequent perceptions and behavior. Characteristics which are generally assumed to have a high degree of stability, such as people’s perceptions of their own personality, can be significantly altered without the intention, or even awareness, of the affected individual.

Integration of the Two Literatures

Participants in research, and job applicants in applied settings, are often put in situations where they are asked to take a personality measure in the presence of the subtle contextual cues seen in the priming literature. For example, personality tests may be
given online as part of a selection process. These measures may be completed by
respondents shortly after viewing organizational websites which include descriptions of
the working environment, as well as characteristics of current or desired employees.
Every time a respondent is exposed to a trait adjective shortly before taking a personality
test, the potential for priming exists. Something as seemingly innocuous as a job
description may also act as a prime. Other researchers have noted that integrating
selection measures and recruitment material, as often happens online, could threaten the
validity of the measure (Parish & Anderson, 2007). As usual, however, the focus has
been on faking – a conscious, volitional process. It seems likely that these cues are
problematic for an entirely different reason: priming - an automatic process that does not
involve any decision on the part of the applicant to deceive.

Priming presents a major challenge to the effective use of self-report measures.
Ironically, priming may also preset an opportunity for increasing the criterion-related
validity of self-reports. For example, some research has indicated that exposure to words
related to honesty could lead to more honest responding (Rasinski, Visser, Zagatsky, &
Rickett, 2005). This could help explain the efficacy of the team-oriented instruction set
which includes information on the benefits of accurate responses (Nordlund & Snell,
2006). Priming effects may also be partially responsible for the success of frame-of-
reference manipulations that include references to work, in either item tags or test
instructions (Schmit et al., 1995). Priming is a powerful phenomenon which can be
harnessed for the benefit of researchers and practitioners if it is properly channeled. Thus
far, IO researchers and practitioners have largely ignored this phenomenon.
The study outlined in this paper has clear implications. From an applied perspective, this research could lead to improvements in a commonly used and potentially valuable group of selection measures. From a theoretical perspective, this research will lead to a better understanding of self-perceptions, and how those perceptions are altered by cues present in the testing environment.

Thus far, priming has only been shown to affect self-perceptions of personality measured with trait adjective scales (Stapel & Koomen, 2000a) and implicit measures (Stapel & Blanton, 2004). *Trait adjective scales* consist of trait words which respondents endorse or deny a trait, or indicate on a Likert scale the degree to which the trait is true of them. *Implicit measures* are indirect measures of a construct which generally have low face validity but have demonstrated construct validity, for example, recording signature size as a measure of self-evaluation (e.g. Stapel & Blanton, 2004). In applied settings, practitioners generally rely on more complex measures (Gatewood & Field, 2001; Ones, Viswesvaran, & Dilchert, 2005). *Complex personality measures* assess aggregations of behavior over time by, for example, asking participants to rate on a Likert scale how frequently they are a few minutes late to scheduled appointments. Could primes also affect these complex personality measures? There is reason to suspect that primes will affect complex measures in the same way they affect trait adjective scales. Complex personality measures have been shown to be sensitive to other contextual cues, including frame-of-reference manipulations (Schmit et al., 1995) and team-oriented instruction sets (Nordlund, & Snell, 2006). If the priming literature is to be integrated into IO, it is important to establish that the effects observed with other types of measures generalize to those measures which are considered most important in this subfield.
We also need to better understand the process through which primes affect personality self-reports so that we can control this factor. Some researchers have suggested that self-perceptions are affected by which relevant memories happen to be most accessible at the time the judgment is made (Bem, 1967; Salancik & Conway, 1975). Research has also indicated that the accessibility of various memories can be altered by cues in the environment (Sanitioso, Kunda, & Fong, 1990). There has been a good deal of debate concerning the ability of primes to affect the salience of memories (Klein & Loftus, 1993b; Sakaki, 2007). If primes can indeed affect the accessibility of memories, this accessibility may represent an important mediator between priming and changes in self-perceptions. So, subtle cues in the environment, such as the presence of trait terms, may impact the accessibility of trait-relevant memories which may, in turn, affect trait-relevant self-perceptions as seen in responses to complex personality measures.

It is also important to note that the above process is unlikely to be uniform across people. Priming is more likely to affect some individuals than others. For example, Stapel and Koomen (2000a) found that individuals who scored low on a self-concept clarity measure did not show signs of altering their self-perceptions after exposure to trait words, unlike those who scored high on self-concept clarity. Self-concept clarity (also known as self-concept clarity) is the degree to which the self-concept is clearly and confidently defined, internally consistent, and temporally stable (Campbell, Trapnell, Heine, Katz, Lavallee, & Lehman, 1996; Stapel & Koomen, 2000a). There are a number of other individual differences which also make certain individuals more susceptible to priming including need for structure (Thompson, Roman, Moskowitz, Chaiken, and
Bargh, 1994), need for closure (Ford & Kruglanski, 1995), and private self-consciousness (Hull et al., 2002). In order to more fully understand the impact of primes on responses to complex personality measures, it is important to establish whether or not primes affect the responses of some people more than others.

The goal of this study is to examine the effects of different types of primes on personality measures commonly used in research in selection. Furthermore, this study will explore the process through which primes affect responses to personality measures.

Current Study

This study attempted to address the problems mentioned above by searching for evidence that 1) primes can affect responses to complex personality measures, 2) the accessibility of memories mediates the effect of priming on responses to complex personality measures, and 3) individual differences moderate the effect of priming on responses. This study measured pertinent individual differences (self-concept clarity, private self-consciousness) among participants, exposed them to either a trait adjective prime, a trait-relevant behavior prime, or a control prime, and observed the effects on the accessibility of relevant memories and responses to a complex personality measure.
CHAPTER II
LITERATURE REVIEW

This chapter will report research which: shows that self-reports are sensitive to contextual cues, demonstrates that primes can alter self-perceptions, suggests that primes may affect self-perceptions by making certain memories more accessible, and shows that individual differences moderate priming effects. Throughout this chapter, a model which explains how priming affects responses to complex personality measures will be constructed and hypothesis for testing the model will be offered.

Self-Reports are Important to IO Psychologists

IO psychologists use self-reports for a number of different functions. In order to measure internal constructs: attitudes, values, perceptions of the self, others and the culture and environment of an organization, it is generally necessary to use self-reports. For example, IO psychologists must ask employees about self-perceptions or perceptions of superiors and subordinates when conducting 360 degree performance appraisals. Also, employees are frequently asked to report their satisfaction or reactions to training or organizational change. It is, therefore, important to understand any potential threats to the integrity of these measures.

Self-reports of personality are of particular interest to psychologists because they have been shown to predict a number of outcomes important to IO psychologists,
including job performance, training success, and leadership (Hough & Ones, 2001; Tokar, Fischer & Subich, 1998), as well as outcomes, such as satisfaction, physical health, quality of relationships, and criminal activity, important in other subfields of psychology such as Counseling, and Forensic psychology (Ozer & Benet-Martinez, 2006).

Practitioners use personality measures in vocational counseling, training and development, and selection (Hough & Ones, 2001), and the use of personality measures in organizations has been increasing (Salgado et al., 2001).

Self-Reports of Personality are Sensitive to Contextual Cues…Why?

Self-reports of personality and interests have been shown to be sensitive to contextual cues such as role demands (Kroger, 1967) and warnings (Dwight & Donovan, 2003). Kroger (1967) found that cues in the environment, such as the title and appearance of the tester, the title of the test, and information concerning what the test was supposed to measure, affected how participants responded to the Strong Vocational Interest Battery in predictable ways.

Role demand cues.

For example, when the test administrator was wearing a military uniform, told participants that they were completing a measure concerning “what makes a good military officer”, and were given a test titled “Military Interest Questionnaire”, they gave responses more consistent with soldiers than respondents who were given the same test titled “Artistic Interest Questionnaire”, by an administrator who was dressed normally, and told they were completing a measure concerning “what makes people artistically creative”.
Warnings.

Traditional warnings, which inform applicants that dishonest responses can be identified and that responding in a dishonest manner (faking) will result in negative consequences, have also been shown to affect the way individuals respond to personality measures. The following in an example of a typical warning from (Nordlund & Snell, 2006, p.14):

**Warning**

This questionnaire contains questions that are designed to identify those who attempt to fake their responses. Research has shown that these questions are an effective way of identifying individuals who provided inaccurate information about themselves. Dishonest or distorted self-descriptions may invalidate your results. In other words, faking might result in you not being considered for the job.

Between-subjects studies that compare the mean scores of individuals who have received a warning before taking a personality test to those who have not have consistently found that warnings result in lower mean personality scores (see Dwight & Donovan, 2003 for a meta-analysis). Two other contextual cues, team-oriented instruction sets (Nordlund & Snell, 2006) and frame-of-reference manipulations (Schmit et al., 1995) have also been shown to change responses to personality measures which, in turn, lead to changes in the criterion-related validity of the measures. Various explanations of the effects of these cues have been suggested, but the process through which they alter responses has yet to be determined.

**Team-oriented instruction sets.**

Building on earlier warning research, Nordlund and Snell (2006) created team-oriented instruction sets, which included two vignettes involving fictitious individuals who had previously applied for the job (see appendix A). In the first vignette, a character
faked his way through the personality measure which caused problems for him and the team he was placed on. In the second vignette, a character responded honestly to the personality measure which resulted in positive consequences for the character and the team she was placed on. Nordlund and Snell (2006) found that the team-oriented instruction sets altered the responses participants gave to the personality measure, as seen in large differences in criterion-related validity between participants who received a standard warning and those who received the team-oriented instruction sets. The team-oriented instruction sets may have led participants to make a conscious effort to respond in a more honest manner. Alternatively, it is possible that the vignettes in the team-oriented instruction sets automatically increased the accessibility of the concept of honesty and led to more honest responding, without participants being aware of the fact that their responses were affected.

*Frame-of-reference manipulations.*

Altering the frame-of-reference applicants use to answer personality items, by either altering the instructions or altering the items, changes the way people respond to personality measures. Schmit et al., (1995) altered a pre-existing complex personality measure by adding “at work” tags to the end of the items (e.g. “I try to be courteous to everyone I meet” became “I try to be courteous to everyone I meet at work”) or making other minor alterations. In one study, participants were randomly assigned to take either the standard or context-specific version, and the means were significantly different across conditions. Another version of the personality measure, in which school was made the frame of reference, was created for use in a second study. Once again, participants were randomly assigned to take either the specific version or the standard version. In this
study, the school-specific version not only had different mean scores than the standard version, it also had higher criterion-related validity. Bing, Whanger, Davison, and VanHook (2004) also found that a context-specific version of a personality measure had higher criterion-related validity. Holtz, Ployhart, and Dominguez (2005) found that a context-specific version had different means and less error variance than a standard version.

Hunthausen, Truxillo, Bauer, and Hammer (2003) also altered frame-of-reference, but instead of altering the items on a personality measure, they altered the instructions by adding a portion that told respondents to think about how they behave at work when answering the questions (see also Degroot & Kluemper, 2007). Job incumbents were randomly assigned to take either the specific or general version of the test. Those given these context-specific instructions answered the question differently than those given the original instructions, just as participants in previous studies had responded differently to the context-specific items. Once again, the criterion-related validity of the context-specific version was higher.

Researchers have suggested two main reasons for the efficacy of frame-of-reference instructions (Schmit et al., 1995). First, the frame-of-reference instructions may increase the face-validity of the personality items. Research has indicated that personality items higher in face validity generally have higher criterion-related validity (Duff, 1965; McCall, 1958; Weed, Ben-Porath, Butcher, 1990; Wrobel & Lacher, 1982). Second, the frame-of-reference instructions may be reducing measurement error by insuring that all respondents are interpreting the items in a similar way, at least with regard to context.
Furthermore, it has been suggested that behavior is more consistent in specific situations than across situations grouped under a broad trait (Mischel & Peake, 1982; Mischel & Shoda, 1995). In other words, behavior is consistent across time, but not necessarily across situations. For example, an individual may be consistently outgoing at parties but also consistently reserved at work. Thus, scores on personality measures that assess behavior in a specific context (e.g. at work) may be better than broad personality measures at predicting future behavior in that particular context.

Adding phrases like “at work” to the items or instructions may cause individuals to engage in a conscious attempt to focus on work-related thoughts, feelings, and behaviors. An alternative explanation is that mentioning work automatically activates work-related memories, and that no conscious volition is necessary. It is possible that exposure to work-related terms would have the same effect on responses regardless of whether they appeared in the test instructions, the items, or in a newspaper article that the respondent happened to be reading before completing the personality measure. At this point, it is impossible to say with any certainty whether or not mere exposure to work-related words would have the same effect as explicit changes to instructions or items.

What reason is there for supposing that contextual cues might be affecting responses to personality measures through automatic processes? As will be explained below, contextual cues have been shown to affect a number of important outcomes without the awareness of the affected individual. This research leads us to believe that some of the effects of contextual cues on personality self-reports, which have traditionally been explained in terms of conscious processes, may, in fact, be due to priming effects. Understanding the process through which contextual cues affect
responses to personality measures could have major implications for the way those measures are used by both researchers and practitioners.

A Primer on Priming

*Priming* is the unintended, or automatic, increase in the accessibility of mental concepts in the presence of subtle contextual cues (primes) related to those concepts (Bargh & Chartrand, 2000). Among social psychologists, the term priming indicates that the perceiver is unaware of the relationship between the cue being presented and the dependent variable being measured (Bargh & Chartrand, 2000). This leads researchers in social psychology to go to great lengths to disguise any connection between the prime and outcome of interest. Also, participants in these studies are usually probed for awareness after the dependent variable is collected, and those who indicate suspicion are removed from the study. In cognitive psychology, the term priming may refer to situations where the perceiver is aware of a connection between the cue and the dependent variable (e.g. Neely, 1977; Sakaki, 2007). This paper will use the definition of priming favored by social psychologists unless otherwise noted.

*Types of primes.*

A number of different kinds of primes have been studied and they can be loosely grouped into 7 types. The seminal priming article in social psychology was Higgins et al. (1977). In this study, participants were primed with various personality trait adjectives that were applicable to an ambiguous character in a story subsequently read by the participants in an ostensibly unrelated task. When participants were asked to describe the character, they tended to use the primed concepts. For example, individuals exposed to trait adjectives related to the concept “adventurous” were likely to see a character that
climbed Mt. McKinly, shot the Colorado rapids in a kayak, and drove in a demolition derby as an adventurous person. Those who were primed with the concept “reckless” were likely to interpret the same individual as reckless. Similar results were found when participants were primed with descriptions of trait-relevant behaviors (e.g. “break his arm” for hostile or “hug the boy” for kind) (Srull & Wyer, 1979, 1980). Actual behaviors performed in the presence of a participant may lead to mimicry and, thus, also act as primes (Chartrand & Bargh, 1999). For example, when confederates smiled, rubbed their faces, or shook their feet during an interaction with a participant, participants also smiled, rubbed their faces, or shook their feet.

Researchers have also found that it is possible to prime stereotypes. Bargh et al. (1996) primed an elderly stereotype by exposing participants to words traditionally associated with that group (e.g. “old”, “grey”, “wrinkle”, “Florida”, “bingo” for an elderly stereotype). Stereotypes have also been primed using photographs of group members (Chen & Bargh, 1997), or by having participants imagine and/or write about the daily life of group members (Wheeler, Jarvis, & Petty, 2001).

A type of prime that has very different sorts of effects, as discussed below, are exemplar primes. An exemplar prime is when a particular person, who is known to possess certain characteristics, is primed, as opposed to a group. For example, one could prime the stereotype of professor by asking participants to imagine a professor and list his/her typical behaviors, lifestyle, and appearance. On the other hand, one could prime an exemplar, Albert Einstein, by asking participants to imagine Einstein and list his typical behaviors etc. (Dijksterhuis, Spears, Postmes, Stapel, Koomen, van Knippenberg, & Scheepers, 1998). Other important types of primes include goal terms
(e.g. “compete”, “succeed”, “master”) (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel, 2001) and pronouns (“I” vs. “we”) or descriptions of behavior associated with *collectivism vs. individualism* (Gardner, Gabriel & Lee, 1999).

*Types of outcomes.*

So, what outcomes do these primes influence? Although primes are, by their very nature, subtle manipulations, they have been shown to have robust effects on a number of different outcomes. Early research demonstrated that primes affect *perceptions of others* (e.g. Higgins et al., 1977). Primes have also been shown to influence *memory* for relevant facts about, and behaviors performed by, others (Skowronski, Carlston, & Isham, 1993, although see Higgins et al., 1977). For example, Skowronski et al. (1993) exposed some participants to adjectives indicative of a lack of intelligence (e.g. “retarded”, “stupid”, “witless”, “slow”) and others to neutral words. Participants then read a story about a character which contained a number of facts and behaviors that were congruent with the primed trait, unintelligent, and a number of facts and behaviors that were incongruent with the primed trait. After reading the story and completing an intervening task, participants were asked to recall everything they could about the character in the story. Participants who had been primed with unintelligent adjectives were more likely to recall facts and behaviors indicative of a lack of intelligence than participants who had not been primed.

A number of studies have also shown primes can alter *behavior*. Perhaps the most famous are a series of studies conducted by Bargh et al. (1996). In their first study, participants were primed with words related to either the concept rude or the concept polite and were then confronted with a situation in which they needed to interrupt a
conversation between the experimenter and a confederate in order to complete a task. Individuals who had been primed with the concept rude were more likely to interrupt the conversation, and did so sooner, than participants primed with the concept polite. In the second experiment, participants were either primed or not primed with words related to an elderly stereotype (e.g. “old”, “retired”, “grey”) and were then secretly timed as they walked down a section of hallway leading away from the experiment. Individuals who were primed with an elderly stereotype walked slower than individuals who were not. In the third study, participants were primed with racial stereotypes using photos of either African-American faces or Caucasian faces and were then placed in a frustrating situation. Individuals who had been primed with the African-American faces demonstrated greater hostility, as rated by judges blind to condition, then those primed with Caucasian faces. The link between primes and behavior has been seen a number of times using a variety of different primes and behaviors (see Bargh & Chartrand, 1999; Wheeler & Petty, 2001 for reviews).

A number of different primes have been shown to affect performance on cognitive tasks. Dijksterhuis et al. (1998) recruited participants for two ostensibly unrelated studies. In the first study, participants were primed with job stereotypes by being asked to imagine a professor or a supermodel and then list typical behaviors, lifestyle, and appearance attributes of the target. In the second study, participants completed a general knowledge test. Those who had been primed with the professor stereotype performed better than those who had been primed with the supermodel stereotype. Dijksterhuis and van Knippenberg (1998) found similar results when priming professor vs. soccer
hooligan or when priming the trait intelligent vs. stupid (see also Bargh et al., 2001; Dijksterhuis, Aarts, Bargh, & van Knippenberg, 2000; Hull et al., 2002).

Priming has been shown to influence affect and the accessibility of attitudes. A number of studies have shown that presenting an attitude object increases the accessibility of associated attitudes (see Fazio, 2001 for a review). For example, exposing someone to a picture of a cockroach increases the accessibility of the concept “disgusting” allowing individuals to process this word faster (but only for a short time after the prime – less than a second) than if they had been exposed to a picture of a kitten or if they had not been exposed to anything at all. The increased accessibility of attitudes can also affect subsequent perception and judgment.

Priming has also been shown to influence self-reports of attitudes and values. For example, Brewer and Gardner (1996) had participants read a story about a trip to the city and circle all of the pronouns in the text of the story. In one condition, the collective self was primed by using first-person pronouns (e.g. “we” and “us”); in another condition the pronouns used were third-person (e.g. “they” or “them”). Participants were then asked to judge how similar their own attitudes were to a number of statements on various issues (e.g. “abortion should be available to victims of rape”). Those primed with the collectivist pronouns judged the statements as more similar to their own attitudes than those who received control primes. Additionally, for those attitudes that were ultimately judged as dissimilar, participants primed with collective pronouns took longer to make a response.

Kawakami et al. (2003) demonstrated that priming a stereotype led individuals to self-report attitudes which were consistent with that stereotype. In one study, participants were first presented with a photograph of an elderly person or a young person and asked
to describe the person for 5 minutes. They were then asked to indicate their agreement with a number of attitude statements that previous research had indicated were commonly associated with the elderly (e.g. there is too much sex and nudity on TV). Participants primed with an elderly photograph showed higher endorsement of the elderly-attitude items than participants primed with a young-person stereotype. In another study, participants primed with a skinhead stereotype reported more prejudice than participants who received no prime. Similar results were found by Gardner et al. (1999), who reported that priming the concept interdependence (with a story about an interdependent, as opposed to independent, character, or by exposing participants to interdependent: “we”, “ours”, as opposed to independent: “I” “mine”, pronouns) increased self-reported collectivist values (see also Trafimow, Silverman, Fan, & Law, 1997; Trafimow, Triandis, & Goto, 1991; Ybarra & Trafimow, 1998).

Most pertinent to this study, recent research has indicated that that priming can alter self-reports of personality (Bartz & Lydon, 2004; Stapel & Blanton, 2004; Stapel & Koomen, 2001). For example, Stapel and Koomen (2000a) found that participants exposed to trait terms indicative of intelligence (e.g. “intelligent”, “smart”) in one task rated themselves higher on semantically similar trait terms (e.g. “bright”) in an subsequent and ostensibly unrelated task than participants who had been exposed to trait terms indicative of a lack of intelligence (e.g. “stupid”, “dumb”). Primes have also been shown to alter responses to implicit measures of personality (Dijksterhuis et al., 1998; Stapel & Blanton, 2004). For example, Stapel & Blanton (2004) subliminally primed participants with a photograph of a beautiful woman which increased the speed with which participants responded to words associated with a lack of attractiveness (e.g.
“ugly”, “unattractive”) in a lexical decision task when those words were preceded by subliminal presentation of self words (e.g. “I”, “me”). So, the presentation of a subliminal photograph affected how attractive people perceived themselves to be (in this case exposure to a picture of an attractive person caused people to see themselves as less attractive – a contrast effect, see below).

Types of effects.

Primes can have one of three types of effects: assimilation, contrast or no effect. Most of the examples discussed thus far have been examples of assimilation, where an individual perceives in others or themselves, or acts in accordance with, a primed construct. When primes result in contrast effects, individuals perceive or act in a manner that is the opposite of the prime. For example, Dijksterhuis et al. (1998) found that participants primed with the stereotype for professor scored higher on a test of general knowledge – an assimilation effect, while participants primed with an exemplar (“Albert Einstein”) of a professor scored lower- a contrast effect.

There appear to be two main processes by which a prime may cause contrast effects. First, if a prime is blatant and/or consciously recalled at the time the DV is being measured participants may attempt to correct for the unwanted influence of the prime and may overcompensate (see Forster & Liberman, 2007 for a discussion). For example, Lombardi, Higgins, and Bargh, (1987) exposed participants to trait words synonymous with stubborn (e.g. “obstinate”) as part of a lexical decision task and then had them rate the stubbornness of an ambiguous character in an ostensibly unrelated second task. Those participants that could recall the prime words after the second task, indicating that the primes were consciously available when judgments were made, rated the character as
less stubborn; those who could not recall the prime words rated the individual as more stubborn. As a prime becomes less subtle, more participants are likely to consciously recall the prime when the outcome is measured. If the prime is also perceived as something which could influence the outcome, the individual attempts to correct for the unwanted influence of the prime, often leading to overcompensation, which results in contrast effects.

The other leading cause of contrast effects is when an exemplar is primed (e.g. Dijksterhuis et al., 1998). This seems to occur because people compare themselves to the exemplar, and if the exemplar is extreme with regard to the trait in question (Herr, 1986), people see themselves, or other ambiguous targets, as inferior with regard to the trait, and act accordingly. So, when “Einstein” is the prime, people compare themselves to Einstein and think ‘Einstein is very smart - compared to Einstein, I am stupid.’ People then tend to see themselves as less intelligent in an absolute sense and to act in a less intelligent manner. The present study will be dealing with subtle primes that do not involve exemplars. Therefore, we are unlikely to see contrast effects.

Primes can also have no effect. From the very beginning, it has been evident that priming only had effects on some outcomes, in some situations. For example, it has repeatedly been found that if a trait term prime is not applicable to a target, then the prime will not affect perceptions of that target (e.g. Higgins et al., 1977; Sedikides, 1990; although see Stapel & Koomen, 2000b for evidence that extremity and breadth can compensate for low applicability). So, if an individual is exposed to the word “reckless” and then reads a story about a character that sailed across the Atlantic alone, they may rate that character as more reckless, but if they are exposed to the term “thrifty” and this
trait bears no relation to information available about the target, it is unlikely to influence impressions. Similarly, Dijksterhuis, Spears, and Lepinasse (2001) found that increasing accuracy motivation mitigated the effect of primes. For example, when participants were exposed to information about a number of people and were then asked to rate the group on a number of traits, they rated the group in a way that was more consistent with stereotypes of the elderly if photos of elderly individuals accompanied the descriptions than if pictures of young individuals accompanied the descriptions, unless they were given motivation to be accurate in their impressions, in which case the photos did not affect the trait ratings. Thompson et al. (1994) found similar results with regard to accuracy motivation, with the caveat that individuals must have adequate cognitive resources and memory of the target information if the goal is engaged after the target has been encoded.

**Moderators.**

There are a number of moderators of priming effects. For example, Herr (1986) found that when participants were primed with extreme exemplars of a trait (e.g. “Hitler” for the trait hostile), they showed contrast effects in terms of their perceptions of others and in behavior in a prisoners’ dilemma game, but when participants were primed with moderate exemplars (e.g. “Joe Frazier” for the trait hostile), they showed assimilation effects. So, in this case, the extremity of the prime moderated the effect it had. A number of other moderators have been identified including the subtlety (Martin, 1986), frequency (Bargh & Peitromonaco, 1982), recency (Higgins, Bargh, & Lombardi, 1985), and applicability (Higgins et al., 1977) of the prime. A number of individual differences have also been shown to moderate priming effects such as self-monitoring (DeMarree,
Wheeler, & Petty, 2005) private self-consciousness (Hull et al., 2002), self-concept clarity (Stapel & Koomen, 2000a), need for structure (Thompson et al., 1994), and need for closure (Ford & Kruglanski, 1995). The degree of self-activation (Stapel & Koomen, 2001), self-focus (Dijksterhuis & Van Knippenberg, 2000), and self-certainty (Stapel & Blanton, 2004) caused by various types of manipulations have been shown to moderate priming effects. The goals and motivation of an individual have also been shown to moderate priming (Dijksterhuis et al., 2001; Sedikides, 1990; Thompson et al., 1994). A number of three-way and occasional four-way interactions have been identified, whereby moderators are themselves moderated by other variables and so on (Lombardi, et al., 1987; Thompson et al., 1994; Stapel & Koomen 2001).

In summary, priming effects depend on the combination of 1) the type of prime, 2) the type of outcome, and 3) the presence of moderators. These factors can produce assimilation, contrast, or lead to no effect. The literature on priming is large and expanding, and generalization is difficult because there seem to be so many exceptions to any proposed rules. Because of the complexity of the priming phenomenon, it is useful to concentrate on specific relationships.

Variables of particular interest.

This study is primarily concerned with the effects of exposure to trait adjectives and descriptions of trait-relevant behaviors on self-perceptions of personality as measured by a complex personality measure. The effect of primes on self-reports of personality is particularly important for applied psychologists. Trait terms and behavioral descriptions are commonly encountered in the environment, and applicants may be exposed to these primes shortly before they complete a personality measure. For example, applicants
completing an online personality measure may encounter trait adjectives on a website which describe the working environment as “friendly” or the organization as having a culture that rewards employees who are “innovative and enterprising”. Applicants are also likely to encounter job descriptions that include task statements, such as “completes projects by deadlines” or “greets customers” which are relevant to traits, such as conscientiousness or extroversion, typically measured by personality inventories. This paper will limit the examination of moderators to two specific individual differences: self-concept clarity and private self-consciousness. When it comes to moderators, the primary aim of this paper is merely to demonstrate that primes have a stronger effect on responses to a complex personality measures for some people than they do for others. In order to achieve this aim, it is unnecessary to measure all of variables that have been shown to moderate priming effects. Self-concept clarity was chosen because a valid and reliable measure of this variable exists and it has been shown to moderate the effects of priming on responses to a personality measure in the past (Stapel & Koomen, 2000a). Private self-consciousness was chosen because it has been shown to moderate the effects of priming on numerous dependant variables (Hull et al., 2002).

Will Primes Affect Responses to Complex Personality Measures?

Up to this point, all of the studies which have shown that priming can affect explicit self-reports of personality (Bartz & Lydon, 2004; Stapel & Blanton, 2004; Stapel & Koomen, 2000a, 2001) have assessed self-perceptions with trait adjective scales. In these scales, respondents are confronted with a trait term (e.g. “extroversion”) and asked whether or not, or to what degree, the trait can be applied to them. Alternatively, the respondent is asked to choose which of two semantically opposite traits are most
applicable to them. Unlike the measures used in the studies above, most contemporary personality measures assess traits with items which ask respondents to what degree they endorse statements about specific trait-relevant thoughts, feelings, and behaviors (e.g. “I return library books on time”) (Gatewood & Field, 2001; Ones et al., 2005). It is most important to understand whether or not primes affect responses to complex personality measures because these are the measures on which most researchers and practitioners rely (Hogan, 2005; Ones et al., 2005).

Stapel and Koomen, (2000a) argued that the effects observed on trait adjective scales also should be seen on other scales. In one study, they demonstrated that primes affect responses to items that assess self-perceptions by asking respondents to predict future behavior. In the first item, respondents were told about a fictional game that required a high level of intelligence. They were told how many points the average person scored, and were asked to predict how many points they would score. In the second item, which was somewhat similar in nature to situational judgment items, the respondent was presented with a scenario and asked to choose from among several possible courses of action which were indicative of different levels of intelligence/expertise in a certain domain. Participants exposed to primes that activated intelligence thought they would score more points and chose a response that was more indicative of intelligence/expertise than participants exposed to a prime which activated the concept unintelligent. This study demonstrates that primes generalize to at least some other measures of self-perception. Also, recall that priming has been shown to affect implicit measures of personality (e.g. Stapel & Blanton, 2004).
It would be a mistake to assume, however, that responses to complex personality measures are also sensitive to primes. The items in complex measures are much more specific, and responses to these items may be less sensitive to primes because these items are less ambiguous than trait adjective items (John & Srivastava, 1999). Research indicates that a wide variety of behaviors may be linked to a given trait term (Kunda, Sinclair, & Griffin, 1997). Items on complex personality measures, on the other hand, involve self reports of specific thoughts, feelings and behaviors. Memories relevant to specific thoughts, feelings, and behaviors are likely to be more consistent than the larger pool of memories relevant to a trait term for two reasons. First, there will be fewer memories relevant to specific thoughts, feelings, and behaviors than broad trait terms. Second, behavior (and thus memories of the behavior) is more consistent in specific situations than across situations grouped under the same broad trait (Mischel & Peake, 1982; Mischel & Schoda, 1995). If memories about specific situations are more consistent, they may be less sensitive to contextual cues (see discussion of Kunda, Fong, Sanitioso, & Reber, 1993 below). If memories related to the item are unaffected, responses to the item may also be unaffected. So, there is some reason to believe that complex personality measures may be insulated from the effects of primes because they are more specific than trait adjective measures.

As mentioned above, however, there is evidence that self-perceptions of personality assessed with complex personality measures are malleable. Team-oriented instruction sets (Nordlund & Snell, 2006) and frame-of-reference manipulations (Schmit et al., 1995) have been shown to alter responses to complex personality measures. There is reason to suspect that these techniques may work by priming certain concepts. Recall
that the team-oriented instruction sets included the use of vignettes which participants read before completing the personality measure. The second of the two vignettes described an applicant who chose to fill out a questionnaire honestly. Previous research has shown that exposing individuals to examples of behavior can impact behavioral intentions (Anderson, 1983; Trafimow & Borrie, 1999). It is possible that having participants read about someone responding honestly on a personality measure primed the concept of honesty and the specific behavior of responding honestly on a personality measure.

Other research has shown that respondents can be induced to be more candid through exposure to words associated with honesty. Rasinski et al. (2005) recruited participants for two ostensibly unrelated studies. In the first study, participants completed a lexical decision task. In one condition, some of the words in the lexical decision task were related to honesty (e.g. “open”, “sincere”, “truthful”); in the other condition, all of the words were neutral. Participants were then asked to complete a survey on alcohol use. Those primed with honesty adjectives reported more socially undesirable behaviors (e.g. binge drinking, missed classes due to drinking, blackouts). These behaviors are routinely underreported, and the authors argued that responses given by those who received the honesty prime better reflected reality. This suggests that activating the concept of honesty may lead to more honest behavior. It’s possible that the second vignette in the Nordlund and Snell (2006) study also acted to prime the concept of honesty which, in turn, led to more honest responding.

Another relevant study, reported by Rimland (1962), found that when participants were instructed to fake on a personality measure and were then asked to candidly report
their attitudes about faking personality tests in real world situations, they indicated that they would be more likely to respond dishonestly. One could interpret these results in terms of cognitive dissonance; applicants engaged in an unfavorable behavior, and this caused their attitude towards the behavior to be more favorable. Rimland (1962), however, argued that the instructions, as opposed to the subsequent behavior, were influencing self-perceptions. Specifically, he argued that the results were due to “a ‘carry-over effect’ in that students asked to respond frankly apparently tend to perceive themselves as being candid… Students asked to fake appear to perceive themselves as somewhat more likely to fake under operational circumstances” (p. 749). Rimland (1962) went on to argue that these results demonstrated “the effects of suggestion upon the students’ self-perceptions, and it implies that great care should be exercised in wording test instructions” (p.750-751). In a similar manner, reading a vignette in which an applicant gives honest responses on a personality measure may make the concepts of honesty and forthrightness more accessible in the mind of the participants which, in turn, causes participants to respond more honestly.

Priming research has repeatedly demonstrated that exposure to certain words and phrases are capable of altering self-perceptions without the awareness of the perceiver (Stapel & Koomen, 2000a, Stapel & Blanton, 2004). Recall that the frame-of-reference manipulations primarily consisted of adding “at work” tags to items or instructions. These words might also be having automatic priming effects on self-perceptions by making certain memories (in this case, memories relevant to a work context) more accessible.
Based on the available data, it’s impossible to say whether the team-oriented instruction sets, or the frame-of-reference manipulations, changed responses through conscious or automatic processes. These techniques are relatively blatant, and studies examining their effects have not generally attempted to determine whether or not applicants were aware of the connection between the manipulations and their responses. Therefore, these studies do not necessarily demonstrate that priming is capable of changing responses to complex measures. These studies do, however, demonstrate that complex personality measures are sensitive to some kinds of contextual cues, which suggests they may also be sensitive to primes.

In another relevant study, Mussweiler and Bodenhausen (2002) indicated that exposure to members of in-groups and out-groups could affect responses to the types of questions seen on complex personality measures. In one of a series of studies, male undergraduates read a story about either a very caring female or a very caring male. They were then asked to rate their own level of caring and respond to a number of questions related to caring behavior (e.g. “What percentage of your friends come to you with their personal problems?”). Those participants who read the story about the caring male rated themselves as more caring on both the trait adjective scale and the more complex questions than those who read the story about the caring female. This isn’t necessarily a priming study because little or no effort was made to disguise the connection between the manipulation and the dependent variable and there was no check for suspicion. This study does, however, provide further demonstration that responses to complex items are susceptible to contextual cues. The authors of the study were led to conclude that “conceptions of the self are greatly dynamic and malleable. How one
primarily thinks of oneself in a given situation critically depends on what knowledge about the self is brought to mind in this situation” (Musswieler & Bodenhausen, 2002, p. 30).

Research on item placement (often grouped under the umbrella term “context effects”) also indicates that responses on complex personality measures can be affected by contextual cues. Specifically, this research indicates that responding to one question may influence responses to subsequent questions (Knowles, 1988). This leads to items at the end of measures being more polarized and reliable than similar items that appear at the beginning of a measure. Context effects have also been found when measuring attitudes, intentions, and beliefs (Feldman & Lynch, 1988; Tourangeau & Rasinski, 1988). Researchers have suggested that one question may act as a contextual cue that makes certain concepts more accessible which, in turn, affects responses to subsequent questions relevant to the accessible concept (Feldman & Lynch, 1988). These researchers did note, however, that each individual has a subset of core beliefs and attitudes (central values) that are stored in long-term memory and that these core concepts are unlikely to be influenced by contextual cues (Feldman & Lynch, 1988). Core concepts are thought to be stable and internally consistent, whereas other attitudes and beliefs are more ambiguous (Tourangeau & Rasinski, 1988). Core concepts are thought to be limited in number, however, and most beliefs and attitudes that a person might be asked to report are computed on the spot based on relevant accessible information.

The available evidence indicates that trait adjective primes are capable of influencing trait adjective personality measures. Complex personality measures, while
differing from trait adjective scales in important ways, are also susceptible to various contextual cues. In light of the available evidence, the following hypothesis was proposed:

H1. Exposure to conscientiousness trait adjectives will increase scores on the complex personality measure of conscientiousness.

Figure 2.1 Hypothesis 1

Will Behavior Primes Affect Responses to Complex Personality Measures?

Studies that have examined the effect of primes on self-perceptions of personality have examined the impact of trait adjectives (e.g. “smart”) and exemplars (e.g. “Einstein”) (Stapel & Blanton, 2004; Stapel & Koomen, 2000a, 2001). They have not, however, examined the impact of descriptions of trait-relevant behavior not linked to some specific individual (e.g. “complete the work”, “lead the team”). These types of behavioral descriptions are likely to appear in job descriptions, which applicants may be exposed to shortly before taking personality measures. This may be particularly true in online selection contexts (Parish & Anderson, 2007). It is, therefore, important to know whether these phrases act as primes. A number of studies have found that that exposure to trait-relevant behaviors automatically activates trait concepts in a process termed *spontaneous trait inferences* (see Newman & Uleman, 1993; Uleman, Newman, &
Moskowitz, 1996 for reviews). Evidence indicates that this process occurs at the encoding stage (Uleman, Hon, Roman, & Moskowitz, 1996). Researchers have suggested that exposure to trait-relevant behaviors is likely to have the same priming effect as exposure to trait adjectives because of spontaneous trait inferences (Newman & Uleman, 1993; Uleman et al., 1996).

Studies on impression formation indicate that exposure to descriptions of trait-relevant behaviors tends to alter perceptions of the personality of others in the same way that exposure to trait terms does (Srull & Wyer, 1979, 1980). As Srull and Wyer (1979) argued “to the extent that trait and behavioral concepts are interrelated in memory…the accessibility of trait concepts may also be increased by priming specific behaviors that exemplify these trait concepts” (p. 1661). This suggests that exposure to descriptions of trait-relevant behavior may prime self-perceptions of personality.

H2. Exposure to descriptions of behaviors indicative of conscientiousness will increase scores on the complex personality measure of conscientiousness.

Figure 2.2 Hypothesis 2

How do Primes Affect Self-Perceptions of Personality?

Some have argued that many priming effects can be explained in terms of a change in the self-concept. According to this active-self account, primes temporarily
alter self-perceptions, and this is what causes changes in behavior and cognition (DeMarree et al., 2005). Put in bolder terms, priming can create “a new identity” (DeMarree et al., 2005, p. 657). Two different processes, through which primes might alter self-perceptions, have been suggested as part of the active-self account. According to the biased activation model, primes activate prime-consistent content, already stored within the self-concept of an individual. According to the expansion model, primes activate concepts which are misattributed to the self and are, thereby, incorporated into the self-concept, regardless of whether or not prime-consistent content already existed there.

To put these two mechanisms in more concrete terms, imagine that an individual is exposed to the word “efficient”, which then becomes tied to the concept of the self, activating the self-concept: ‘I am efficient’. This would be expected to lead to more efficient behavior, among other things. According to the biased activation model, this would happen because activating the concept ‘efficient’ would make those parts of the existing self-concept that were related to ‘efficient’ more accessible while making parts of the existing self-concept at odds with ‘efficient’ less accessible. So, when they are asked about their own efficiency, individuals are likely to see themselves as more efficient. DeMarree et al. (2005) are not clear about whether or not episodic memories of trait-relevant behavior are a part of the self-concept that would become more accessible when that trait is primed, but this would seem consistent with the biased activation model.

According to the expansion model, when the concept ‘efficient’ is activated, the individual misattributes the source of this concept as internal and, therefore, reflective of
the self even if the individual has never exhibited efficient behaviors or thought of themselves as efficient. In this model, existing self-concepts are not important; the new concept becomes integrated into the individual’s identity regardless of preexisting self-perceptions. Thus, episodic memories would seem to be irrelevant to the expansion model.

As will be discussed below, available evidence suggests that the biased activation model may provide the best framework for explaining the effect of primes on self-perceptions. Specifically, primes may increase the accessibility of relevant memories, which, in turn, alter self-conceptions. In order to understand why primes might affect self-perceptions by affecting the accessibility of relevant memories, it is helpful to begin by noting research that, until recently, seemed to indicate that primes should not affect self-perceptions.

*Primes affect perceptions of ambiguous targets.*

It has long been known that primes affect perceptions of the personality of others. Despite this research, it was, for some time, doubted that primes could affect self-perceptions of personality. While Higgins et al. (1977) remarked that “[g]iven that category accessibility can affect how a person characterizes another person, it may also affect how a person characterizes his or her own behavior and internal processes” (p. 152), they also argued that primes were more likely to influence perceptions when the target was ambiguous. Over time, the concept of ambiguity came to be associated with the degree to which the target was well-known to the perceiver. Evidence indicated that primes were more likely to influence perceptions of little-known others. Most early priming studies used a fictitious character that participants were encountering for the first
time as the target. In one of the few exceptions, Stapel, Koomen, and Van Der Pligt (1997) primed participants with trait terms related to hostility or friendliness and then had them rate an ambiguous character in a story and a good friend on several personality traits, including hostility. Participants rated the ambiguous character as more hostile when they had been primed with hostile trait adjectives than when they had been primed with friendly trait terms. This effect was not seen for ratings of a close friend. The authors concluded that “judgments of well-known targets remain unaffected by trait concept priming” (Stapel et al., 1997, p. 58). It was suggested that perceptions of well-known others are less sensitive to primes because well-known others are less ambiguous. People have had the opportunity to observe well-known individuals in a number of situations and have already formed a perception of them. This perception is assumed to be stable and not sensitive to subtle cues in the environment.

Similar arguments could be made about the self. Clearly, we know ourselves better than we know anyone else. If well-known targets are unambiguous targets, the self must be completely unambiguous. If primes only affect perceptions of ambiguous targets, it follows that primes could not affect perceptions of the self. Yet primes do affect self-perceptions (Stapel & Koomen, 2001). Ironically, some research has shown that it is actually easier to alter self-perceptions than perceptions of others (Kawakami et al., 2003; Stapel & Blanton, 2004). How is this possible? A number of studies on self-perception help resolve this apparent contradiction by suggesting that although the self is well-known, it is also ambiguous.
Self-perceptions of personality are ambiguous.

Nisbett, Caputo, Legant, and Marecek (1973) had participants rate themselves and a number of others on a series of traits. Participants were allowed to choose one of two polar opposite traits (e.g. “energetic – relaxed”) or to indicate that their behavior “depends on the situation”. Participants were much more likely to choose the “depends on the situation” option for themselves than for others, indicating that they felt their personality was variable and difficult to classify, at least compared to the personality of others.

In a similar study by Sande, Goethals, and Radloff (1988), participants were given a series of bipolar trait pairs and asked to rate themselves and another person. Participants were asked to choose one of the traits or indicate that “both” or “neither” of the traits described them. Participants often indicated that both traits on the bipolar scale described them, and they were more likely to indicate “both” for themselves than for others. Once again, individuals seemed to perceive their own personality as variable and ambiguous.

Another study reported by Nisbett et al. (1973) helps to explain why participants see themselves as ambiguous with regard to trait descriptions. In this study, participants were asked to volunteer, and then, both he/she (the actor) and an observer were asked how likely it was that the actor would volunteer in the future. Observers expected future volunteering behavior to be consistent with the behavior just witnessed; when the actor volunteered, observers were more likely to expect volunteering behavior in the future than if the actor had not volunteered. Actors did not assume that their future behavior would be consistent with their present behavior; actors who volunteered were no more
likely to indicate that they would volunteer in the future than actors who had not volunteered. Individuals seem to see their own behavior as less consistent than the behavior of others. Why do individuals perceive their own behavior as being less consistent?

_Individuals infer their dispositions from salient memories._

One of the reasons people may see their own behavior as inconsistent is that they have memories of themselves acting in a manner consistent with both traits on a bipolar scale. Each individual is likely able to recall some incidents in which he/she acted in an extroverted manner and other incidents in which he/she behaved like an introvert. I may remember how gregarious I was at the party last weekend and how I struck up a conversation with someone in the elevator this morning, on the one hand, and remember how I declined to go out with my friends last night and how I was flustered and tongue-tied when I had to make a presentation, on the other hand.

Individuals may infer their internal states by searching available memories for relevant evidence. When asked if I hold a favorable attitude towards something, I search available memories for situations in which I displayed behavior relevant to that attitude, and I then infer whether my behavior has been consistent or inconsistent with that attitude (Bem, 1967). Essentially, I infer my own attitudes in the same way I would infer the attitudes of some other person.

Similar processes may be at work when people are asked about their personality traits. If I am asked whether or not I am extroverted, and I search available memories and find that I was extroverted on some occasions but introverted on others, I may perceive myself as ambiguous with regard to that trait. If I am allowed to indicate that
my personality depends on the situation, or that I am both extroverted and introverted, I will do so. If forced to choose one trait, as is usually the case, I may base my self-perceptions on whichever memories happen to be the most salient, or accessible, at the time I am making the judgment (Salancik & Conway, 1975). As Srull and Wyer (1979) argued, “when individuals are asked to judge themselves or another person, they are unlikely to perform an exhaustive search of memory for all cognitions that have implications for this judgment. Rather, they are likely to base their judgment on some subset of these cognitions that is most readily accessible” (p.1660).

If, at the moment I’m making the judgment, I happen to recall more memories in which I acted in an extroverted manner, I am likely to see myself as more extroverted. If I am asked to make a similar judgment on another occasion, but this time I recall more introverted memories; I will see myself as more introverted. In keeping with the availability heuristic, individuals seem to assume that if they can easily bring to mind examples of themselves acting in a trait-consistent manner, they are likely to possess that trait (Schwarz, Bless, Strack, Klump, Rittenauer-Schatka, & Simons, 1991).

Hastie and Park (1986), however, argued that individuals often automatically form impressions of people when they first encode relevant information. When the perceiver is asked for his or her impression, they simply access the impression formed when the relevant information was first encountered, as opposed to constructing an impression based on available memories. So, for example, as I get to know my new acquaintance John, I automatically form an impression of him and his traits, based on relevant observations. When John is late picking me up or when I see his disorganized desk, I automatically determine that he is not conscientious, and I store this judgment in
long-term memory. When I am later asked whether John is conscientious, I simply access this stored judgment, as opposed to forming a new judgment based on the accessibility of relevant information. If this is true, it would seem that primes are unlikely to affect self-perceptions by altering the accessibility of memories because individuals would not need to access memories of relevant behavior to form perceptions (see Kihlstrom, Beer, & Klein, 2003 for a similar perspective).

There are at least two major reasons why people are unlikely to rely on stored judgments as opposed to accessible memories when reporting self-perceptions on a personality measure. First, while it is true that individuals do make automatic judgments in some circumstances, there is a lack of evidence indicating that individuals automatically form impressions concerning the self and that individuals rely on these stored impressions as opposed to relevant memories when asked to make judgments about the self. Hastie and Park (1986) explain that for some judgments, individuals rely on memories in order to make judgments and that the availability or accessibility of relevant memories will color the judgment. Based on the evidence, discussed below, that indicates that changing the accessibility of memories alters self-perceptions and on evidence, discussed above, that indicates that primes do in fact alter self-perceptions, it would appear that judgments about the self often rely on accessing relevant memories.

Second, while it is true that individuals may store some judgments about the self in long-term memory, especially if these judgments are key to the individual’s self-concept (see the sections on self-schemata and chronic accessibility below for further discussion), it seems likely that only fairly broad dichotomous judgments (e.g. ‘I am conscientious’) would be stored, whereas the relatively specific and continuous
judgments that are required for completing items on a complex personality measure (e.g. “In the past, when a friend has asked me to find something (such as a mailing address, a picture, a recipe etc.) how often [on a scale from 1 to 5] did I have to be reminded before I actually gave it to them?”) are unlikely to be formed automatically and unlikely to be stored in long-term memory. There is certainly no evidence that these specific continuous judgments are formed spontaneously and stored in long-term memory, and it seems intuitively implausible.

Presumably, a judgment would only be automatically formed and stored in long-term memory if there was some expectation that the judgment would need to be reported or acted on in the future. I might expect that I will be asked in the future whether or not I am conscientious and that this information might help me to make decisions concerning myself (e.g. I should not attempt tasks which require a high degree of conscientiousness if I am not a conscientious person), but it seems unlikely that I would expect that in the future I will be asked to rate some very specific aspect of conscientious behavior on a Likert scale or that the judgment would prove valuable enough to devote the cognitive resources necessary to encode it into long-term memory.

It’s certainly possible that a broad dichotomous judgment which is stored in long-term memory might have some effect on a specific judgment (knowing that I am conscientious might help me determine how often I need to be reminded before delivering an item) but it is unlikely to be enough. If I am conscientious does that necessarily mean that I quickly get back to people when they ask me to find something, and does the fact that I know I am conscientious allow me to choose whether a four or a five is the more appropriate response? It seems apparent that when making specific
judgments, I will have to rely on the accessibility of relevant episodic memories even if I have a broad judgment stored in memory.

Markus and Kunda (1986) introduced the idea of the **working self-concept**—a sense of self that may vary from one situation to another. According to this view, people have a huge store of self-relevant memories and concepts, and at any one time, only a subset of this information is active. The store of memories provides the self with a consistent base, but the changing saliency of the various memories also leads to a certain degree of malleability. If the saliency of memories consistent with one trait can be increased over that of memories consistent with the opposite trait, self-perceptions should change.

*Altering the accessibility of memories changes self-perceptions.*

A number of studies have indicated that self-perceptions of personality may be altered by manipulations that cause certain memories to become more salient, or accessible, than others. The authors of these studies do not talk about these effects in terms of priming. The techniques used to increase the accessibility of certain memories (e.g. leading questions) are relatively blatant and are not seen in the priming literature. In priming studies, concepts are usually activated by subtly exposing individuals to certain words or phrases in one context and then examining the effects on behaviors and cognitions in an ostensibly unrelated context. Since the paradigm in the following studies is so different, it’s difficult to say whether or not they should be considered examples of priming. These studies do, however, indicate that cues in the environment can affect self-perceptions of personality by making certain memories more salient.

For example, Kunda et al. (1993) found that individuals’ self-reports of where they fell on an introversion/extroversion scale were affected by whether they were asked
“are you *extraverted*? [italics added]” or “are you *introverted*? [italics added]”. The fact that self-ratings changed is an example of the well known acquiescence effect and, in itself, is not very enlightening; what is interesting is that the question seemed to alter the accessibility of various memories. When participants were asked to list memories they would use to answer the question about extroversion (introversion), they recalled memories that were rated by independent judges as being more indicative of extroversion (introversion). Acquiescence has often been explained in terms of demand characteristics, but Kunda et al. (1993) argued that the manipulation was actually causing a sincere shift in identity by making certain memories more accessible than others.

Evidence against the demand characteristic explanation was provided by two other conditions in which participants were asked about extroversion or introversion *in a particular context*. In these conditions, participants were asked “are you extraverted (introverted) in precepts [small group discussions regularly conducted at Princeton University]”. When asked to assess their personality in a specific situation, the wording of the question had no effect. The participants recalled the same amount of introverted or extraverted memories and rated themselves at the same place on an introversion/extroversion scale regardless of which question they were asked. Presumably, this is because the participants had less variability in the available memories for the specific situation.

It has repeatedly been found that behavior is more consistent across time in specific situations than across different situations related to the same trait (Mischel & Peake, 1982; Mischel & Shoda, 1995). For example, how organized an individual kept their desk at the office this week will be an excellent predictor of how organized they will
keep their desk at the office next week, or even next year, but may not be a very good predictor of how organized the person keeps his/her garage. In the Kunda et al. (1993) study, the participant’s behavior in precepts was probably more consistently extroverted or introverted than his/her behavior in general. Thus, the pool of memories that could be drawn from was constrained. Even if a memory search was biased by the wording of the question, the memories made accessible remained relatively constant in terms of extroversion-introversion because all of the memories that existed were highly similar.

The fact that in these conditions the manipulations had no effect seems to rule out the suggestion that the results in the general-question conditions were due to a demand characteristic because the same demand characteristic would have been present in the specific situation conditions.

Another study reported in Kunda et al. (1993) sheds additional light on the question of when different questions will alter self-perceptions. This study was basically a replication of the first study with the addition that participants were asked to rate how much they varied in how extraverted or introverted they were from one situation to another. The effects of the extraverted vs. introverted question were only found among those who rated themselves as being variable on this trait. Again, this seems to rule out the demand characteristic explanation because, presumably, the demand to acquiesce would be just as great regardless of how variable participants perceived themselves to be.

Taken together, the studies reported by Kunda et al. (1993) demonstrate that the way a question is worded affects self-perceptions of personality by making certain memories more accessible.
A related study, reported in Fazio, Effrein, and Falender (1981), found similar results. In this study, participants were randomly assigned to conditions in which they answered questions about behaviors that were either generally associated with extroversion (e.g. what would you do if you wanted to liven things up at a party) or introversion (e.g. what things to you dislike about loud parties). The free-response answers given by participants were tape-recorded and then rated by judges who were unaware of the purpose and methods of the study. The judges rated the responses given by the participants in the extroversion condition as being more indicative of extroversion than the responses of the participants in the introverted condition. The authors concluded that the biased questions had made memories consistent with one pole of the extroversion/introversion scale more accessible. This manipulation also changed participants’ self-perceptions with regard to their standing on traits related to extroversion/introversion. In an ostensibly unrelated second study, those who were asked about extraverted behaviors indicated that they were closer to the extraverted pole on relevant bipolar items (e.g. talkative-quiet, outgoing-shy) than those asked about introverted behaviors. Furthermore, when probed for suspicion, none of the participants indicated that the questions they were asked in the first study influenced their personality self-report in the second study.

A similar method was used by Salancik and Conway (1975) to influence participant’s self-perceptions of religious attitudes. Salancik and Conway (1975) first asked individuals a number of questions about religious practices and then asked them to rate their attitudes towards religion. The questions were biased, however, in order to make either pro-religious or anti-religious memories more salient. Just as in the Kunda et
al. (1993) and Fazio et al. (1981) studies, when certain memories were made more salient, self-perceptions changed. In this case, those asked questions designed to make pro-religious memories more salient rated themselves as more religious than those asked questions designed to make anti-religious behaviors more salient.

Another line of evidence which indicates that self-perceptions can be altered by making certain memories more accessible involves studies in which participants are led to associate a certain trait with success. Kunda and Sanitioso (1989) led participants to believe that either extroversion or introversion were associated with academic success by having them read a (fictitious) study to that effect and then having them explain why the effect might have been observed. Then, in what was supposedly a separate experiment, they had participants decide whether a number of traits could be applied to them or not; of 73 trait adjectives, 20 were associated with either extroversion (e.g. “outgoing”, “poised”) or introversion (e.g. “shy”, “awkward”). Participants who were led to believe that extroversion was associated with success endorsed more extroversion adjectives than participants led to believe that introversion was associated with success.

It is important to note that the participants responded anonymously and had no reason to deceive the experimenters; so, it is unlikely that the results were due to self-presentation. The ratings appeared to represent honest self-evaluations which changed depending on cues in the environment. Kunda and Sanitioso (1989) argued that the manipulation motivated the participants to see themselves as more extroverted (introverted) because they wanted to see themselves as people likely to succeed in the academic domain. Then, when they were asked to rate themselves on these traits, their search for relevant memories was biased; extroverted (introverted) memories became
more salient because these types of memories were being sought while memories inconsistent with the desirable trait were relatively ignored.

The hypothesis that the change in self-ratings was due to a change in accessible memories was tested in a subsequent study by Sanitioso et al. (1990). This study used a similar methodology; participants read a study indicating that extroversion (introversion) was associated with academic and professional success and were asked to explain why and then participated in a supposedly unrelated second study. In the second study, participants were asked to “…think of behaviors you have performed in the past that, you feel reflect your standing on that dimension…” (p. 231). Participants led to associate extroversion (introversion) with success in a relevant domain were more likely to list an extroverted (introverted) memory first, demonstrating that trait-consistent memories had become more accessible. Participants led to believe that introversion was associated with success also listed more introverted memories overall than participants led to associate extroversion with success. In a subsequent study, it was demonstrated that leading participants to associate extroversion with success caused participants to recall instances of extroverted behavior faster, providing further evidence that when a trait is associated with success, trait-consistent memories become more accessible.

The final study reported in Sanitioso et al. (1990), once again, demonstrated that associating extroversion (introversion) with success led participants to view themselves as more extroverted (introverted). In this study, the authors also had baseline self-reports of personality because all participants had previously completed the Eysenck Personality Inventory (EPI). The post-manipulation endorsement of extroverted and introverted trait terms was influenced by both the manipulation and individual’s baseline sociability score.
on the EPI. This indicates that individuals were changing their self-perceptions, but the changes were constrained. It was possible, for example, to make participants who originally saw themselves as very extroverted see themselves as less extreme on this trait by linking introversion with success, thus, increasing the accessibility of the few introverted memories they did have, but even after the manipulation, these people still saw themselves as relatively extroverted. It was not the case that people who saw themselves as very extroverted suddenly saw themselves as very introverted after the manipulation. This seems to support the suggestion made by Markus and Kunda (1986) that an individual’s overall store of memories causes perceptions of the self to be somewhat consistent, but the changing saliency of the various memories also leads to a certain degree of malleability.

All of these studies indicate that self-perceptions are somewhat malleable because they are dependent on a store of inconsistent memories, only a subset of which is accessible at any given moment. Memories consistent with certain self-perceptions can be made more accessible by cues in the environment. This will lead to corresponding changes in self-perception. While none of these authors discuss their results as being due to priming, these studies, particularly Kunda et al. (1993), suggest that primes might cause changes in self-reports of personality by altering the accessibility of certain memories. Kunda et al. (1993) were concerned specifically with the content of questions; one could argue, however, that similar results would be achieved if the trait term is presented in some other, more subtle manner.
Priming affects personality self-perceptions by affecting memory.

Primes may affect personality self-reports by making some memories more salient and, thus, easier to recall. Priming has usually been explained as resulting from differences in encoding new information as opposed to differences in recalling old information (Srull & Wyer, 1979, 1980). However, biased questions and other manipulations have been shown to affect the recall of memories (Kunda et al., 1993; Sanitioso et al., 1990). If primes are also capable of making certain memories more accessible, it would explain how primes are able to change self-perceptions.

Since its first appearance in the cognitive literature, priming has generally been explained in terms of spreading activation (Collins & Loftus, 1975) both in the cognitive (Loftus & Loftus, 1974) and social psychology (Skowronski, et al., 1993) literatures, (although see Dosher & Rosedale, 1989 and McKoon & Ratcliff, 1992 for alternative explanations). According to the theory of spreading activation, concepts are represented in the mind by various nodes. The more related two concepts are, the stronger the connection between their respective nodes. When one node is activated, the accessibility of the concept stored at that node is increased, and the increase in accessibility spreads across its connections with other nodes such that activating one concept will also activate (although to a lesser degree) related concepts.

These concepts are stored in long-term memory. Under the classification system suggested by Tulving (1993), long-term memory can be divided into episodic and semantic systems. Episodic memories involve mental time-travel or the ability to re-experience a previous event in which the individual was an actor. Semantic memory involves the meaning of words, as well as facts and other things which the person can
have knowledge of but which are not set in a temporal/autobiographical context.

Memories of oneself engaging in behaviors relevant to a trait would be stored in episodic memory (Sakaki, 2007).

Self-perceptions appear to be malleable because they rely on episodic memories of trait-relevant behavior, which can be made more or less accessible by cues in the environment. Biased questions, for example, seem to alter self-perceptions by making certain episodic memories more accessible (Fazio et al., 1981; Sanitioso et al., 1990).

There is even evidence that biased questions and other environmental cues can change the content of episodic memories. For example, Loftus and Palmer (1974) showed participants a film of a car accident. Some participants then answered the question “About how fast were the cars going when they hit each other?”, while others were asked “About how fast were the cars going when they smashed into each other?”. Those who received the question containing the word “hit” gave lower speed estimates than those who received the question containing the word “smashed”. A subsequent study, reported by Loftus and Palmer (1974), demonstrated that participants who received the “smash” question were more likely to falsely remember broken glass in the film than those who received the “hit” question. Hundreds of similar studies have demonstrated that episodic memories may be altered by cues in the environment (for reviews see Loftus, 2004, 2005). Could primes affect episodic memories? Does activation spread from nodes activated directly by primes to nodes containing relevant episodic memories?

Specifically, would mere exposure to trait terms affect the accessibility of trait-relevant episodic memories?
Some of the research which specifically addresses this question is discussed below. It is important to remember that in cognitive psychology, the term “priming” is used to refer to any situations in which a cue affects the accessibility of relevant information, *whether the perceiver is aware of the connection or not*. This distinction is important because the cues in the studies below are presented in a blatant manner and would probably not be considered primes, using the definition of priming accepted in social psychology (which is the definition used by this paper). These studies are still important, however, because they address possible connections between exposure to trait adjectives and the accessibility of trait-relevant episodic memories.

_The Klein model._

Some researchers argue that exposure to trait words does not affect the accessibility of trait-relevant episodic memories or any other kind of personal knowledge (Babey, Queller, & Klein, 1998; Kihlstrom, Beer, & Klein, 2003; Klein, Babey, & Sherman, 1997; Klein, Chan, & Loftus, 1999; Klein, Cosmides, Tooby, & Chance, 2001; Klein & Loftus 1993a, b, c; Klein, Loftus, & Burton, 1989; Klein, Loftus, & Kihlstrom, 1996; Klein, Loftus, & Plog, 1992; Klein, Loftus, & Sherman, 1993; Klein, Loftus, Trafton, & Furnham, 1992; Klein, Sherman, & Loftus, 1996; Schell, Klein, & Babey, 1996). According to the model proposed by Stanley Klein and his colleagues, the self is stored in two different structures in memory; one of these structures includes trait summaries stored in semantic memory, the other structure includes specific trait-relevant autobiographical memories stored in episodic memory. Trait summaries are thought to include both overall evaluations (e.g. ‘I am kind’) and *generalizations* about behavior (e.g. ‘I _usually_ help old women who need to cross the street’), while _specific_ trait-relevant
memories (e.g. ‘this morning I helped an old woman cross the street’) are stored independently in episodic memory (Klein & Loftus, 1993b).

Trait summaries are thought to form automatically once some minimum amount of trait-relevant behavior has been engaged in. So, no one can have a trait summary (e.g. ‘I am extraverted’) until they have engaged in at least some extroversion-relevant behavior, but once they have engaged in enough relevant behavior, they form a trait summary. These trait summaries are thought to be stable and independent of episodic memory once they have been formed. So, according to the Klein et al. model, even if one could increase the accessibility of trait-relevant memories, it would have no effect on trait summaries and would not, therefore, influence an individual’s endorsement of traits. Nor should increased accessibility of episodic memories impact responses to questions about thoughts, feelings, and behavior seen on complex personality measures because these questions generally ask about generalizations (e.g. “are you usually early to appointments”) which would be stored in semantic memory and would, therefore, not be affected by changes in the accessibility of episodic memories. Unlike Bem (1967), Klein et al. suggest that when a person is asked whether or not a given trait is applicable to them they do not have to infer their personality based on available evidence; they just know where they stand with regards to that trait. This knowledge is stored in semantic memory, and episodic memories need not be accessed under most circumstances.

Klein et al. believe that priming can take place. They argue, for example, that the recall of one episodic memory might prime the recall of another (Klein & Loftus, 1993b). Klein et al. also believe that manipulations which increase the saliency of trait generalizations might alter endorsements of these traits (this was how, for example, Klein
and Loftus (1993b) explained the fact that biased questions altered self-reports of personality in Fazio et al. (1981). They do not believe, however, that trait adjectives themselves can prime any sort of self-knowledge. These researchers are so confident that exposure to trait adjectives do not affect self-knowledge that they generally use trait primes, in which individuals are asked to read or define a trait adjective (usually the latter), as a control against which they measure the efficacy of other primes. If these other primes are not superior to the trait adjective primes, then no priming is said to be present (Klein & Loftus, 1993b).

The assumption that exposure to trait adjectives will not increase the accessibility of trait-relevant memories or trait-summaries is rather tenuous. It seems quite logical that processing a trait adjective would tend to bring to mind both memories in which we acted in a manner consistent with that trait and conclusions about whether or not the trait applied to one’s self. For example, if I am asked to define the trait extroverted, my stream of thought might go something like this: ‘extroverted, that involves wanting to be around lots of people, for example parties, extroverts would enjoy parties, like that party I was at Saturday, I enjoyed that party, extroverts enjoy parties, I must be extroverted’. It seems intuitive that exposure to a trait adjective would often lead one to think of behaviors which exemplified that trait and to memories of one demonstrating those behaviors. It also seems easy to imagine how encountering a trait adjective might lead one to consider whether or not the trait applied to them.

When explaining their decision to use trait terms as a control, against which the efficacy of other primes were measured, Klein and Loftus (1993b) note “we assumed in choosing it that performing this task would not involve self-knowledge; but although this
seemed intuitively plausible, we had no direct evidence in support of our assumption” (p.12). As was stated above, this assumption seems to run counter to intuition and, as others noted, it seems “rather implausible” [italics added] (Brown, 1993, p. 63). Klein et al. offer three lines of reasoning in defense of their decision. First, the speed with which people define a trait is not moderated by self-relevance while the speed with which people recall trait-relevant episodic memories, or decide whether a trait applies them, is moderated by self-relevance. Second, defining a trait does not show differential priming across conditions in which other primes show differential priming. Third, several studies have shown that individuals do not necessarily organize traits in terms of self-relevance.

Klein et al. (1992) had participants perform three tasks with 15 different traits. Participants defined each trait (define task), recalled a trait-relevant episodic memory (recall task), and decided whether or not the trait applied to them (describe task). Participants then indicated on a Likert scale how self-descriptive the traits were. Klein et al. (1992) found that the self-relevance of the trait moderated the speed with which people were able to recall a trait-relevant episodic memory and the speed with which people decided whether a trait applied to them. This moderation was not found, however, when participants defined the trait adjective. The authors argue that these results indicate that recalling a trait-relevant episodic memory and deciding whether or not a trait applied to them “involve self-knowledge” while defining a trait does not. While it seems clear that the task of defining a trait, in and of itself, does not necessarily involve self-knowledge, the real question is whether or not defining a trait causes activation to spread to self-knowledge. It is entirely possible that a task may not require an individual to access self-knowledge but that the task may incidentally activate self-knowledge. For
example, if I am asked to whether or not Poland is a member of the European Union, I can complete this task without accessing any sort of self-knowledge. However, answering the question may incidentally cause me to think of my Polish grandmother and the authentic pierogi she served me when I visited her last month. Similarly, defining the term extroversion does not require me to access self-knowledge, but it may very well lead to the activation of trait-relevant self-knowledge. The results of the Klein et al. (1992) study do not address the question of whether or not activation spreads to episodic memories. Thus, these results do not rule out the possibility that exposure to trait terms increases the accessibility of episodic memories.

The second line of evidence offered to support the contention that exposure to trait words does not activate episodic memories involves differential patterns of priming effects across situations (Klein & Loftus, 1993c). The authors had participants perform one of the three tasks described above (define, recall, or describe) for a given trait and then examined how this initial task affected the speed with which participants performed subsequent tasks involving the same trait. The authors point out that when participants are asked to recall a trait-relevant episodic memory or determine whether or not a trait describes them, these tasks show stronger priming effects (effects on the speed with which subsequent tasks are performed) in some situations than in others. However, when participants are asked to define a trait, the effects of this task on the latency of the subsequent task are consistent across situations.

In the situations where the recall and describes tasks show stronger priming effects, Klein and Loftus (1993c) assume that the define task is having no effect. They argue, therefore, that “the hypothesis that definition generation activates self-knowledge
would have to incorporate a number of exceptions to the rule” (Klein & Loftus, 1993c, p. 175). What they mean is that if the define task isn’t having as much of an effect on the speed with which subsequent tasks are performed as the other tasks are, it isn’t acting as a prime, and if it isn’t acting in a prime in some situations, a complex theory would be necessary to explain why it is acting as a prime in some situations but not others. Similar arguments are made by Klein et al. (1997).

This conclusion rests on a faulty assumption. Specifically, there is no reason to assume that when the recall and describe tasks show stronger effects, that the define task is having no effect. It is entirely plausible that the define prime is showing consistent priming effects across situations while the recall and describe tasks are stronger primes in some situations than in others. Another way of putting this is that all of the tasks are responsible for priming effects in all of the conditions but that the 3 tasks are equally potent in some situations while the recall and describe tasks are stronger primes than the define task in other situations. This explanation is just as parsimonious as the one offered by Klein and Loftus (1993c) or Klein et al. (1997) and, as will be discussed below, other data indicate that this is probably what is happening.

The third line of evidence used to support the position that exposure to trait adjectives does not activate self-knowledge involves studies which examine whether or not traits are encoded in terms of self-reference. A number of studies are cited by Klein et al. (1997) which demonstrate that trait words are not generally organized in the mind primarily in terms of whether or not they are self-relevant. For example, priming paradigms have shown that items organized into a category will tend to prime each other, but this is not seen for self-relevant traits more than non-self-relevant traits (Higgins, Van
Hook, & Dorfman, 1988). Release from proactive interference paradigms have also been used to demonstrate that concepts are organized into categories, and studies using this paradigm have failed to find evidence that traits are clustered in the mind in terms of whether or not they are self-relevant (McDaniel, Lapsley, & Milstead, 1987). Additional studies have shown that when trait information is encoded in terms of self, memory for this information is increased but that people do not automatically encode trait information this way (Reeder, McCormick, & Esselman, 1987). All of these studies lead us to believe that trait words are not necessarily encoded or organized in terms of their relevance to the self, but none of these studies address whether or not exposure to trait adjectives will increase the accessibility of trait-relevant memories. It is, therefore, difficult to understand why Klein et al. (1997) cited them as having “shown that the mere act of reading a trait word does not activate personal knowledge of any kind, behavioral or otherwise, regarding the trait” (p. 187).

Criticalism of the Klein model.

A number of other researchers have pointed out flaws with the reasoning of Klein and his colleagues. While a number of different criticisms have been offered, two pieces of evidence are particularly important. First, other researchers using a paradigm similar to Klein et al. have shown that reading a trait adjective does increase the accessibility of trait relevant memories (Sakaki, 2007). Second, as a number of researchers have pointed out, Klein et al.’s own data indicate that defining a trait adjective increases the accessibility of trait-relevant episodic memories (Brown, 1993; Schneider, Roediger, & Khan, 1993).
Sakaki (2007) explicitly tested the assumption that reading a trait adjective will increase the accessibility of trait-relevant episodic memories, and the results are illuminating. In order to discover whether exposure to trait words increased the accessibility of trait-relevant episodic memories, the authors exposed participants to either a trait adjective (e.g. “gentle”) or a string of asterisks (e.g. “****”) and then had participants recall a memory in which they behaved in a manner consistent with a trait (sometimes the primed trait, sometimes a different trait). Participants who had been exposed to a trait adjective were able to recall an episodic memory relevant to that trait faster than those who had been exposed to a non-word prime. In order to prevent participants from consciously searching for a trait-relevant episodic memory when they were presented with the trait word, the critical trials were intermixed with filler trials in which the trait word presented to participants as a prime had no relation to the kind of memories participants were asked to recall (these filler trials made up the majority of trials overall).

Another study reported in Sakaki (2007) demonstrated that participants who were exposed to primes including a trait adjective (e.g. “smart”) were able to recall memories for semantically related traits (e.g. “intellectual”) faster than they were able to recall memories for semantically unrelated traits (e.g. “nervous”). These studies are consistent with a spreading activation account of priming wherein exposure to a trait adjective activates the trait concept and relevant episodic memories. Sakaki (2007) concluded that “…personal episodes are linked to related semantic knowledge in long-term memory. Therefore, defining or reading a trait word can also facilitate the recall of personal episodes” (p. 13).
Brown (1993) also criticized Klein et al.’s assumption that exposure to trait terms does not prime trait-relevant episodic memories. Brown (1993) suggested that Klein et al.’s studies be replicated with an adequate control (see also Keenan, 1993). As the Sakaki (2007) study shows, when compared to a control task, reading a trait term does facilitate recall of a trait-relevant episodic memory. Brown (1993) made another important observation. Namely, data reported by Klein et al. themselves indicate that exposure to trait terms increases the accessibility of trait-relevant episodic memories.

For example, Klein et al. (1989) report data concerning the speed with which participants are able to recall a trait-relevant episodic memory after defining a trait adjective. They also report data on the speed with which participants are able to recall a trait-relevant episodic memory when there is no prime. Comparing these two sets of data make it clear that defining a trait increases the speed with which participants are able to recall trait-relevant episodic memories (Schneider et al., 1993). Klein et al. (1989) do not make this comparison although it would have been logical and easy to so. Instead of comparing the effect of the defining a trait on the speed with which people can recall a trait-relevant episodic memory to a baseline, in which people recall a trait-relevant episodic memory without first defining the trait, Klein et al. (1989) simply assume that defining a trait has no effect.

While consensus on this issue has not yet been reached, there does seem to be some evidence that exposure to trait adjectives can increase the accessibility of trait-relevant episodic memories. This may represent the path through which primes affect self-perceptions. Understanding the process through which primes affect personality self-reports has important theoretical implications. If the accessibility of memories is
indeed a mediator between primes and their effects on responses to personality measures, demonstrating this will help us to construct a more accurate model of these effects. This may help us to better understand who is most susceptible to priming and why (see below). A better understanding of the process may also lead to insights into how we can protect or increase the utility of personality measures by controlling exposure to primes in the testing situation.

H3. Accessibility of episodic memories of conscientious behavior, as operationalized by the primacy (H3a) and frequency (H3b) of recall of these memories, will mediate the relationship between exposure to conscientiousness trait terms and scores on the complex personality measure of conscientiousness.

Figure 2.3 Hypothesis 3

H4. Accessibility of episodic memories of conscientious behavior, as operationalized by the primacy (H4a) and frequency (H4b) of recall of these memories, will mediate the relationship between exposure to descriptions of conscientiousness behaviors and scores on the complex personality measure of conscientiousness.

Figure 2.4 Hypothesis 4
Self-Concept Clarity is a Moderator

Stapel and Koomen (2000a) found that self-concept clarity (also known as self-perceived mutability) moderated the effect of primes on self-perceptions of personality. Specifically, those who saw themselves as more mutable were more likely to show shifts in self-perceptions of personality. Stapel and Koomen (2000a) argued that primes would only increase relevant self-perceptions among people with malleable self-concepts; “there must be room in people’s self-views for inclusion” (p. 1069). It was suggested that people who perceived themselves as mutable were likely to have room for change and, thus, would be able to incorporate primed concepts into the self-concept.

In some studies, self-concept clarity was manipulated, but in others, it was measured as an individual difference using the Self-Concept Clarity Scale (Campbell et al., 1996). Campbell et al. (1996) defined self-concept clarity as “the extent to which the contents of an individual’s self-concept (e.g. perceived personal attributes) are clearly and confidently defined, internally consistent, and temporally stable” (p. 141). Self-concept clarity is assessed with a scale that asks a number of questions about the stability and distinctiveness of self-perceptions (e.g. “my beliefs about myself seem to change very frequently”, “in general, I have a clear sense of who I am”). Scores on the self-concept clarity have been shown to be related to the internal consistency and temporal stability of self-perceptions (Campbell et al., 1996).

The self-concept clarity construct is theoretically related to the idea of implicit theories. Implicit theories are beliefs that an individual holds about the malleability of personality or other internal characteristics (Dweck & Leggett, 1988). According to this theory, for any set of internal characteristics (e.g. intelligence, morality, personality),
people have either an entity or incremental belief system. Implicit theories are generally assessed with 3 or 4 item scales that assess beliefs about the malleability of some trait (e.g. “you can learn new things, but how intelligent you are stays pretty much the same”). Those with an entity theory believe that the characteristic is fixed and uncontrollable. Those with an incremental theory believe that the characteristic is malleable and acquirable. People with an entity theory of personality believe behavior is more stable and predictable, are more willing to make global evaluations and inferences based on limited information about another person, and are more likely to attach strong evaluative tags to isolated behaviors (Dweck, Hong, & Chiu, 1993). So, implicit theories of personality, like self-concept clarity, deal with the beliefs about the stability or mutability of personality. One major difference between these two constructs is that self-concept clarity deals specifically with beliefs about the self whereas implicit theories deal with beliefs about people in general.

Another similar construct is that of implicit theories of traitedness and contextuality. These implicit theories are similar to entity vs incremental theories of personality (they are modestly correlated) but are seen as more comprehensive (Church, Ortiz, Katigback, Avdeyeva, Emerson, Flores, & Reyes, 2003). Specifically, these theories are thought to encompass beliefs about the temporal stability of traits, the cross-situational consistency of trait-relevant behavior, the ability to predict behavior using knowledge about traits, the ability to infer traits based on limited samples of behavior, and the believe that people can be accurately described and understood in terms of traits. Individuals who subscribe to implicit theories of traitedness focus on traits as explanations of their own and others behavior. Individuals who subscribe to implicit
theories of contextuality focus on roles, relationships, and situational factors when explaining or predicting behavior. These implicit theories are assessed with items that ask people to endorse statements about beliefs relevant to each of the facets discussed above (e.g. “People who are friendlier than others now will probably remain friendlier than others in the future as well”, “A person’s personality characteristics strongly influence their behavior in a variety of situations”). Items refer to both personality in general and specific traits. As with self-concept clarity, implicit theories about traitedness and contextuality deal with beliefs about the stability or mutability of personality. Unlike self-concept clarity, implicit theories of traitedness and contextuality deal with beliefs about people in general rather than the self in particular.

Other researchers have examined self-perceptions of mutability with regard to specific traits. As mentioned above, Kunda et al. (1993) found that when individuals rated themselves as highly consistent with regard to extroversion, biased questions about extraverted behaviors had less of an impact. Kunda et al. (1993) argued that the questions were only capable of making certain memories more accessible if the memories were there to begin with. Most people are thought to have memories of times when they acted in an extraverted manner and times in which they acted in an introverted manner, but some people may possess a more consistent set of memories because their behavior is more consistent with regard to a given trait. Bem and Allen (1974) found evidence that some individuals behave more consistently with regard to a given trait than others, and these individuals were aware of the degree of consistency and could, therefore, report it (although see Mischel & Peake, 1982).
If behavior is more consistent among some people (whether at the trait or person level), it seems likely that memories (at that level) will also be more consistent. If an individual’s store of memories is relatively consistent, he/she may be less susceptible to priming. According to this line of thinking, some individuals have a relatively inconsistent store of memories which causes them to see their personality as relatively ambiguous and mutable. When these people are exposed to a prime related to either pole of a bipolar trait scale, the prime is able to ‘find’ memories to activate which, in turn, causes a change in self-perceptions.

For other individuals, memories are relatively consistent and tend to cluster around one pole of a bipolar trait scale. These individuals are relatively unaffected by primes. If primes consistent with the memory store are encountered, these primes are able to ‘find’ plenty of memories to activate, but the increased accessibility of these memories is unlikely to have a major impact on self-perceptions because the individual already sees himself as possessing the trait in question; the prime is essentially redundant. If the individual encounters a prime that is inconsistent with their memory store, the prime cannot ‘find’ many memories to activate; thus, there is no change in self-perception. Either way, primes are likely to have a muted effect on self-perceptions among these individuals.

Markus (1977) suggested that for any given trait, some individuals, called schematics, have a relatively detailed and well-developed cognitive structure concerning the self in regard to that trait while others, referred to as aschematics, have a less well-defined self-conception in terms of that trait. Individuals who are schematic on a trait are identified as those who rate themselves at one extreme or the other on that trait and rate
that trait as being important to their sense of self. Schematics have been shown to endorse trait-consistent terms faster, recall more episodic memories of trait-consistent behavior, and assign a higher likelihood to the chances of acting in a trait-consistent manner in the future than aschematics. Markus (1977) also found that schematics were more resistant to false feedback which ran counter to their self-perceptions. This evidence suggests that the self-perceptions of a personality trait will be less susceptible to influences in the environment when an individual is schematic on that trait. Also, recall that Sanitioso et al. (1990) found that baseline personality self-reports constrained the effect that associating a trait with success had on self-reports of personality.

Higgins, King, and Mavin (1982) argued that the accessibility of social constructs, such as traits, varies from one person to another, and each individual may have certain constructs which are usually accessible. This phenomenon has been termed chronic accessibility. Chronic accessibility has been measured in different ways, but usually a participant is asked to provide trait terms which describe them and several other individuals or types of people (e.g. “people you try to avoid”), and the traits that are listed first and/or often are said to be chronically accessible to the individual. Individuals have been shown to remember information relevant to their chronically accessible traits better than information related to other traits (Higgins et al., 1982). Chronic accessibility has also been shown to affect the formation of impressions of others (Bargh, Bond, Lombardi, & Tota, 1986; Bargh, Lombardi, & Higgins, 1988; Bargh & Thein, 1985; Higgins et al., 1982; Higgins & Brendl, 1995), but it is not yet clear how this construct affects self-perceptions.
Self-concept clarity, implicit theories, self-perceived consistency, chronic accessibility, and self-schemas have been measured and defined in different ways and it is unclear to what degree these concepts overlap. These constructs are similar, however, in that they suggest that the self-perceptions of certain individuals are more susceptible to priming because those individuals have a less consistent self-concept or memory store (at least with regard to certain traits). This would be consistent with the biased activation model proposed by DeMarre et al. (2005) which suggests that primes activate content already stored in the self-concept. If the episodic memories concerning a given trait are not mixed or ambiguous to some degree, primes will have no effect. Certain traits that are central to the self-concept may have more consistent sets of episodic memories. Certain individuals (those who have low self-concept clarity, or who subscribe to the entity or traitedness theory of self) may have more consistent episodic memories for many traits.

H5. Self-concept clarity will moderate the relationship between exposure to conscientiousness trait terms and accessibility of episodic memories, such that priming effects will be stronger for those who are higher in self-concept clarity.

Figure 2.5 Hypothesis 5

66
H6. Self-concept clarity will moderate the relationship between exposure to descriptions of conscientiousness behaviors and accessibility of episodic memories, such that priming effects will be stronger for those who are higher in self-concept clarity.

Figure 2.6 Hypothesis 6

Private Self-Consciousness is a Moderator

Private self-consciousness is the degree to which individuals attend to their inner thoughts and feelings, a specific kind of self-focused attention (Fenigstein, Scheier, & Buss, 1975). Private self-consciousness has been shown to moderate priming effects (Hull et al., 2002). Specifically, those high in private self-consciousness are more likely to be affected by primes. Private self-consciousness is thought to moderate priming because individuals who are more self-conscious are more sensitive and responsive to cues which can be encoded in terms of the self. Encoding these cues in terms of the self may, in turn, increase the accessibility of relevant episodic memories.

H7. Private self-consciousness will moderate the relationship between exposure to conscientiousness trait terms and accessibility of episodic memories, such that priming effects will be stronger for those who are higher in private self-consciousness.
H8. Private self-consciousness will moderate the relationship between exposure to descriptions of conscientiousness behaviors and accessibility of episodic memories, such that priming effects will be stronger for those who are higher in private self-consciousness.
Current Study

This study sought to address 3 questions pertaining to the effects of primes on self-perceptions of personality. First, how do primes affect self-perceptions? Specifically, are the effects of primes on self-perceptions mediated by the accessibility of memories, and is this effect moderated by self-concept clarity? Second, do primes affect responses to complex personality measures? Third, do descriptions of trait-relevant behavior prime personality self-perceptions measured with complex personality measures?
CHAPTER III

METHODS

Participants

172 undergraduates from the University of Akron participated in order to receive extra credit in various psychology courses. Each participant was randomly assigned to one of three priming conditions.

Design

This study used a between-subjects design. The independent variable was exposure to primes. The dependent variable was scores on the Conscientiousness Biodata Questionnaire (CBDQ). There were 3 conditions, two experimental and one control. The first experimental group was exposed to trait adjectives related to conscientiousness. The second experimental group was exposed to descriptions of conscientious behaviors. The control group was exposed to neutral words. Two moderator variables, self-concept clarity and private self-consciousness, and one mediator variable, accessibility of episodic memories of conscientious behavior (measured in terms of primacy and frequency), were also assessed.

Procedure

Participants were recruited for two ostensibly unrelated tasks, described as a language task and a memory task, in order to earn extra credit for psychology classes. In order to support the fiction that the two tasks were independent, participants were asked...
to sign two consent forms, printed in different formats and fonts, and handed out and collected by different researchers. They were told that their data would be kept completely confidential. The first researcher told participants that they would complete some questionnaires and a language task currently in development. They were then handed a packet. The first section of the packet contained the measure of self-concept clarity and private self-consciousness. The second section contained one of the three priming tasks: a scrambled sentence task containing either conscientiousness trait terms, descriptions of conscientious behavior, or neutral words. Participants were randomly assigned to one of the three conditions; the researcher entered each class with an equal number of packets for each condition and these packets were organized such that each three packets handed out contained 1 of each condition. The first researcher collected the packets upon completion. This task took about 7 minutes.

After the participants completed the first task, the second researcher gave them the second packet. Participants were told that this was a study about memory and personality. The first section of this packet contained the measure of memory accessibility. The second section contained the complex personality measure. This packet took about 15 minutes to complete. After completing the second task, participants were debriefed and thanked for their participation.

Measures

The complex personality measure was a shortened version of the Conscientiousness Biodata Questionnaire (CBDQ) (Gee & Snell, 1998; Appendix F). This measure contains 15 items, 1 or 2 each from the following subfacets: dependability, planfulness, organization, self-discipline, deliberation, high standards, attention to detail,
and particularity. The items concern past behavior (e.g. “how frequently do you ask for extensions on projects or papers?”). The coefficient alpha reliability for the full scale (44 items) has been reported at .89 (Gee & Snell, 1998). The coefficient alpha reliability for the subfacets are .64 for dependability, .67 for planfulness, .72 for organization, .65 for self-discipline, .71 for deliberation and .73 for particularity. Information on the internal reliability of 2 facets (high standards and attention to detail) was unavailable (Gee & Snell, 1998). The CBDQ has a correlation of .62 with the conscientiousness factor of the NEO PI-R and criterion related validity of .17 when predicting job performance.

Responses are made using a 5-point Likert scale. Higher scores indicate a higher amount of conscientiousness. A number of items are reverse coded. Analyses were conducted to determine whether or not the primes differentially affected reverse coded items. The measure used in this study also contains 30 filler items in order to disguise the connection between the scrambled word task and the personality measure. In the version in Appendix F, the items that form the actual CBDQ are marked with an asterisk (in the measure given to participants, the asterisks were not present).

The priming manipulation consisted of three conditions: trait adjectives, trait-relevant behaviors, and control. All conditions took the form of a Scrambled Sentence Task (Bargh et al., 1996; Srull & Wyer, 1979; Appendix D). The measure contains 12 items. For each item, participants use the five words listed in random order to construct a grammatically correct four-word sentence as quickly as possible. For example, participants provided with “flew eagle the plane around” can make the sentences “the eagle flew around” or “the plane flew around”. The actual sentence constructed is
irrelevant. The only purpose of the scrambled-sentence task is to serve as a mechanism for exposing participants to certain words or phrases, intended to prime relevant concepts.

Three versions of the scrambled sentence task were constructed. In the first version, 4 of the 12 items contain a trait term related to conscientiousness which needs to be used to form a sentence (e.g. “is he hardworking scooter so”). These items appear in the 2nd, 5th, 7th, and 9th position. The trait terms used are “hardworking, organized”, “professional”, and “productive”. The second version contained sentences which, when unscrambled, describe conscientious behavior (e.g. “he completes the assignment”). These items also appear in the 2nd, 5th, 7th, and 9th position. The primes are “he completes the assignment”, “she arrives on time”, “they follow the schedule”, and “carry out the plans.” The third version, intended to act as a control, does not contain trait adjectives or trait-relevant behaviors. Instead, it contains neutral words.

In order to assess the accessibility of memories, participants were given the following instructions adopted and modified from Sanitioso et al. (1990) (see Appendix E):

Try to think of behaviors you have performed in the past that, you feel, reflect your standing on that dimension. For example, if the dimension was outgoing/quiet, you might say “Yesterday I just stayed in and watched a movie by myself instead of going out with my friends”, or “I had a great time at the party last weekend.” Use your own frame of reference and don’t worry about how others might interpret your examples.

Participants were then presented with 3 bipolar trait pairs (“outgoing/quiet, laid-back/structured, imaginative-practical”) and space to provide relevant memories (Appendix E). The only pair of interest for this study was laid-back/structured. Following the technique developed by Sanitioso et al. (1990), each memory was coded
by 2 independent judges as to whether or not it was indicative of conscientiousness.

Accessibility of episodic memories of conscientious behavior was assessed by measuring primacy and frequency. Specifically, whether or not a memory of conscientious behavior was listed first was recorded for each participant (primacy) and the total number of memories of conscientious behavior (frequency) was recorded for each participant. If memories of conscientious behavior were listed first with significantly higher frequency in one condition, memories of conscientious behavior were said to be more accessible in that condition. Additionally, if significantly more memories of conscientious behavior were listed by participants in one condition, memories of conscientious behavior were said to be more accessible in that condition.

Self-concept clarity was measured with the 12-item Self-Concept Clarity Scale (Campbell, et al. 1996; Appendix B). Self-concept clarity has been defined as “the extent to which the contents of an individual’s self-concept (e.g., perceived personal attributes) are clearly and confidently defined, internally consistent, and temporally stable” (Campbell et al., 1996, p.141). This scale is unidimensional and intended to measure perceived internal consistency, temporal stability of self-beliefs, and general self-certainty (e.g. “In general, I have a clear sense of who I am and what I am”). Responses are made using a 5-point Likert scale. Coefficient alpha reliabilities for the scale have been reported as .86 and .85, test-retest reliability at .79 and .7. This measure has been shown to predict internal consistency on personality measures ($r = .31$) and temporal stability in responses to personality measures ($r = .31$) (Campbell et al., 1996). Higher scores indicate a higher degree of self-concept clarity. A number of items are reverse coded.
Private self-consciousness was measured with the 10 item Private Self-Consciousness Scale (Fenigstein et al., 1975; Appendix C). Private self-consciousness has been defined as the degree to which one attends to inner thoughts and feelings. The scale is unidimensional. Test-retest correlations for the scale are reported as .79. Internal reliability data are unavailable. Responses are made using a 5-point Likert scale. Several of the items are reverse-coded.

In order to probe for suspicion, participants were asked the following questions, adapted from Thompson et al. (1994) (see also Staple & Koomen, 2000; Appendix G):

“1. You have just participated in two experiments. Do you think that completing the first experiment impacted your answers in the second experiment? If so, please explain.” and “2. Did you notice any themes in the scrambled sentence task you completed in the first experiment? If so, please explain”.

In order to qualify as suspicious, participants had to indicate that they thought the scrambled sentence task was related to the personality inventory because they both dealt with personality traits, and that the trait adjectives or behavioral descriptions in the first task affected the way they responded in the second task. Responses to these questions established whether any observed effects occurred outside of awareness and could, therefore, be considered automatic.

Participants then received several questions on demographics (Appendix G). After participants completed all measures, they were verbally debriefed. The lead researcher read the following statement: “Thank you for participating in this study. The purpose of this study was to understand how context affects self-perceptions. If you have further questions please email me at mn16@uakron.edu”.

75
CHAPTER IV
RESULTS

Pilot Study

One concern of the design of this study was the possibility that the measure of the proposed mediator, accessibility of episodic memories of conscientious behavior, would itself act as a prime and affect scores on the complex personality measure of conscientiousness. In order to test this possibility, a pilot study was run in which one group of participants (N = 41) was given the memory measure and another group (N = 18) was not. Both groups were given the trait prime. The procedure was otherwise identical to the one outlined in the procedure section above. When the mean scores on the complex personality measure of conscientiousness were compared between the group that did not receive the memory measure (M = 3.36) with those who did (M = 3.45), there was no significant difference, t (57) = -.49, ns. This finding suggested that the memory measure was not acting as a prime and would not inadvertently affect the scores of the complex personality measure of conscientiousness. Thus, the memory accessibility measure was given to the participants as planned.

Data Screening for Main Study

Of the 172 individuals who participated in the study, only three indicated suspicion and were removed from the study. This suspicion rate was well below the 5%
rate identified by Bargh and Chartrand (2000) as necessary for a manipulation to be considered a prime. Analysis of maximum and minimum scores for each variable indicated no out of range values. Missing data were less than 5% of the total and appeared to be random. All continuous variables, except for age, were normally distributed. Age was leptokurtic and positively skewed. Z-scores were examined for all variables in order to identify univariate outliers, which were deleted from the study. Four cases were identified as outliers on age. These cases were dropped because age was correlated with self-concept clarity (a potential confound – discussed below). Analyses were run with and without these cases and were virtually identical. One case was identified as an outlier on the CBDQ and was dropped. After screening for suspicion and univariate outliers, the final sample size was 163.

Standardized residuals, Cook’s D, and Mahalanobis Distance indicated that there were no multivariate outliers. Examination of scatterplots indicated that all relationships between continuous variables were linear. Inspection of scatterplots and f-max tests indicated no problems with homoscedasticity. Analysis of correlations indicated no multicollinearity problems.

Sample Characteristics

Sixty-three percent of the subjects were female. Eighty-four percent of the subjects identified themselves as white, 9 percent as African-American, 4 percent as Asian-American, 2 percent as Latino/Hispanic, and 1 percent as other. Age ranged from 16 to 29, with a mean of 20, and a standard deviation of 2.28.
Descriptives

As can be seen in Table 4.1, two scales had reliability scores under .7. Coefficient alpha was .63 for the Private Self-Consciousness scale and .69 for the CBDQ. In addition to reliabilities, the means and standard deviations for the full sample are reported in Table 4.1. Within condition descriptive statistics are reported in Table 4.2. Correlations comparing each priming condition to the control condition are presented in Tables 4.3 and 4.4.

Table 4.1
Descriptive Statistics for Mediators, Moderators, and Criterion for Full Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Reliability</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Primacy</td>
<td>.97</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>2. Frequency</td>
<td>.93</td>
<td>1.16</td>
<td>.97</td>
</tr>
<tr>
<td>3. Private Self-Consciousness b</td>
<td>.63</td>
<td>3.37</td>
<td>.49</td>
</tr>
<tr>
<td>4. Self-Concept Clarity b</td>
<td>.84</td>
<td>3.34</td>
<td>.70</td>
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<tr>
<td>5. CBDQ b</td>
<td>.69</td>
<td>3.30</td>
<td>.49</td>
</tr>
</tbody>
</table>

*a* Reliability refers to interrater agreement.  
*b* Reliability refers to coefficient alpha.

Table 4.2
Descriptive Statistics by Condition

<table>
<thead>
<tr>
<th>Variable</th>
<th>Trait (N = 55)</th>
<th>Behavior (N = 55)</th>
<th>Control (N = 53)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
</tr>
<tr>
<td>1. Primacy</td>
<td>.36</td>
<td>.49</td>
<td>.29</td>
</tr>
<tr>
<td>2. Frequency</td>
<td>1.15</td>
<td>.95</td>
<td>1.13</td>
</tr>
<tr>
<td>3. Private Self-Consciousness</td>
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<td>.60</td>
<td>3.42</td>
</tr>
<tr>
<td>4. Self-Concept Clarity</td>
<td>3.35</td>
<td>.69</td>
<td>3.50</td>
</tr>
<tr>
<td>5. CBDQ</td>
<td>3.40</td>
<td>.51</td>
<td>3.30</td>
</tr>
</tbody>
</table>
Table 4.3
Intercorrelations (Trait Prime vs. Control Condition) (N = 108)

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<tbody>
<tr>
<td>1. Condition</td>
<td>____</td>
<td>-0.03</td>
<td>-0.03</td>
<td>-0.11</td>
<td>0.13</td>
<td>0.21*</td>
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<tr>
<td>2. Primacy</td>
<td>____</td>
<td>0.67**</td>
<td>-0.04</td>
<td>-0.04</td>
<td>0.17</td>
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</tr>
<tr>
<td>3. Frequency</td>
<td>____</td>
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<td>-0.01</td>
<td>0.17</td>
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<tr>
<td>4. Private Self-Consciousness</td>
<td>____</td>
<td>0.03</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Self-Concept Clarity</td>
<td>____</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. CBDQ</td>
<td>____</td>
<td></td>
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</tr>
</tbody>
</table>

*p < .05

**p < .01

Table 4.4
Intercorrelations (Behavior Prime vs. Control Condition) (N = 108)

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<thead>
<tr>
<th>Variable</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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</thead>
<tbody>
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<td>1. Condition</td>
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<td>-0.04</td>
<td>-0.02</td>
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<td>0.12</td>
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<tr>
<td>2. Primacy</td>
<td>____</td>
<td>0.68**</td>
<td>-0.02</td>
<td>-0.09</td>
<td>0.19*</td>
<td></td>
</tr>
<tr>
<td>3. Frequency</td>
<td>____</td>
<td>0.03</td>
<td>-0.01</td>
<td>0.27*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Private Self-Consciousness</td>
<td>____</td>
<td>0.17</td>
<td></td>
<td></td>
<td></td>
<td>0.03</td>
</tr>
<tr>
<td>5. Self-Concept Clarity</td>
<td>____</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.19</td>
</tr>
<tr>
<td>6. CBDQ</td>
<td>____</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*p < .05

**p < .01

Before discussing the tests of hypotheses, it is important to note a potential confound. As can be seen in Table 4.4, condition and self-concept clarity are significantly correlated. As can be seen in Table 4.2, scores on the measure of self-concept clarity were higher in the behavior prime condition (M = 3.50) than in the control condition (M = 3.16). This difference was significant $t_{(106)} = 2.49$, $p < .05$. Since the measure of self-concept clarity was completed prior to exposure to the prime, these differences indicate that, despite random assignment, individuals in the behavior prime and control conditions differed on this variable prior to the manipulation. It is difficult to
understand how this could have occurred since participants were randomly assigned to condition. Specifically, when the researchers entered a class, they brought an equal number of packets for each condition and these packets were organized such that every three packets handed out contained one packet from each of the conditions. It was originally thought that a few outliers might be driving the effects, but even after all outliers were deleted, the effects remained. All of the following analyses which compared the behavior prime condition to the control condition were conducted as planned and then also run including self-concept clarity as a control variable.

Hypotheses Tests

Hypothesis 1 predicted that exposure to conscientiousness trait terms would increase scores on a complex personality measure of conscientiousness. Simple Linear Regression was used to test this hypothesis. When scores on the CBDQ (the complex personality measure of conscientiousness) were regressed on priming condition (comparing the trait prime to the control prime) a significant effect was found (b = .21, \( t_{(106)} = 2.18, p < .05 \)). As can be seen in Table 4.2, participants who received the conscientiousness trait prime scored higher on the CBDQ (M = 3.40) than participants in the control condition (M = 3.19). Thus, hypothesis 1 was supported.

A significance cutoff value of \( p = .05 \) was chosen because the hypothesis was tested using a one-tailed test (which would have resulted in a cutoff value of .1), and a bonferroni correction. A one-tailed test was appropriate because our hypotheses were unidirectional. A bonferroni connection was used because we compared the trait prime to the control in one test (Hypothesis 1) and the behavior prime to the control in another test.
(Hypothesis 2). These tests are not independent and a bonferroni correction avoids capitalization on chance (type I error) (Hays, 1994).

Hypothesis 2 predicted that those exposed to descriptions of behaviors indicative of conscientiousness would score higher on a complex personality measure of conscientiousness. Simple Linear Regression was used to test this hypothesis. When CBDQ scores were regressed on priming condition (comparing the behavior prime to the control prime) the effect was not significant (b = .06, t(106) = 1.25, ns). Thus, Hypothesis 2 was not supported. Although the difference was not significant, mean differences were in the predicted direction; participants who received the behavior prime scored higher on the CBDQ (M = 3.30) than participants in the control condition (M = 3.19). When self-concept clarity was included as a control variable, the effect of priming condition on the CBDQ remained nonsignificant (b = .04, t(106) = .82, ns).

Four separate mediation hypotheses were tested. Hypothesis 3a predicted that accessibility of episodic memories, as operationalized by the primacy of recall of these memories, would mediate the relationship between exposure to conscientiousness trait terms and scores on the complex personality measure of conscientiousness. An examination of Table 4.3 shows that the relationship between priming condition (comparing the trait prime to the control prime)-the IV, and primacy-the proposed mediator, was not significant, suggesting a lack of mediation. In order to thoroughly test this hypothesis, a series of regression equations were run in order to test the criteria for mediation outlined by Baron and Kenny (1986) and a Sobel test of the indirect effect was also conducted (see Table 4.5). As can be seen in Table 4.5, the trait prime (the IV) does not predict primacy (the proposed mediator). According to the framework suggested by
Baron and Kenny (1986), this suggests there is no mediation. Furthermore, the Sobel test of the indirect effect is not significant, further indicating a lack of support for this mediation hypothesis.

Table 4.5
Test of Mediation for Primacy (Trait Prime vs. Control Condition) (N = 108)

<table>
<thead>
<tr>
<th>Equation</th>
<th>b</th>
<th>β</th>
<th>R²</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. DV = CBDQ</td>
<td>.04</td>
<td>.21</td>
<td>.04</td>
<td>4.79*</td>
</tr>
<tr>
<td>Trait Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.21*</td>
<td>.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. DV = Primacy</td>
<td>.00</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.03</td>
<td>-.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. DV = CBDQ</td>
<td>.07</td>
<td>.21</td>
<td>.07</td>
<td>4.16*</td>
</tr>
<tr>
<td>Trait Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.21*</td>
<td>.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primacy</td>
<td>.18</td>
<td>.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sobel Test = -.26, ns

<sup>a</sup>Trait Prime is scored 1 for exposure to trait adjectives and 0 for control.

*<i>p < .05</i>

Hypothesis 3b predicted that accessibility of episodic memories of conscientious behavior, as operationalized by the frequency of recall of these memories, would mediate the relationship between exposure to conscientiousness trait terms and scores on the complex personality measure of conscientiousness. An examination of Table 4.3 shows that the relationship between priming condition (comparing the trait prime to the control prime)-the IV, and frequency-the proposed mediator, was not significant, suggesting a lack of mediation. In order to thoroughly test this hypothesis, a series of regression equations were run in order to test the criteria for mediation outlined by Baron and Kenny (1986) and a Sobel test of the indirect effect was conducted (see Table 4.6). As can be seen, the trait prime (the IV) does not predict frequency (the proposed mediator).
According to the framework suggested by Baron and Kenny (1986), this suggests there is no mediation. Furthermore, the Sobel test of the indirect effect is not significant, further indicating a lack of support for this mediation hypothesis. Figure 4.1 presents all of the mediation paths for the two proposed mediators of the trait prime effect on CBDQ scores. The trait prime does have a direct effect but this effect is not mediated by either measure of memory accessibility.

<table>
<thead>
<tr>
<th>Equation</th>
<th>b</th>
<th>β</th>
<th>R²</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>4. DV = CBDQ</td>
<td>.04</td>
<td>.21*</td>
<td>.21</td>
<td></td>
</tr>
<tr>
<td>Trait Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.21*</td>
<td>.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. DV = Frequency</td>
<td>.00</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-.06</td>
<td>-.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. DV = CBDQ</td>
<td>.09</td>
<td>5.37*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td>.21*</td>
<td>.21</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>.12*</td>
<td>.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sobel Test = -.29, ns</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Trait Prime is scored 1 for exposure to trait adjectives and 0 for control.
*<i>p < .05</i>
Hypothesis 4a predicted that accessibility of episodic memories of conscientious behavior, as operationalized by the primacy of recall of these memories, would mediate the relationship between exposure to descriptions of conscientious behavior and scores on the complex personality measure of conscientiousness. An examination of Table 4.4 shows that the relationship between priming condition (comparing the behavior prime to the control prime)-the IV, and primacy-the proposed mediator, was not significant, suggesting a lack of mediation. A series of regression equations were run in order to test the criterion for mediation outlined by Baron and Kenny (1986) and a Sobel test of the indirect effect was conducted (see Table 4.7). As can be seen, the behavior prime (the IV) does not predict primacy (the proposed mediator) or the CBDQ (the DV). According to the framework suggested by Baron and Kenny (1986), this suggests there is no mediation. Furthermore, the Sobel test of the indirect effect is not significant, further
indicating a lack of support for this mediation hypothesis. This set of regression analyses was also conducted with self-concept clarity as a covariate (see Table 4.8).

Table 4.7
Test of Mediation for Primacy (Behavior Prime vs. Control Condition) (N = 108)

<table>
<thead>
<tr>
<th>Equation</th>
<th>b</th>
<th>β</th>
<th>R²</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. DV = CBDQ</td>
<td>.02</td>
<td>1.56</td>
<td>.06</td>
<td>.12</td>
</tr>
<tr>
<td></td>
<td>Behavior Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. DV = Primacy</td>
<td>.01</td>
<td>1.16</td>
<td>-.05</td>
<td>-.10</td>
</tr>
<tr>
<td></td>
<td>Behavior Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. DV = CBDQ</td>
<td>.06</td>
<td>3.22*</td>
<td>.07</td>
<td>.14</td>
</tr>
<tr>
<td></td>
<td>Behavior Prime&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Primacy</td>
<td>.21*</td>
<td>.21*</td>
<td></td>
</tr>
</tbody>
</table>

Sobel Test = -.95, ns

<sup>a</sup>Behavior Prime is scored 1 for exposure to descriptions of trait-relevant behaviors and 0 for control.

<sup>*</sup>p < .05
Hypothesis 4b predicted that accessibility of episodic memories of conscientious behavior, as operationalized by the frequency of recall of these memories, would mediate the relationship between exposure to descriptions of conscientious behavior and scores on the complex personality measure of conscientiousness. An examination of Table 4.4 shows that the relationship between priming condition (comparing the behavior prime to the control prime)-the IV, and frequency- the proposed mediator, was not significant, suggesting a lack of mediation. In order to thoroughly test this hypothesis, a series of regression equations were run in order to test the criterion for mediation outlined by Baron and Kenny (1986) and a Sobel test of the indirect effect was conducted (see Table 4.8).
4.9). As can be seen, behavior prime (the IV) does not predict frequency (the proposed mediator) or the CBDQ (the DV). According to the framework suggested by Baron and Kenny (1986), this suggests there is no mediation. Furthermore, the Sobel test of the indirect effect is not significant, further indicating a lack of support for this mediation hypothesis. This set of regression analyses was also conducted with self-concept clarity as a covariate in each model (see table 4.10). As can be seen in Figure 4.2, the behavior prime did not have a direct effect on the CBDQ, nor did it have an indirect effect on the CBDQ through accessibility of memories. This contrasts with our findings for the trait prime, which did have a direct effect on responses to the CBDQ. In neither case did the prime affect accessibility of memories. Accessibility of memories did affect scores on the CBDQ, but this contribution was independent of the priming effects. Thus, no mediation effects of any kind were found.

Table 4.9
Test of Mediation for Frequency (Behavior Prime vs. Control Condition) (N = 108)

<table>
<thead>
<tr>
<th>Equation</th>
<th>b</th>
<th>β</th>
<th>R²</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>13. DV = CBDQ</td>
<td>.02</td>
<td>.12</td>
<td>.06</td>
<td>1.56</td>
</tr>
<tr>
<td>Behavior Prime</td>
<td>.06</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. DV = Frequency</td>
<td>.00</td>
<td>.17</td>
<td>-.04</td>
<td>-.04</td>
</tr>
<tr>
<td>Behavior Prime</td>
<td>.06</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>.14*</td>
<td>.28*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. DV = CBDQ</td>
<td>.09</td>
<td>5.19*</td>
<td>.06</td>
<td>.12</td>
</tr>
</tbody>
</table>

Sobel Test = -.40, ns

*aBehavior Prime is scored 1 for exposure to descriptions of trait-relevant behaviors and 0 for control.

*p < .05
Table 4.10  
Test of Mediation for Frequency (Behavior Prime vs. Control Condition) Controlling for Confound (N = 108)

<table>
<thead>
<tr>
<th>Equation</th>
<th>b</th>
<th>β</th>
<th>$R^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>16. DV = CBDQ</td>
<td>.04</td>
<td>.08</td>
<td>.04</td>
<td>2.18</td>
</tr>
<tr>
<td>Behavior Prime$^a$</td>
<td>.04</td>
<td>.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Concept Clarity</td>
<td>.11</td>
<td>.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. DV = Frequency</td>
<td>.00</td>
<td>.08</td>
<td>.00</td>
<td>.04</td>
</tr>
<tr>
<td>Behavior Prime$^a$</td>
<td>-.04</td>
<td>-.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Concept Clarity</td>
<td>.00</td>
<td>.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. DV = CBDQ</td>
<td>.12</td>
<td>.28</td>
<td>.14*</td>
<td>4.60*</td>
</tr>
<tr>
<td>Behavior Prime$^a$</td>
<td>.04</td>
<td>.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>.14*</td>
<td>.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-Concept Clarity</td>
<td>.11</td>
<td>.17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sobel Test = -.39, ns

*Behavior Prime is scored 1 for exposure to descriptions of trait-relevant behaviors and 0 for control.

*p < .05
Hypotheses 5 through 8 involved testing complex patterns of mediated moderation. Since no mediating effects were found, it is more appropriate to test simple moderation. To discover whether or not self-concept clarity or private self-consciousness moderated the effect of the conscientiousness primes on responses to the complex personality measure of personality, 4 separate regression analyses were conducted (see Table 4.11). No significant interactions were found for either moderator in either priming comparison.
Table 4.11
Tests of Moderation

<table>
<thead>
<tr>
<th>Equation (DV = CBDQ)</th>
<th>b</th>
<th>β</th>
<th>R²</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trait Prime&lt;sup&gt;a&lt;/sup&gt; (N = 108)</td>
<td>.19*</td>
<td>.19*</td>
<td>.06</td>
<td>2.19</td>
</tr>
<tr>
<td>Self-Concept Clarity</td>
<td>.09</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Prime*Self-Concept Clarity</td>
<td>.01</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Behavior Prime&lt;sup&gt;b&lt;/sup&gt; (N = 108)</td>
<td>.04</td>
<td>.04</td>
<td>.04</td>
<td>1.49</td>
</tr>
<tr>
<td>Self-Concept Clarity</td>
<td>.08</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior Prime* Self-Concept Clarity</td>
<td>.03</td>
<td>.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Trait Prime&lt;sup&gt;a&lt;/sup&gt; (N = 108)</td>
<td>.23*</td>
<td>.23*</td>
<td>.08*</td>
<td>3.14*</td>
</tr>
<tr>
<td>Private Self-Consciousness</td>
<td>.11</td>
<td>.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trait Prime*Private Self-Consciousness</td>
<td>.11</td>
<td>.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Behavior Prime&lt;sup&gt;b&lt;/sup&gt; (N = 108)</td>
<td>.06</td>
<td>.12</td>
<td>.02</td>
<td>.59</td>
</tr>
<tr>
<td>Private Self-Consciousness</td>
<td>.08</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Behavior Prime*Private Self-Consciousness</td>
<td>-.05</td>
<td>-.06</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup>Trait Prime is scored 1 for exposure to trait adjectives and 0 for control. <sup>b</sup>Behavior Prime is scored 1 for exposure to descriptions of trait-relevant behaviors and 0 for control.

*p < .05

Exploratory Analyses

To briefly summarize the above findings, exposure to conscientiousness trait primes increased scores on a complex personality measure of conscientiousness, while exposure to descriptions of conscientious behavior did not, and no evidence of mediation or moderation was found.
*Reverse-coded items.*

The regression analyses reported in Tables 4.5, 4.6, 4.7, 4.8, and 4.9 were conducted again with the reverse-coded items removed from the CBDQ scale because it was felt that the primes may affect positively and negatively coded items differently. The results of these additional analyses were essentially identical with the exception that when CBDQ scores were regressed on priming condition (comparing the behavior prime to the control condition) the effect was significant ($b = .12$, $t_{(106)} = 2.24$, $p < .05$ (see Figure 4.3)). When CBDQ scores were regressed on priming condition (comparing the trait prime to the control condition), the effect remained significant but was stronger ($b = .27$, $t_{(106)} = 2.49$, $p < .05$). Primes appeared to have a much stronger effect on positively-coded items than negatively-coded items.

![Diagram](image-url)

*Figure 4.3*
Standardized Regression Weights for Mediation Paths When CBDQ Contains Only Positively Coded Items (Behavior Prime vs. Control)
Alternate scoring of accessibility of memories measure.

It was suggested that an alternate scoring scheme for the accessibility of memories measure might allow for a better test of the mediation hypotheses. Three changes were made. First, for the primacy measure, points were assigned for when in the list of memories, the first conscientious memory appeared (3 points if the first memory listed was a memory of conscientious behavior, 2 points if the second memory listed was a memory of conscientious behavior, 1 point if the third memory listed was a memory of conscientious behavior, and 0 points if no memories listed were of conscientious behavior). It is important to note that although no limit to the number of memories that could be listed was given, the instructions asked for “at least 3”, and over 85% of the participants listed 3 memories or less. As was found in the original analyses, neither of the primes predicted this new measure of primacy.

Second, for the frequency measure of memory accessibility, a ratio of memories of conscientious behavior to total memories listed was used instead of a simple count of the number of memories of conscientious behavior. Additionally, the ratio of memories of non-conscientious behavior to total memories listed was created. This could be seen as a measure of potential contrast effects. As was found in the original analyses, neither of the primes predicted either of these new measures of frequency. It is also interesting to note that off the memories listed, 36% were of conscientious behavior, 11% were of non-conscientious behavior, and 53% were of memories that were irrelevant or ambiguous with regards to conscientiousness.

Finally, these two measures were transformed into z-scores, and then combined in order to create a single accessibility of memories measure. Analyses were then rerun

93
using this new measure. Once again, neither of the primes predicted accessibility of memories.

_Dosage variable for behavior prime._

A review of the answers given to the word scrambles in the behavior priming manipulation indicated that only 44% of participants correctly solved all 4 of the priming items. For the items that were not solved correctly, it was difficult to say whether or not the participant was primed. Therefore, it was felt that a better test of hypothesis 2 might be to assign a point for each prime item that was correctly solved, creating a kind of dosage variable (although it is important to note that this is not a true dosage IV as participants were not randomly assigned to condition and the number of items solved correctly probably correlates with important individual differences such as general mental ability) and regressing CBDQ scores on this newly scored IV. When this analysis was run, no significant effect was found.

_Suspicion check._

A variable was created based on affirmative or negative responses to the first suspicion check question (see Appendix G) and this variable was included as a moderator variable when regressing scores on the CBDQ on priming condition. While an affirmative to question 1 of the suspicion check did not, in most cases, indicate that the participant was aware of the prime and it’s connection to the dependent variable, it was felt that, in light of findings on contrast effects (Lombardi et al., 1987) suspicion of any kind might influence the results. When the regression equations for hypotheses 1 and 2 were rerun with indication of suspicion on question 1 as a moderator, the interaction term
was not significant, indicating that suspicion (assessed using answers to item 1) did not moderate the priming effects.

*Prime vs. control.*

In order to see if an increase in power might allow more effects to reveal themselves, exploratory analysis combining the trait and behavior primes were conducted. When the trait prime and the behavior prime were combined into a single prime condition and the hypotheses were rerun, the effect of priming condition on the personality measure was significant (b = .16, t(161) = 1.99, p < .05). This effect was, as one would expect, stronger than the comparison of behavior primes to the control condition but weaker than the comparison of trait primes to the control condition. All other effects remained non-significant.
CHAPTER V
DISCUSSION

The priming literature has been clear about the fact that subtle environmental cues can change perceptions and behavior, and these changes may occur without the knowledge of the perceiver (Higgins et al., 1977; Bargh et al., 1996; Bargh & Chartrand, 2000). Recent studies have indicated that these cues may also impact self-perceptions (Stapel & Blanton, 2004; Stapel & Koomen, 2001). This study expanded on these findings and has important theoretical implications.

This study has demonstrated that primes are capable of affecting self-perceptions not only when personality is measured with simple trait adjective scales, but also when it is measured with complex personality measures. Since there were several reasons to believe that complex personality measures, which are more specific and less open to interpretation, would be more resistant to priming, this finding underscores the potency and ubiquity of priming. Changing self-perceptions of personality measured with a trait-adjective scale by exposing people to trait adjectives almost seems like a straw man, but changing self-perceptions measured with the kind of specific, complex items we rely on in the real world is another matter.

This study has also added to the literature on the self-concept. As discussed above, a number of researchers have argued that the self-concept is dynamic and fluid and that it may be influenced by cues in the environment (Musswieler & Bodenhausen,
This research supports this perspective by demonstrating that self-perceptions are altered by very subtle cues in the environment without the awareness of the individual. This study, along with previous findings regarding the malleability of the self-concept, has profound implications for our understanding of the self. To know that our very sense of who we are can be significantly changed at any time without our awareness is, perhaps, disturbing but also very interesting. While it’s important to remember that the differences in self-perceptions of personality in this study were not massive (accounting for around 4% of the variance in responses) and that it is unclear how long the priming effects we observed will last, the fact that they could be changed in a measurable way merely by exposing people to a few well-chosen words is impressive.

This study does not indicate that the self is completely malleable. The self, that pattern perceptions and behavior, does have a substantial degree of stability. What this study, along with other priming research, indicates is that the self may be, at least temporarily, altered in meaningful ways through exposure to subtle contextual cues.

The present study attempted to see if subtle environmental cues, such as those included in the recruitment portion of organizational websites, affected the way respondents completed complex personality self-reports that might be used to screen applicants. The results of this study indicate that decisions about what to include in recruitment potions of organizational websites matter. Subtle differences in language may have practically significant and completely unintended effects on how applicants respond to questions on a subsequent personality measure. Specifically, exposure to trait
adjectives, such as “organized” or “professional” may alter the way respondents answer personality questions assessing traits which are related to these adjectives.

Behavior Primes

Hypothesis testing did not find that exposure to descriptions of trait-relevant behavior such as “he completes the assignment” caused significant changes in responses to a complex personality measure (however, it is important to recall that behavior primes did affect positively coded items). Although the priming literature suggests that trait-relevant behaviors may act as primes in a manner very similar to trait adjectives (Newman & Uleman, 1993; Srull & Wyer, 1979; Uleman et al., 1996), these effects may be weaker and less likely to produce significant effects for a number of reasons. First, although there is evidence that individuals automatically process trait-relevant behaviors in terms of traits, this additional step may require more cognitive resources and, thus, be weaker.

Also, in the present study, participants had to correctly solve the word scrambles in order to be exposed to the behavior prime (this was not the case for the trait adjective prime – as long as participants read all of the words in the word scramble, they were exposed to the prime). While the word scrambles were designed to be very easy, allowing all participants to solve them and be exposed to the prime, analyses indicated that only 44% of participants correctly solved all four of the items which contained primes. Scrutiny of the items indicated that an unintended correct solution was possible to one of the items (item 7, see Appendix D) while another item proved confusing probably due to the absence of a subject (item 9: the sentence was a command and the
implied subject was “you”). Thus, instead of receiving 4 primes, it could be argued that many participants were exposed to 3 or 2 primes, which would be expected to weaken the priming effect. This may explain the lack of a significant effect in this particular study.

Reverse-Coded Items

Despite the lack of support for the behavior prime hypotheses, exploratory analyses indicated that these behavior primes do alter responses to positively-coded personality questions but not negatively-coded questions. A similar pattern was seen for trait adjective primes, such that the effect of these primes was stronger on positively-coded than reverse-coded items. Thus, when participants were primed with conscientiousness adjectives or conscientious behaviors, they answered questions indicative of conscientiousness more positively (ex. “How likely are you to write down appointments or events in a calendar?”), but answers to questions indicative of being lazy (“In the past, how often have you failed to accomplish a list of tasks because you didn’t plan enough time for each one?”) were unaffected or less affected. Presumably, we would have seen effects on the reverse-coded items if we had used “reverse-coded” primes (e.g. “lazy”).

Why are there differences for reverse-coded and positively-coded items? It’s possible that primes made prime-consistent memories more accessible but did not make prime inconsistent memories less accessible. Accepting this explanation is difficult, of course, because we did not find any changes in memory accessibility.

Another possibility is that the primed concept (conscientiousness) became more active without decreasing the accessibility of prime-inconsistent concepts, and the mere
activation of the concept affected answers to relevant questions. This explanation would assume that seemingly opposite concepts (such as conscientiousness and laziness) are, in a sense, independent, and the level of activation of one pole can be increased without decreasing the other.

The moderating effect of reverse-coding appears to be a new, and potentially interesting, find in the priming literature. Other priming studies have used reverse-coded items when testing for changes in self-perceptions (Stapel & Koomen, 2000a; Stapel & Koomen, 2001) but did not separately analyze the effects of primes on these items. The finding is of value because it may suggest a way to mitigate, or at least minimize, priming effects on personality measures.

The use of reverse-coded items has a long and controversial history in the psychological measurement literature. Many authors have recommended including reverse-coded items to counteract acquiescence response sets (Cloud & Vaughan, 1970) which some experts have argued are pervasive and detrimental to validity (Cronbach, 1946; 1950). Other authors have cautioned against using reverse-coded items because their inclusion may lower scale reliability and, in some cases, criterion-related validity (Barnette, 2000; Schriesheim & Hill, 1981; Schriesheim, Eisenbach, & Hill, 1991). Additionally, research using factor analysis has shown that inclusion of reverse-coded items may adversely affect the factor structure of scales (Pilotte & Gable, 1990). Some researchers have gone so far as to suggest that, although logically and intuitively related, reverse-coded items may in fact be measuring different constructs from their positively-coded counterparts (Pilotte & Gable, 1990; Weems & Onwuegbuzie, 2001).
The present research may add yet another layer to this ongoing conflict. On the one hand, the present study may lend additional evidence to support the idea that reverse-coded items may be measuring a different construct. In this case, the evidence is indirect, but the fact that one category of items is affected by primes while another is not appears to suggest that there are important differences in what these items are measuring. From this perspective, caution concerning the use of reverse-coded items seems in order. On the other hand, including reverse coded items may serve to protect the integrity of scales from some unintended priming effects. Thus, reverse coded items may be beneficial, not only for reducing acquiescent response sets but also for reducing unwanted priming effects. Although this study is unlikely to lead to a consensus on whether the use of reverse-coded items is advisable, it should lead researchers and practitioners to be more hesitant to abandon something which is so potentially useful.

Effect Size

Comparison of standardized means of the CBDQ scores of participants who received the trait prime to control participants, resulted in an effect size of 2.2. Running the same test but only examining the mean of the positively-coded CBDQ items, resulted in an effect size of 2.5. Comparison of the standardized means of the CBDQ scores of participants who received the behavior prime to control participants, resulted in a non-significant effect. Running the same test but only examining the mean of the positively-coded CBDQ items, resulted in an effect size of 2.2. There are no studies (which the author could find) which compare the effect of a scrambled sentence task including trait
terms or behavior terms to a control group on self-perceptions of personality but the following studies have important similarities.

Several studies used an IV and a DV similar to those used in the present study. Stapel and Koomen (2000b) had participants who completed a scrambled sentence task with positive traits and participants who completed a scrambled sentence task with negative traits rate the personality of a target individual on a trait adjective scale in a series of studies and found the following effect sizes (standardized mean differences): 4.8, 2.3, 2.4. Because Stapel and Koomen (2000b) were comparing people primed with a trait to people primed with the opposite trait (as opposed to a control group – as in the current study), the effect sizes might be expected to be substantially larger. Regarding the DV, one might argue that based on previous research, the effects of primes on self-perceptions are likely to be as large as, or larger than, the effects of primes on perceptions of others (Stapel & Blanton, 2004; Kawakami, Dovidio, & Dijksterhuis, 2003). Stapel and Koomen (2000a) examined the effect of trait primes on self-perceptions measured with a trait adjective scale, although they used a somewhat different prime (a word puzzle task). In two studies, they found an effect size of 3.1 and a non-significant effect when comparing participants primed with a trait to participants primed with the opposite trait. Again, the comparison between two opposite primes may create a bigger standardized mean difference than a comparison between one prime and a control group. Also, the primes used in the Staple and Koomen (2000a) studies were more semantically related (sometimes identical) to the words used in trait adjective personality measures which would tend to inflate effect sizes.
In one study that did use a control group, but had a DV that differed substantially from the one in this study, Bargh, Chen and Burrows (1996) measured behavior of a group that had completed a scrambled sentence task with trait primes to participants who received neutral primes and found an effect size of 2.4. It is important to note, however, that Bargh et al. (1996) specifically cautioned against comparing effect sizes found in studies using behavioral dependant variables to research that uses different dependant variables (i.e. the present research).

Several studies have examined the impact of other types of primes (different IV’s) on self-perceptions (similar DV). Stapel and Koomen (2001) primed participants with a story about a person who exemplified one pole or the other on a number of traits and then had participants rate themselves on these traits. They did not find any significant effects, except when the self was activated using manipulations not found in the present study. Stapel and Blanton (2004) subliminally primed participants with photographs associated with certain characteristics and then had people rate themselves on these characteristics. They found effect sizes of 2.1, 2, 2.7, and 2.7 when comparing a group primed with one characteristic to a group primed with the opposite characteristic. Again, these effect sizes would be expected to be larger than our own due to the fact that the comparison was between groups which received opposite primes, as opposed to between a primed group and a control group. So, the effect size found in the present study seems, on the whole, similar to effect sizes found in research using a similar paradigm. This is important because this study used a complex personality measure and, as discussed above, one might predict that effects would be weaker on these kinds of personality measures.
Mediation

Why did the mediation not work? Neither of the primes had a significant effect on the accessibility of conscientiousness memories, as measured by primacy and frequency. This, despite the fact that the conscientiousness trait primes did have an effect on responses to a complex personality measure of conscientiousness. There are at least two plausible explanations for these findings. First, memory accessibility may have been affected, but this change was not picked up by the instrument used. Second, primes may affect self-perceptions without affecting the accessibility of memories.

The measure of memory accessibility used in this study was modeled after the one used in Sanitioso et al. (1990). Recall that in that study, participants who were led to associate one pole of bipolar trait dimension with success listed memories consistent with that trait first and more often than participants led to associate the opposite pole with success. Why were effects seen in Sanitioso et al. (1990) but not in the present study? Sanitioso et al. (1990) used the words “extroversion” and “introversion” in the manipulation and “shy” and “outgoing” in the memory accessibility measure. The authors used traits that were very similar in meaning (but not identical in order to minimize suspicion concerning any link between the manipulation and the accessibility measure).

In the present study, “hardworking”, “organized”, “professional”, and “productive” were the trait prime words, “he completes the assignment”, “she arrives on time”, “they follow the schedule”, and “carry out the plans” were the behavior primes while “laid-back/structured” were the words used in the memory accessibility measure.
A review of the memories listed by participants in the present study showed that many participants interpreted the term “laid-back” to refer to an emotional state similar in meaning to stress-free, or as adaptable, instead of the intended meaning: lazy, unorganized, or unstructured. In fact, slightly more than half of the memories listed were irrelevant or ambiguous with regards to the conscientiousness of the participant. It’s possible that the similarity between the manipulation words and the memory accessibility words was greater in the Sanitioso et al. (1990) study than in the present study. A very high degree of similarity between the manipulation terms and the terms in the memory accessibility measure may be necessary in order to see an effect and because the primes in this study differed from the terms used in the memory accessibility measure by a relatively high degree, no effects were found.

It was a struggle to find the right terms for the accessibility measure. The terms had to be similar in meaning to the primes; however, identical terms needed to be avoided in order to reduce suspicion. It was also felt that the terms should be common and easy to understand. Finally, it was thought desirable to use terms that were not value-laden and to avoid negatively charged terms such as ‘lazy’ and ‘unorganized’. The attempt to satisfy all of these constraints may have led to the selection of terms that were not close enough in meaning to the primes.

Future research may want to examine the effects of manipulations on a variety of memory accessibility items containing terms which vary in the degree of similarity to the terms used in the manipulation. Using several items may also provide for a more reliable measure. A measure with several items has its’ own problems, however. It would be
more time-consuming, more susceptible to fatigue effects, responses to the first items on
the measure may affect responses to later items, and it would be more difficult to avoid
suspicion that the manipulation and the accessibility of memory measure were linked.
However, this type of measure may be necessary in order to find effects of primes on
memory accessibility. Alternate measures of memory accessibility, such as response
latency for memory generation (Mussweiler & Bodenhausen, 2002; Sanitioso et al.,
1990) may also be helpful in exploring the possible effects of primes on memory
accessibility.

Another explanation of the results is that primes don’t affect memory
accessibility. It may be that manipulations like biased questions (Fazio et al., 1981;
Kunda et al., 1993) and associating a particular trait with success (Sanitioso et al., 1990)
do affect memory accessibility, but subtle primes, such as the ones used in the present
study, are too weak. This seems to be the position held by Klein & Loftus (1993b) and
discussed at length above. It is important to reiterate, however, that in the present study,
the trait primes did affect self-perceptions, a result difficult to reconcile with the Klein et
al. perspective.

Although, this study failed to find support for mediation, it is worthwhile to note
that accessibility of memories of conscientious behavior were significantly correlated
with responses on a complex personality measure of conscientiousness. This finding is
logical and underscores the link between accessibility of trait-relevant episodic memories
and self-perceptions as measured by complex personality items. While this finding may
seem obvious (if you can recall more instances in which you behaved in a conscientious
manner, you will rate yourself higher on items assessing conscientiousness), it seems to contradict the model of self proposed by some researchers (Klein & Loftus, 1993b; see discussion above).

Moderators

Why didn’t self-perceived malleability or private self-consciousness moderate the relationship between the manipulation and memory accessibility? Why did they fail to moderate the relationship between manipulation and the CBDQ? These factors have been shown to moderate priming effects in previous research. Self-concept clarity had been shown to specifically moderate the effects of primes on self-perceptions (Stapel & Koomen, 2000a). Why did we not see the same effects in our study? Initially, one possible explanation seemed to be that Stapel and Koomen (2000a) compared individuals who scored in the top third of self-perceived malleability to those who scored in the bottom third, whereas, the present study included all individuals. When the top third of scorers on self-perceived malleability were compared to the bottom third in this study, however, no differences in the effect of the manipulation on the CBDQ were found.

The fact that this study used a complex personality measure as opposed to a trait adjective measure is an important departure from earlier research which may explain differences in effects. As discussed earlier, there was some reason to believe that complex personality measures would be less susceptible to priming effects. This might explain the failure to find moderation, except for the fact that finding a main effect indicates that complex personality measures are, like trait adjective scales, susceptible to priming. It’s difficult to understand why the differences in effects normally seen across
people who vary in terms of self-concept clarity were not seen with the complex personality measure.

One other difference between the present study and that of Staple and Koomen (2000a) is that they measured self-perceived malleability in a study held days earlier than the manipulation was given, whereas in this study, self-perceived malleability was measured immediately before the manipulation was delivered. It is not clear, however, why this would have made any difference.

Use of Pronouns in Primes

Three out of 4 the primes in both the behavior and trait conditions included a simple pronoun referring to another (he, she, or they). This may have lead participants to be less likely to apply the primes to themselves because the prime may cause them to think about the traits and behaviors in terms of others as opposed to the self. In fact, 21 of the 164 participants referred to others in the memory accessibility measure (e.g. My Spanish teacher is very relaxed when he teaches) even though the instructions clearly indicated that they were to report memories of their own behavior. Inclusion of pronouns such as the ones in our measure is not unusual (Bargh et al., 1996; Stapel & Koomen, 2000b), but the inclusion of these words may be unintentionally weakening the effect of the primes on self-concept. We may have seen more of an effect if the primes had not included words used to refer to others. Stapel, Koomen, and VanderPlight (1996) found that simple pronouns referring to others (as opposed to proper names and pictures of others) did not draw enough attention to the referenced other to cause contrast effects, but these terms may be strong enough to prevent some people from applying the primed
concept to the self. The effect may have been especially strong if the primes had included personal pronouns (I, me, we) because the primes might cue people to think about the trait terms or behaviors as connected to the self.

Potential Applications for Findings

The potential applications of this finding are numerous given the varied settings in which personality self report measures are used. One can easily think of a wide variety of possible applications. For example, could priming be used to alter self-perceptions in a counseling setting? Or, what about education or training - might we use priming to increase self-confidence or self-efficacy or other variables which might play an important role? Might we shape work environments through continuous priming? For that matter, is continuous priming a mechanism through which people inadvertently affect each other all the time? Are workers continually priming each other, leading to increasing similarity in terms of personality and other variables? Is organizational culture spread through priming? Are leaders affecting subordinate personality through priming?

Other questions also immediately leap to mind. For example, is it ethical to alter self-perceptions through priming? Self-perceptions are normally thought of as something private, but it appears that we can change this very personal construct without the consent, or even the knowledge, of the target. Is this brainwashing? It almost seems like something out of dystopian nightmare. The results of this line of research forces us to grapple with these issues.

This research has also added to the personality literature. Specifically, this study has highlighted another factor that may be leading to low criterion-related validities for
complex personality measures. While previous research has focused on conscious faking (McFarland & Ryan, 2000; Snell et al., 1999), this study indicates that automatic unconscious processes may also be influencing the way individuals complete personality measures. By demonstrating that primes can affect the kind of personality measures actually used in most personality research, this study serves as a bridge between the priming literature and the personality literature. This research should, at least, cause personality researchers to think about primes that may be present in various test administration contexts. It may be impossible to completely eliminate primes from the testing environment, but attempts to minimize potentially harmful primes seem to be in order. Practitioners may also benefit from exploring ways in which priming may be used to increase the validity of personality measures. As mentioned earlier, research has indicated that altering instructions using the team-oriented instruction sets (Nordlund & Snell, 2006) and frame-of-reference manipulations (Schmit et al., 1995) can lead to increases in criterion-related validity (and these methods may be effective, in part, because of priming) and that priming honesty may lead to more honest responding (Rasinkski, 2005) (which should also increase criterion-related validity).

This study also has a number of important practical implications. The potential impact of primes has been largely ignored in IO literature. This is unfortunate because IO psychologists often make use of personality self-reports (Hough & Ones, 2001) which may be susceptible to unintended priming effects.

For example, organizations are increasingly engaged in online screening, using online versions of selection instruments linked to organization websites to filter
applicants (Chapman & Webster, 2003; Jones & Dages, 2003; Lievans, Van Dam, & Anderson, 2002). Cober, Brown, and Levy (2004) recently found that 94% of the organizations on Fortune’s 2001 list of “Best Companies to Work For” had an employment web site and that 100% of the organizations on Fortune’s 2002 list of “Best Companies to Work For” had an employment web site. When Cober et al. (2004) surveyed these websites using a typology suggested by Williamson, Lepak, and King (2003) they found that about a third of the websites were dual-purpose (meaning they focused on both recruitment and screening). When organizations attempt to integrate recruitment and selection on organizational websites in this manner, a number of choices have to be made concerning which information to include and the language that should be used to convey this information. For example, should current employees and the existing organizational culture be described? A cursory review of organizational websites found a good example of one organization attempting to do this; REI told prospective applicants, “If you'd like to work for a leader in the industry, be rewarded for initiative and creativity, and balance working smart with time off to play ... come join us!,” and had the following words in bold, large font at the top of the recruitment portion of their organizational website: “passion, pride, integrity, fun”. It seems likely that a number of organizations are unintentionally priming applicants. Based on the results of this study, we can conclude that these primes have the potential to affect the way these applicants are responding to complex personality measures taken as part of the screening process.
Limitations

One limitation of this study is the low external validity. It was felt that a highly controlled lab study was necessary in order to provide initial evidence for the phenomenon, but research in real-world situations is necessary before firm conclusion can be made about the presence of the phenomenon in applied settings. It is also important to note that the sample used for this study was relatively homogeneous. The study would need to be replicated with individuals of various age groups, ethnic groups, and cultures in order to establish the generalizability of the phenomenon.

Another limitation was the lack of a manipulation check. A manipulation check was not used for fear that the manipulation check might, itself, act as a prime or tip of participants to the connection between the two, ostensibly unrelated, studies. It seems logical to deduce that the trait prime did, in fact, work because of the differences seen in responses to the CBDQ across conditions. The evidence for the efficacy of the behavior prime is more ambiguous and a manipulation check of some kind would have been helpful here.

As discussed earlier, there were a number of issues pertaining to the measurement of the accessibility of episodic memories. The chances of finding a significant effect would likely have increased if the measure used had contained more items and used adjectives which were more similar to the priming adjectives. Furthermore, the use of a trait with poles that were more balanced in terms of social desirability (e.g. extroversion) may have been beneficial.
As has been mentioned previously, the behavior prime may have been weaker than the trait prime for several reasons. In future research, care must be taken to insure that all items are easy enough that they will be successfully answered by the vast majority of subjects and that the only correct answer includes the prime.

The present study made use of a 12 item prime with a ratio of 1 prime for every 3 filler items. A search of through studies which have used similar priming measures shows that the number of total items, and the percentage of prime items per scale has varied wildly from one study to another. Some studies have used 8 items (Sedikides, 1990) while others have used 60 items (Srull, & Wyer, 1979, 1980). In some studies, 5% of the items have been prime items (Higgins, Bargh, & Lombardi, 1985), while in others 100% of the items have been prime items (Sedikides, 1990). The available evidence indicates that the longer the manipulation (if the percentage of primes are kept constant) and the higher the percentage of primes, the stronger the priming effect (Bargh & Chartrand, 2000; Srull & Wyer, 1979, 1980). However, the higher the percentage of primes, the higher the chances of causing suspicion among the participants (Bagh & Chartrand, 2000). Although Bargh and Chartrand (2000) do not make mention of this, the overall length of the manipulation may also have an effect on levels of suspicion.

Thus, one should attempt to use the shortest measure and the lowest percentage of primes which have been shown to result in adequate effect sizes. There is no consensus concerning how much is enough and how much is too much. Different researchers seem to habitually use a certain length: Bargh seems to like 20 to 25 items, Srull and Wyer like 30 to 50, while others use 12 or 13 items (Thompson et al., 1994; Stapel & Koomen,
and no one mentions why they chose that particular length or whether it is better or worse than other lengths. Generally, the same can be said for percentage of primes. Ideally, one would want to do a meta-analysis and compare the effect sizes of the various lengths and proportions. Unfortunately, many of the relevant studies haven’t report the necessary information, and the dependent variables are often different (making comparison across studies difficult). Stapel and Koomen (2000b) used a 12 item manipulation with 4 prime items and found effect sizes of 4.8, 2.3, and 2.4 in three studies. Stapel & Koomen (2000b) used a different dependent variable than the one in the present research and they compared two different primed groups, rather than a primed group and a control group so these effect sizes were only a rough guide, but the effect sizes seemed more than adequate and the short length and modest ratio seemed to insure low levels of suspicion. Therefore, a 12 item measure with 4 primes was used in the present study. Considering the fact that suspicion rates were so low, it appears that it may have been possible to use a longer prime with a higher ratio of primes without raising suspicion to unacceptable levels. Using a stronger prime would likely have produced larger effects. This may have led to significance of the effect of behavior primes on responses to the CBDQ.

Ethical Considerations Concerning Deception

This study used deception, in that the purpose of the study was not fully made clear to participants even in the general debriefing statement read to participants at the end of the study. It was felt that the deception was necessary in order to keep from spoiling the study. People who are aware of attempts to prime are unlikely to be primed.
Furthermore, there was a fear that if the true nature of the study was described in more detail in the debriefing participants might tell other, future participants. It was also felt that the deception would not result in any harm. Because of these factors, the decision was made to use deception but it is important to note that this decision was not, and should not, be taken lightly.

Future Research

This study has laid the groundwork for several lines of future research. First, it is important to establish whether or not the changes in responding caused by primes do, in fact, result in lower criterion-related validity for personality measures. If priming does lead to decreases in criterion-related validity, it would mean that practitioners would have to give much more thought to how, when, and where personality measures are administered. If, on the other hand, priming does not lead to decreases in criterion-related validity, the effect would pose much less of a threat in applied contexts.

Second, further research with higher external validity would be useful. One might, for example, actually set up some mock organizational websites with recruitment information which included primes, and a selection portion which included a personality measure. Effects found in such a study would increase confidence that the phenomenon observed in the lab translates to the real world. It would also be beneficial to establish the parameters of the effect. How many primes are necessary? Does the effect increase with more primes? Is there any way to counteract the effect of primes? Some research has suggested that increasing accuracy motivation may decrease the effects of priming on impression formation as long as relevant information is accessible and adequate cognitive
resources are available (Thompson et al., 1994). It would be interesting to see if the priming effects observed in this study could be mitigated by attempting to increase the accuracy motivation of respondents. The present study also suggested that including reverse-coded items in a personality measure may limit the effect of primes on response. More information on how the proportion of reverse-coded items affects priming would be useful.

It would also be helpful to further explore individual differences that may affect this priming effect. This study found no evidence that private self-consciousness and self-concept clarity moderated the priming effect, but further research using these and other individual difference measures may prove informative. The process through which this priming effect occurs also merits further research. This study found no support for the hypothesis that primes affect self-perceptions by changing the accessibility of relevant memories, but it’s unclear whether this was a measurement issue or because primes work in some other way.

The fact that primes did affect personality self-reports in this study may help explain the efficacy of certain methods that have been shown to increase the criterion-related validity of personality measures. As suggested above, frame-of-reference manipulations and team-oriented instruction sets may be effective because they act as primes. This study suggests that “at work” or other tags which refer to a context may affect responses even if they are not in the instructions or appended to items. Likewise, descriptions of concepts or the behavior of individuals, as seen in team-info instructions, may influence responses to a personality measure regardless of whether or not they are
presented in the instructions or in some other way. Future research should examine whether or not mere exposure to words and phrases indicative of honesty or of a particular frame-of-reference are able to affect responses to personality measures and increase criterion-related validity.

It would also be helpful to understand whether job descriptions and other information on organization websites could be rewritten in order to minimize the effect of priming. Is it possible to convey the necessary information about the job and attract potential applicants without inducing priming? This is obviously a very important consideration when thinking about the practical applications of this research.
REFERENCES


APPENDICES
APPENDIX A

TEAM-INFO INSTRUCTIONS

Team Selection Information
When applicants are selected for this job they will be placed on a team during the probationary period. The information you provide will be used to place you on a team. Teams will contain a mix of individuals who have different strengths and weaknesses. Research has indicated that no one will be strong in every area but that the strength of one team member may act to balance the weakness of another. For example, one team member may excel at attention to detail while another team member may pay less attention to detail but be better at looking at the big picture and keeping things in context. Some team members may be more creative, while others are more analytical or practical.

Job preview A
When Josh filled out this questionnaire he tried to give answers that he thought the supervisors were looking for. He wanted to get the job and he felt that his chances of being hired would increase if he figured out what kind of person the supervisors wanted and tried to make himself look as much like that person as possible. For each question Josh asked himself “what is the ‘right’ answer to this question”, instead of “which answer best reflects me and my experiences?” Josh was hired for the job, and his answers on the questionnaire were used to place him on a team. Since Josh didn’t give the answers that best reflected himself and his experiences he was poorly placed. For example, Josh reported that he was definitely a leader because he thought that’s what the supervisors wanted and he figured that he could be a leader if he needed to, even though he didn’t have leadership experience. Josh was placed in a group that needed a leader; unfortunately Josh could not carry out this role because he didn’t have experience as a leader. Another problem arose because Josh reported that he was more detail oriented and less focused on the broader picture. Josh was put into a group that desperately needed someone who was detail oriented because the other members were all focused on the broad picture. Because Josh was ineffectively placed, he was not able to perform well and he was not offered a permanent position. If Josh had answered the questions by responding in a way that reflected his experiences, as opposed to who he thought the supervisors wanted him to be, he would have been placed in a team that was right for him.
Job preview B

When Mary filled out this questionnaire she tried to give answers that she though reflected herself and her experiences. She wanted to get the job and she felt that her chances of being hired would increase if she put answers that were consistent with herself and her experiences. For each question Mary asked herself “which answer best reflects me and me and my experiences?” instead of “what is the ‘right’ answer to this question?” Mary was hired for the job, and her answers on the questionnaire were used to place her on a team. Since Mary gave the answers that best reflected herself and her experiences she was properly placed. For example, Mary reported that she was not creative because she had not had experiences where she had played a creative role. Mary was placed in a group full of creative people; fortunately the other group member’s strengths were able to balance out Mary’s weakness. Another good match arose because Mary reported that she was more detail oriented and less focused on the broader picture. Mary was put into a group that desperately needed someone who was detail oriented because the other members were all broad picture focused. Because Mary was effectively placed she was able to perform well and was offered a permanent position. Mary answered the questions by responding in a way that reflected her experiences, as opposed to who she thought the supervisors wanted her to be. She was placed in a team that was right for her
APPENDIX B

SELF-CONCEPT CLARITY SCALE

Instructions: Using the scale below, write a number beside each question to indicate your response.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Strongly Disagree</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>Strongly Agree</strong></td>
</tr>
</tbody>
</table>

1. My beliefs about myself often conflict with one another._____  
2. On one day I might have one opinion of myself and on another day I might have a different opinion._____  
3. I spend a lot of time wondering about what kind of person I really am._____  
4. Sometimes I feel that I am not really the person I appear to be._____  
5. When I think about the kind of person I have been in the past, I’m not sure what I was really like._____  
6. I seldom experience conflict between the different aspects of my personality._____  
7. Sometimes I think I know other people better than I know myself._____  
8. My beliefs about myself seem to change very frequently._____  
9. If I were asked to describe my personality, my description might end up being different from one day to another day._____  
10. Even if I wanted to, I don’t think I would tell someone what I’m really like.
11. In general, I have a clear sense of who I am and what I am.

12. It is often hard for me to make up my mind about things because I don’t really know what I want.
APPENDIX C

PRIVATE SELF-CONSCIOUSNESS SCALE

Instructions: Using the scale below, write a number beside each question to indicate your response.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Extremely Uncharacteristic</td>
<td></td>
<td></td>
<td></td>
<td>Extremely Characteristic</td>
<td></td>
</tr>
</tbody>
</table>

1. I’m always trying to figure myself out. _____
2. Generally, I’m not very aware of myself. _____
3. I reflect about myself a lot. _____
4. I’m often the subject of my own fantasies. _____
5. I never scrutinize myself. _____
6. I’m generally attentive to my inner feelings. _____
7. I’m constantly examining my motives. _____
8. I sometimes have the feeling that I’m off somewhere watching myself. _____
9. I’m alert to changes in my mood. _____
10. I’m aware of the way my mind works when I work through a problem. _____
APPENDIX D
SCRAMBLED SENTENCE MANIPULATION

Instructions: For each set of words below, make a grammatical four word sentence and write it down in the space provided.

For example:

  flew eagle the plane around  =  The eagle flew around

Trait Term Condition

1. ball the throw toss silently
2. him was hardworking always he
3. he observes occasionally people watches
4. sky the seamless red is
5. desk the organized bird is
6. picked throw apples hardly the
7. there are they professional looking
8. send I mail it over
9. is she plant productive s
10. saw hammer he train the
11. horse rode apple the he
12. glass metal dish the is

Behavior Descriptions Condition

All items are the same as in the trait term condition with the exception of the following

2. the so completes he assignment
5. arrives clock time on she
7. the follow schedule lion they
9. plans June the out carry

Control Condition

All items are the same as in the trait term condition with the exception of the following

2. him was tall always he
5. desk the metal red is
7. there are they good looking
9. is she plant angry
APPENDIX E
ACCESSIBILITY OF MEMORIES MEASURE

Instructions: For this task you will be presented with a pair of words that represent opposite positions on a
dimension of personality. Write down specific occasions where you behaved in a way that could be described
with either of these words. You may include some memories that fit with one word and other memories which fit
with the opposite word (see the example below) or all of your memories may fit with just one of the words; just
write down whichever memories of your own behavior come to mind when you think about the pair of words.

Please list at least 3 specific memories for each question. Below is an example.

outgoing / quiet

- Last night, I just stayed in and watched a movie by myself instead of going out with my friends.
- I had a great time at the party last weekend.
- In high school, I took a new student under my wing and we became good friends.
- I wanted to ask a question in class yesterday, but I didn’t, because I was afraid of sounding stupid.
- A few days ago, I struck up a conversation with someone in the elevator.

I. humble/confident
2. laid-back / structured

3. imaginative/practica
APPENDIX F

CBDQ AND FILLER

Instructions: The following questions ask you about your behavior. Please answer them as accurately as possible. Write a number beside each question to indicate your response, using the scale below.

1 (Not at all) -- 2 (Seldom) -- 3 (Sometimes) -- 4 (Frequently) -- 5 (Very Frequently)

1. In the past, when a friend has asked you to find something (such as a mailing address, a picture, a recipe etc.) how often did you have to be reminded before you actually gave it to them? _____

2. When you have been in a frustrating interpersonal situation, how often have you been able to be patient with the person or persons causing the frustration? ______

3. In the past, how likely have you been to notice small changes, such as someone getting a haircut or shaving off a mustache? ______

4. How likely are you to leave early for appointments or meetings to make sure that you get there on time? _____

5. In the past how easy has it been for you to judge the moods of your friends, co-workers or family members?______

6. In the past, when meeting people for the first time, to what extent were you aware of the kind of impression you made? ______

7. How likely are you to write down appointments or events in a calendar? _____

8. How important has it been to you that your room or workspace was organized in line with your personal style?______

9. Compared to your classmates, how often did you participate in class discussions?______

10. In the past, how often have you failed to accomplish a list of tasks because you didn’t plan enough time for each one? ___
11. In the past, how often have you had difficulty expressing your thoughts or getting your point across?

12. To what extent have you been an outgoing and talkative person?

13. How likely are you to keep the manuals and warranties for items that you buy?

14. When socializing with a group of people, how often do you feel the group is relying on you to keep the conversation going?

15. How often do your friends seek your help on school assignments?

16. If you were pulled over, how easily would you be able to find the registration and insurance cards when asked?

17. Compared to your classmates, how easy was it for you to get good grades?

18. Relative to others, how likely have you won arguments or debates?

19. How likely are you to get “side-tracked” when you are working on a project or task, such as homework or a household chore?

20. While in high school, how often did you tend to guide or direct others in group activities?

21. In general, how often have you felt that you needed to prove yourself to others?

22. If there was a big project or task coming up, such as writing a report, how likely are you to wait until the last minute rather than spacing the work out over time?

23. How often are you a few minutes late for an appointment?

24. How often have you initiated a conversation with a stranger next to you on a bus or plane?

25. Before starting on a trip or vacation, how often do you get out maps and find the best route to your destination?

26. In high school, to what extent did your friends consider you unconventional?

27. To what extent do you agree that sometimes politeness must be sacrificed in order to make a point?

28. How often do you buy clothing that is not in season because it is usually cheaper (e.g. buy a sweater in the summer)?

29. How often do you have problems falling asleep at night because you are worried about things?
30. How much do you enjoy working on projects that require you to use your imagination?____

31. How likely are you to take longer doing a task in order to make if perfect?____

32. How well do you tend to remember details from books you've read or movies you've seen?____

33. In the past, how much have you enjoyed making your own Halloween costumes?____

34. Based on past experience, how frequently do you scrutinize bills sent to you to make sure that you have not been overcharged?____

35. How often do you attend large parties?____

36. How likely are you to attempt to cheer up a friend who is depressed?____

37. When putting something together that has directions, how likely are you to set the directions aside and put it together of your own accord?____

38. How likely are you to change your behavior in order to not hurt someone’s feelings?____

39. When someone treats you poorly how likely are you to try and get back at that person?____

40. How likely are you to organize or clean your work space before starting on a project because you can’t work with the “mess” around you?____

41. How likely are you to have doubts about your ability to accomplish a difficult task?____

42. How often do you get stressed out by minor things?____

43. How likely are you to have a box full of items (e.g. photographs) in your closet that you plan to organize but haven’t gotten around to yet?____

44. When you are going out with friends, how often are you the one who decides where to go?____

45. How often do you suspect that others are lying to you?____
APPENDIX G
FUNNELED DEBRIEFING AND DEMOGRAPHICS

1. You have just participated in two experiments. Do you think that completing the first experiment impacted your answers in the second experiment? If so, please explain.

2. Did you notice any themes in the scrambled sentence task you completed in the first experiment? If so, please explain.

DEMOGRAPHICS

Please answer the questions below about demographic information.

1. What is your age? _________

2. What is your gender? _________

3. What is your race or ethnicity? _________
APPENDIX H

IRB APPROVAL

NOTICE OF APPROVAL

Date: March 27, 2008

To: Matthew Nordlund
730 Crosby Street
Akon, Ohio 44302

From: Sharon McWhorter, IRB Administrator

Re: IRB Number 20080318
"The Effects of Priming on Personality Self-Reports: Challenges and Opportunities"

Thank you for submitting your IRB Application for Review of Research Involving Human Subjects for the referenced project. Your application was approved on March 26, 2008. Your protocol represents minimal risk to subjects and matches the following federal category for exemption:

☐ Exemption 1 - Research conducted in established or commonly accepted educational settings, involving normal educational practices.

☐ Exemption 2 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior.

☐ Exemption 3 - Research involving the use of educational tests, survey procedures, interview procedures, or observation of public behavior not exempt under category 1, but subjects are elected or appointed public officials or candidates for public office.

☐ Exemption 4 - Research involving the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens.

☐ Exemption 5 - Research and demonstration projects conducted by or subject to the approval of department or agency heads, and which are designed to study, evaluate, or otherwise examine public programs or benefits.

☐ Exemption 6 - Taste and food quality evaluation and consumer acceptance studies.

Annual continuation applications are not required for exempt projects. If you make changes to the study's design or procedures that increase the risk to subjects or include activities that do not fall within the approved exemption category, please contact me to discuss whether or not a new application must be submitted. Any such changes or modifications must be reviewed and approved by the IRB prior to implementation.

Please retain this letter for your files. If the research is being conducted for a master's thesis or doctoral dissertation, the student must file a copy of this letter with the thesis or dissertation.

CC: Advisor - Andrea Snell
CC: Roselle Hall - IRB Chair

☐ Approved consent form/s enclosed

Office of Research Services and Sponsored Programs
Akon, OH 44302-1102
330-972-7666 • 330-972-6281 Fax
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