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Implicit Gender Measures in the Context of Gender Schema Theory

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Abstract

This study uses the Implicit Associations Test (IAT; Greenwald, McGhee & Schwartz, 1998) to examine the effectiveness of assessing gender self-concept using a two-dimensional model (in which it is possible to score high on both masculinity and femininity) versus a one-dimensional model (in which masculinity and femininity are opposite ends of a bipolar scale). The researchers expected that the two-dimensional model would predict scores on the people-things occupational preference questionnaire better than the one-dimensional model. Results did not support this hypothesis; data indicated that this may have been contributed to by limitations of the instruments. The researchers discuss these data in the context of considerations for future studies.

### Implicit Gender Measures in the Context of Gender Schema Theory

Gender schema theory helps explain the degree to which people internalize gender as a means of organizing, processing, and interpreting information about their world or their selves. In essence, a person is gender schematic to the extent that "their self-concepts and behaviors are organized on the basis of gender" (Bem, 1981; 89). Some individuals rely heavily upon a gender schema to interpret and organize information, while others rarely or never use a gender schema. Gender schemata are based on cultural constructs of femininity and masculinity. For the purposes of this study, femininity is defined as having qualities or attributes which are usually associated with females, while masculinity is defined as having qualities or attributes which are usually associated with males.

Traditionally, research on gender schemata has been conducted using explicit, self-report measures. However, recent research on implicit mental processes suggests that explicit measures can provide an incomplete description of our attitudes and beliefs. This study will review some of the strengths and limitations of explicit measures and implicit measures, and propose a way to measure implicit gender schema.

For most instruments used to measure gender schemata, individuals are typed as either feminine or masculine, depending on whether they identify with feminine or masculine traits. As stated previously, femininity and masculinity are defined by traits commonly associated with women and men, respectively. This was the case in the first psychological measure of gender schema, by which Terman and Miles (1936) used a 455 item inventory assessing femininity and masculinity according to participants' like or dislike of traditionally gender-typed items such as *nursing* and *babies* (feminine) or *soldiering* and *hunting* (masculine). It is also the case in the most recently developed measures of gender schemata, which use gender-typed traits, such as

*affectionate* and *compassionate* (feminine) or *assertive* and *confident* (masculine) (Bem, 1974; Spence, Helmreich, & Stapp, 1975; Greenwald & Farnham, 2000).

Frequent debate surrounds the extent to which different traits effectively measure gender schemata. This debate and consequent routine modification of instruments designed to measure gender schemata is inevitable; what it means to be feminine and masculine varies in different parts of the world and across time, as is evident in the canon of gender research. As cultural concepts of femininity and masculinity evolve, instruments designed to measure gender schemata must also evolve, in order to maintain their validity.

Gender researchers and theorists have long engaged in heated debate over psychological differences between women and men. A divergence is present in this research; some of it seems to exaggerate differences between women and men, while some of it seems to deny these differences altogether. Richard Lippa (2006) suggests the likely reality of the debate: women and men exhibit a wide range of often inconsistent similarities and differences which are resultant from complex interactions of social and biological factors. Thus, a strict argument either for or against psychological differences between women and men will inevitably arrive at mixed evidence. Regardless of one's perspective on gender, enough research exists that it would be impossible not to acknowledge some of these reported differences. In a review article, Lippa (2006) lists some of the most pronounced differences between women and men, including incidence and prevalence of many behavior problems, several childhood behaviors, sexual orientation, sex drive, social dominance orientation, and tendency of task-oriented or social-emotional behaviors. Occupational preference has proved to be one of the most pronounced differences between women and men. When testing participants' preferences for a list of 131 occupations that were categorized as people-oriented or thing-oriented, Lippa (1998)

found that "the relationship between gender and the people–things dimension was highly significant  $\chi^2(1, N = 289) = 67.65, p < .0001$ ". Therefore, women tend to show a preference toward people-oriented occupations (such as teacher, social worker, or minister), whereas men tend to show a preference toward thing-oriented occupations (such as mechanic, carpenter, or farmer). Because this correlation shows a large effect size and high level of significance, a measure of occupational preference would be an ideal point reference by which to gauge participants' tendencies toward feminine and masculine gender schemata.

These examples of gender differences raise the question: how do gender schemata cause such disparity between these aspects of women and men? In order to better understand exactly what these differences indicate, it is helpful to further discuss some of the current instruments used by gender researchers. Measuring a person's gender schema is done in two ways: explicitly and implicitly.

#### *Explicit Measures of Gender*

Explicit measures are surveys or questionnaires; they rely on participants' conscious, cognizant attitudes and beliefs about a particular topic. This type of measure detects attitudes that are "controllable, intended, made with awareness, and [require] cognitive resources" (Nosek, 2007). Due to the use of self-reporting in explicit measures, they are at risk of detecting inaccurate responses. A problem occurs in instances when a survey's contents are of a controversial nature; participants may become concerned with the way other people perceive them. Participants could potentially alter their responses as a result of a heightened awareness of their beliefs. This limitation illustrates the nature of the explicit measure. In addition to the problem of bias in reporting, explicit measures detect only those beliefs and attitudes of which

people are aware. In other words, explicit measures detect attitudes to the degree which a person is aware of his or her own attitudes and beliefs.

For measuring gender schema, Sandra Bem developed an explicit measure known as the Bem Sex Role Inventory (BSRI), which examines the degree to which participants identify with gender-typed traits (1974). The BSRI is comprised of a list of 60 adjectives, which fall into three categories: feminine traits, masculine traits, and neutral traits. The neutral traits are included so participants are less likely to be able to distinguish between the feminine and masculine traits. The traits are rated using a Likert scale from 1 (never or almost never true of me) to 7 (almost always true of me). Once the participants complete these ratings, they are given a score for femininity, a score for masculinity, and a score for the neutral traits, and a median split is used to divide the sample into four groups. If a participant falls above or below the median, she or he is sex-typed (feminine or masculine). If a participant scores above the median for both feminine and masculine traits, she or he is androgynous (her or his ratings are high in both feminine and masculine traits). If a participant scores below the median for both feminine and masculine traits, she or he is considered undifferentiated (her or his ratings are low in both feminine and masculine traits; Frable & Bem, 1985). The BSRI has been used and is currently being used to examine how gender schema has an effect on a wide variety of topics, such as sensation seeking (Onggen, 2007), creative styles (Keller, Lavish, & Brown, 2007), and number of sexual partners (Fink, Brewer, Fehl, & Neave, 2007).

The format of the BSRI explicates some fundamental assumptions of gender schema theory. When considering gender schemata, there is often a bias to conceptualize femininity and masculinity as opposite ends of a bipolar continuum. In the model proposed by gender schema theory, however, femininity and masculinity are independent of each other, represented by two

unipolar scales. Thus, an individual can be high in femininity and low in masculinity, high in masculinity and low in femininity, high in both femininity and masculinity, or low in both.

Research has shown that individuals who are gender schematic (either feminine or masculine) do fit a bipolar model (that is, if an individual is high in femininity, she or he is likely to be low in masculinity, and vice versa). However, for individuals who are gender aschematic (androgynous or undifferentiated), the bipolar model fails to provide an accurate description of gender schema. A bipolar conceptualization of gender schemata would therefore misrepresent the gender schema of any gender aschematic individuals. The magnitude of this misrepresentation is illustrated by an unexceptional sample from a study by Schmitt and Millard (1988), in which 42.7% of participants were gender aschematic ( $N = 387$ ), according to the criteria of the BSRI. In a similar study by Ricciardelli and Williams (1995), 45.7% of the sample was gender aschematic ( $N = 598$ ). As predicted by gender schema theory, in order to accurately detect all variations of gender schemata, an instrument must use a double unipolar model which allows for independent assessment of feminine and masculine traits (Schmitt & Millard, 1988; Ricciardelli & Williams, 1995; Van Strien, 1994).

### *Implicit Measures of Gender*

As opposed to an explicit measure, an implicit measure detects nonconscious, reflexive attitudes and beliefs, by assessing a participant's involuntary associations. The most commonly used implicit measure is the Implicit Associations Test (IAT). The IAT examines individuals' automatic associations between two factors. Participants are presented with two categories (one on the left and one on the right of their computer screen), into which they are asked to sort either pictures or words. For example, if the categories were good and bad, participants would sort words such as *happy, love, wonderful* and *agony, terrible, awful* into

those two categories. Next, participants are presented with a second set of categories into which they are again asked to sort either pictures or words. A second category set, for example, could be cats and dogs, into which participants would sort words such as *meow, feline, kitten* and *bark, canine, puppy*. After participants have done the previous tasks, they are asked to sort both categories at once; both category sets are paired and presented, and participants sort each word into either the left or right pair of categories, depending on which it fits. To use the above example, participants would be asked to sort *good* items and *cat* items to the left side of the screen, and *bad* and *dog* items to the right. For example, a participant would sort words such as *bark* or *agony* into the right side. Finally, the participant would then be asked to sort *good* items with *dog* items and *bad* items with *cat* items. The *good/bad* categories would remain on the same sides of the screen, but the *dog/cat* categories would be reversed. Reaction time is the most important part of the IAT, because shorter response latency indicates a tendency to draw associations between the paired categories. Longer response latency indicates fewer tendencies to associate the two things. In the above example, a faster reaction time in sorting the *good* and *cat* categories at the same time than in sorting the *good* and *dog* categories at the same time might indicate a participant's preference for cats over dogs. Inversely, a slower reaction time when sorting the *good* and *cat* categories than when sorting the *good* and *dog* categories might indicate a dislike for cats, such that the participant has a tendency to associate negative words with cats.

It could be the case that a person who claims to like dogs and cats equally would actually have an implicit preference for one or the other. So, if the IAT can detect responses of which participants are not even aware, what part of our experience is the IAT testing? Greenwald, McGhee, and Schwartz (1998) explain the concept using an analogy of the card

game Bridge. At first, one might be asked to push the left button if a spade or club is presented and the right button if a heart or diamond is presented. These should be easy to associate because of the characteristics shared by each pair of suits: their color. But when color is no longer a shared characteristic between the cards and one is asked to push the left button for clubs and diamonds and the right button for hearts and spades, it is much easier to become confused and categorize incorrectly, or with greater response latencies. However, Bridge players would be able to categorize the cards correctly with relative ease; in the game Bridge, hearts and spades are the highest ranking suits. This illustrates that the ease of implicit categorizing depends on an individual's schemata, or the mental structures she or he uses to efficiently organize and process information.

Using the IAT to determine associations between two factors has become very common among recent research, especially in identifying racial prejudice (Baron & Banaji, 2006; Hofmann et al., 2008; Rudman & Ashmore, 2007). IATs are also being used to examine in-group favoritism (Zogmaister et al., 2008), to determine the association between fatty food and arousal (Craeynest et al., 2008), and to predict drinking behavior (Houben & Wiers, 2008).

A study by Greenwald & Farnham (2000) used the IAT to measure self-concept items, such as self-esteem and gender identity. Participants were given an IAT designed to measure their implicit associations between feminine and masculine gender-typed words and their sense of self or not-self. In essence, Greenwald and Farnham used an IAT to measure participants' gender schemata; quick associations between self- and feminine-typed words, for example, would indicate that a participant identifies with the feminine gender, while quick associations between self- and masculine-typed words would indicate that a participant identifies with the masculine gender. The results of the study were verified by known-groups validation; they found that

females had stronger implicit associations with femininity and males with masculinity with a large effect size,  $d = +1.14$ .

Greenwald and Farnham's research was an important step toward a more comprehensive understanding of how psychologists understand gender schemata, but there is an inherent flaw in the design of their study. Participants were forced to categorize feminine and masculine words simultaneously into separate categories. This model, a single bipolar continuum with femininity at one end and masculinity at the other, is impoverished, according to gender schema theory and its (aforementioned) supporting research. The use of two unipolar scales would be more consistent with gender schema theory, and also more consistent with the explicit measurements which are currently being used to study gender (as previously described, questionnaires such as the BSRI use two unipolar scales for femininity and masculinity, separately). This study seeks to provide a model for using implicit measures to assess gender schemata using the double unipolar model, in concordance with the BSRI and as supported by gender schema theory. To achieve this, this study will rely on traits which represent communion and agency, which serve as a foundation for examining femininity and masculinity.

### *Communion and Agency*

Jerry Wiggins (1991) contrasts the Statue of Liberty with the Colossus of Rhodes. The inscription at the base of the Statue of Liberty begins the article, which describes Liberty as a nurturing figure, welcoming all who come to America from other countries. Next, Wiggins provides a description of Colossus, "who was honored annually by flinging four horses and a chariot into the sea for his personal use," stating that "the images of Helios driving his flaming chariot across heavens and of Liberty nurturing her wretched masses vividly symbolize two fundamental modalities of human experience" (Wiggins, 1991; 89). The two modalities of

human experience which Wiggins describes are analogous with our current conceptions of femininity and masculinity. He suggests two terms that are at the heart of the characteristics listed in measurements such as the BSRI: communion and agency. William and Best (1982) also found that across cultures females are typically associated with communion traits, whereas males are typically associated with agency traits. This research is supported upon examination of traits previously used to measure gender schemata, since traits associated with femininity typically reflect communion, while traits associated with masculinity typically reflect agency. For example, typically feminine traits such as *affectionate* and *compassionate* also represent communion traits, whereas typically masculine traits such as *assertive* and *confident* also represent agency traits. Describing gender in terms of communion and agency helps to eliminate biases associated with a polarized conception of femininity and masculinity. A woman may not want to be considered masculine, but she may still associate herself with agency traits such as *assertive* or *confident*.

For the purposes of this study, communion and agency will serve as the two unipolar scales by which gender schemata are assessed: a measure for participants' communion traits, and a measure for participants' agency traits. In accordance with gender schema theory, this is preferable to a bipolar model which forces participants to polarize femininity and masculinity; with two separate unipolar models of communion and agency, participants can potentially be high in communion, high in agency, high in both communion and agency, or low in both communion and agency. In order to translate the double unipolar model into an implicit measure, this study will use two IATs, one determining the implicit associations between a participant's self and communion and the second determining a participant's implicit associations between self and agency. In developing an implicit measure of the double unipolar model, this study does

not seek to replace explicit measures of gender, but to contribute unique information about the automatic, implicit aspect of gender schemata.

If the double unipolar model is more effective than the previously implemented bipolar model, it should be able to better predict previously tested differences between women and men, such as the aforementioned people-things dimension of occupational preference.

## METHOD

### *Participants*

After one participant's data was excluded for incompleteness, there were a total of 51 participants, ranging in age from 18 to 23. The participants were 77% female, predominantly Caucasian, and all undergraduate students at a small Midwestern liberal arts college.

### *Materials*

*Communion IAT.* A Communion IAT was used to determine participants' implicit associations between self and communal traits. For this IAT, participants were stationed at a computer and sorted a list of words into two categories by pushing the *d* key to sort to the left side of the screen, and the *k* key to sort to the right side of the screen. The IAT consisted of five sets of categories and corresponding lists of words, referred to as blocks. Communion and not-communion traits for the IAT were selected from Wiggins (1991). Some words were translated into more commonly used synonyms, to facilitate participants' speed and accuracy while sorting. Examples of communion traits included *kind*, *helpful*, and *sensitive*. Examples of not-communion traits included *unique*, *individual*, and *reserved*. Five pronouns were selected to constitute the self category (*I*, *me*, *my*, *mine*, *self*) and five pronouns were selected to constitute the not-self category (*they*, *them*, *their*, *theirs*, *other*).

*Agency IAT.* An Agency IAT was used to determine participants' implicit associations between self and agency traits. The Agency IAT was similar in format to the Communion IAT, but agency and not-agency traits replaced communion and not-communion traits. The agency and not-agency traits for the IAT were also selected from Wiggins (1991). Examples of agency traits included *independent, strong, and aggressive*. Examples of not-agency traits included *content, fulfilled, and apathetic*. The same pronouns were used for the self and not-self categories as for the Communion IAT.-

*Femininity-Masculinity IAT.* A third IAT replicated the IAT used by Greenwald and Farnham (2000). The Femininity-Masculinity IAT was similar in format to the previous IATs, but feminine traits and masculine traits were categorized simultaneously, in order to recreate an implicit bipolar model for assessing gender schema. Feminine and masculine traits were selected from the BSRI, in accordance with Greenwald and Farnham (2000). Examples of feminine traits included *sensitive, warm, and sympathetic*. Examples of masculine traits included *competitive, confident, and aggressive*. The same five self and five not-self pronouns were used for the self and not-self categories.

*Occupational Preference Questionnaire.* A survey was used as a measure of the people-things dimension of occupational preference, borrowing items from occupational preference questionnaires developed by Prediger (1982) and Lippa (1991, 1998). Examples of people-oriented occupations included teacher, social worker, and minister. Examples of thing-oriented occupations included mechanic, carpenter and computer programmer. For the complete Occupational Preference Questionnaire, see Appendix A.

*Procedure*

The study took place in a computer lab, where each participant was seated at his or her own computer. Sessions were limited to a maximum of ten participants, in order to reduce distractions. Participants signed and dated an informed consent after it was read aloud. They then completed some demographic information and the Occupational Preference Questionnaire. The three IATs were administered in counterbalanced order, to minimize any systematic effect of order across participants. When the participants were finished with all three IATs, they were debriefed.

## RESULTS

### *Scoring*

Each IAT produced 5 blocks of response times, as described above. Blocks 1, 2 and 4 were included to orient participants to each IAT and its content; only response times from blocks 3 and 5 (the critical blocks) were used in analyses. Each critical block (for example, the self/communion block of the Communion IAT) consisted of eight measures: a response time and accuracy score for each of the four categories within the block (self, not-self, communion and not-communion, for the example). The researchers eliminated any participant whose average accuracy across the four categories was less than 80%. Next, the researchers computed a weighted average response time for each category within a critical block by multiplying each response time by its respective accuracy and dividing this by the sum of the accuracies for all categories in the critical block. This allowed for responses with low accuracy to be given less weight and responses with high accuracy to be given more weight.

Once the responses had been weighted, three variables were calculated for each participant: one variable for communion, one variable for agency, and one variable for femininity. These variables were composed of the average response time differences between

trait factors from two critical trials for each of the three IATs. For example, the communion variable consisted of the difference between response times when self words were paired with high communion words and response times when self words were paired with low communion words. After computing the difference between these response times, researchers divided the difference by the pooled standard deviation of the eight response times from the two critical blocks of the IAT. This was done at the recommendation of Greenwald, Nosek, and Banaji (2003), who have found that response time difference which have been scaled for individual variability in response times.

#### *IAT Correlations*

According to this study's hypothesis, the researchers expected to find a significant correlation between participants' communion scores and preference for people-oriented occupations and a significant correlation between participants' agency scores and preference for thing-oriented occupations. These correlations would be tested against the expectedly less effective model, represented in this study by a correlation between participants' femininity scores and preferences for people-oriented occupations. The data did not support the researchers' hypothesis. What's more concerning, the data did not even trend in the direction suggested by previous studies. No significant correlation was found between participants' implicit communion scores and preference for people-oriented occupations,  $r(51) = .075, p = .658$ , nor was a significant correlation found between participants' implicit agency scores and preference for thing-oriented occupations,  $r(51) = .177, p = .218$ . Surprisingly, no significant correlation was found between participants' femininity scores and preferences for people-oriented occupations,  $r(51) = -.163, p = .259$ , though the validity of the items used in the Femininity IAT had been verified in a previous study (Greenwald & Farnham, 2000).

Contrary to this study's hypothesis, none of the IATs were able to predict occupational preference. In order to make sense of these results, the researchers further examined each component of the study. In order to examine the construct validity of the three IATs, correlations were run between femininity scores and both communion and agency scores. Construct validity would require that femininity scores be positively correlated with communion scores and negatively correlated with agency scores. However, correlations revealed no significant relationships between the variables. Both correlations were weakly positive,  $r(51) < .1$ , and non-significant,  $p > .5$

#### *Known-Groups Validity*

In accordance with known-groups validity, if the Communion IAT was effective, it should produce significantly higher communion scores for female participants than for male participants. An independent samples *t*-test was run, which found that female participants did receive higher communion scores ( $M = 46.06$ ) than male participants ( $M = -27.69$ ),  $t(47) = .36$ ,  $p = .721$  (see Figure 1). Though not significant, the trend indicates that females tend to associate self with communion traits, whereas males tend to associate self with not-communion traits.

*Figure 1.* As expected, males' average communion scores ( $M = -27.69$ ) trended negatively, while females' average communion scores ( $M = 46.06$ ) trended positively, though not significantly,  $t(47) = .36$ ,  $p = .721$ .

Similarly, it would be expected that male participants should receive higher agency scores than female participants. Another independent samples *t*-test found that males actually received significantly lower agency scores ( $M = -132.22$ ) than female participants ( $M = 15.97$ ),  $t(48) = 2.26$ ,  $p = .029$ . These results indicate a significant difference between female and male

participants, but the trend is occurring in the opposite direction than would be expected if the Agency IAT was validly measuring participants' implicit associations between self and agentic traits.

*Figure 2.* Males' average agency scores ( $M = -132.22$ ) trended significantly in the opposite direction than females' average agency scores ( $M = 15.97$ ), though an inverse trend was expected,  $t(48) = 2.26, p = .029$ .

According to previous research, female participants should receive higher femininity scores than male participants. An independent samples  $t$ -test was run, which found that females did receive higher femininity scores ( $M = -25.26$ ) than males ( $M = -123.17$ ),  $t(48) = 1.154$ , though not significantly,  $p = .254$ . Research did not predict, however, that both females and males would receive negative femininity scores. This trend, shown in Figure 3, indicates that neither females nor males tend to associate self with feminine traits.

*Figure 3.* Males and females both showed negative trends for femininity scores. Males' scores were non-significantly lower than females' scores.

#### *Occupational Preference Survey*

The items for the Occupational Preference Survey were found to be reliable (thing-oriented occupations produced a Cronbach's Alpha of .903; people-oriented occupations produced a Cronbach's Alpha of .702, after three were removed).

According to Lippa's (2006) findings, participants' preference scores for people-oriented occupations should be negatively correlated with preference scores for thing-oriented occupations. More concisely, participants who rate people-oriented occupations high for preference should rate things-oriented occupations low, and vice versa. Contrary to precedent,

however, there was a significant positive correlation between participants' preference ratings for people- and thing-oriented occupations,  $r(51) = .317, p = .025$ .

A histogram of ratings for people- and thing-oriented occupations (Figure 4) indicates that there was a floor effect, or lower limit, for things-oriented occupations. Whereas ratings for people-oriented occupations tended to follow the pattern of a normal bell curve, ratings for things-oriented occupations were concentrated at the lowest rating. This indicates that the things-oriented occupations were not as preferable to participants as the people-oriented occupations.

*Figure 4.* The distribution of ratings for people- and thing-oriented occupations ( $n = 51$ ). People-oriented occupations show a bell curve distribution, while things-oriented occupations show a floor effect.

## DISCUSSION

The results did not offer support for the hypothesis; overall there were no significant findings to suggest that a double unipolar measure would better predict previously tested gender differences than a single bipolar measure (Greenwald & Farnham, 2000).

The results did indicate, however, that the lack of evidence for the hypothesis was likely due to limitations of the study's instruments. The lack of significant correlations between the three IATs, the lack of consistency and significance across known-groups, and the floor effect for thing-oriented occupations each contribute to this explanation of the data.

### *Limitations and Future Directions*

One possible limitation of the current study is the sample. The number of males who participated in the study only made up 23% of the participants, which hindered the representativeness of the sample. Also, the sample as a whole was relatively homogenous; almost all participants were young Caucasian undergraduate students. A future study would include an

even number of female and male participants, and a more representative diversity of ethnicity and age. As previously indicated, however, the limitations of the sample were likely not the primary source of the inconsistent results of the study.

A probable limitation of the study was the nature of the IATs. The software used for the IATs only recorded an average reaction time for each critical trial. Because the reaction time for each individual item of an IAT was not recorded, the researchers were less able to follow the most up-to-date methods of IAT analysis, such as eliminating responses which were too slow or inaccurate (Greenwald, Nosek, & Banaji, 2003). A future study might employ more advanced IAT software.

Another probable limitation was the floor effect of the thing-oriented occupations in the Occupational Preference Survey. Both females and males rated thing-oriented occupations as not preferable, which precluded any correlations between occupational preference and the IATs. An explanation for this may be that many of the thing-oriented occupations in the survey were occupations that do not require higher education. The floor effect might have been a product of the study's sample; it might be the case that thing-oriented occupations are less appealing to students who are currently attending a four-year liberal arts college. A future study might use a more rigorously developed Occupational Preference Survey with occupations that are carefully controlled for valence. The issue for this study was that the list of thing-oriented occupations did not include enough occupations which were appealing to participants (or which required more education than a high school diploma or equivalent).

### *Conclusion*

Though the hypothesis was not supported, this study was successful in identifying limitations which may arise in future attempts to use a double unipolar model for measuring

implicit gender schema. This study offers a procedure which is well supported by gender schema theory, and the limitations that were found during the implementation of the procedure, which should provide a solid foundation for future studies.

## REFERENCES

- Baron, A. S., & Banaji, M. R. (2006). The development of implicit attitudes: Evidence of race evaluations from ages 6 to 10 and adulthood. *Psychological Science, 17*(1), 53-58.
- Bem, S. L. (1974). The measurement of psychological androgyny. *Journal of Consulting and Clinical Psychology, 42*(2), 155-162.
- Craeynest, M., Crombez, G., Koster, E. H. W., Haerens, L., & De Bourdeaudhuij, I. (2008). Cognitive-motivational determinants of fat food consumption in overweight and obese youngsters: The implicit association between fat food and arousal. *Journal of Behavior Therapy and Experimental Psychology, 39*(3), 354-368.
- Fink, B., Brewer, G., Fehl, K., & Neave, N. (2007). Instrumentality and lifetime number of sexual partners. *Personality and Individual Differences, 43*(4), 747-756.
- Frable, D. E., & Bem, S. L. (1985). If you are gender schematic, all members of the opposite sex look alike. *Journal of Personality and Social Psychology, 49*(2), 459-468.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the Implicit Association Test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology, 79*(6), 1022-1038.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*, 197-216.

- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74*(6), 1464-1480.
- Hofmann, W., Gschwendner, T., Castelli, L., & Schmidtt, M. (2008). Implicit and explicit attitudes and interracial interaction: The moderating role of situationally available control resources. *Group Processes & Intergroup Relations, 11*(1), 69-87.
- Houben, K., & Wiers, R. W. (2008). Implicitly positive about alcohol? Implicit positive associations predict drinking behavior. *Addictive Behaviors, 33*(8), 979-986.
- Keller, C. J., Lavish, L. A., & Brown, C. (2007). Creative styles and gender roles in undergraduate students. *Creativity Research Journal, 19*(2-3), 273-280.
- Lippa, R. (1991). Some psychometric characteristics of gender diagnosticity measures: Reliability, validity consistency across domains, and relationship to the Big Five. *Journal of Personality and Social Psychology, 61*(6), 1000-1011.
- Lippa, R. (1998). Gender-related individual differences and the structure of vocational interests: The importance of the people-things dimension. *Journal of Personality and Social Psychology, 74*(4), 996-1009.
- Lippa, R. (2006). The gender reality hypothesis. *American Psychologist, 61*(6), 639-640.
- Nosek, B. A. (2007). Understanding an individual implicitly and explicitly. *International Journal of Psychology, 42*(3), 184-188.
- Öngen, D. E. (2007). The relationships between sensation seeking and gender role orientations among Turkish university students. *Sex Roles, 57*(1-2), 111-118.

- Prediger, D. J. (1982). Dimensions underlying Holland's hexagon: Missing link between interests and occupations? *Journal of Vocational Behavior, 21*(3), 259-287.
- Ricciardelli, L. A., & Williams, R. J. (1995). Desirable and undesirable gender traits in three behavioral domains. *Sex Roles, 33*(9-10), 637-655.
- Rudman, L. A., & Ashmore, R. D. (2007). Discrimination and the Implicit Associations Test. *Group Processes & Intergroup Relations, 10*(3), 359-372.
- Schmitt, B. H., & Millard, R. T. (1988). Construct validity of the Bem Sex Role Inventory (BSRI): Does the BSRI distinguish between gender-schematic and gender aschematic individuals? *Sex Roles, 19*(9-10), 581-588.
- Spence, J. T., Helmreich, R., & Stapp, J. (1975). Ratings of self and peers on sex role attributes and their relation to self-esteem and conceptions of masculinity and femininity. *Journal of Personality and Social Psychology, 32*(1), 29-39.
- Terman, L. M., & Miles, C. C. (1936). *Sex and personality: Studies in Masculinity and Femininity*. New York: McGraw Hill.
- Van Strein, T. (1994). Gender schematic processing: An extended replication of the Larsen and Seidman study. *European Journal of Personality, 8*(1), 59-74.
- Wiggins, J. S. (1991). Agency and communion as conceptual coordinates for the understanding and measurement of interpersonal behavior. In W.M. Grove & D. Cicchetti (Eds.), *Thinking clearly about psychology. Volume 2: Personality and Psychopathology. Essays in honor of Paul E. Meehl* (pp. 89-113). Minneapolis: University of Minneapolis Press.
- Williams, J.E., & Best, D.L. (1982). *Measuring sex stereotypes: A thirty-nation study*. Beverly Hills: Sage Productions.

Zogmaister, C., Arcuri, L., Castelli, L., & Smith, E. R. (2008). The impact of loyalty and equality on implicit ingroup favoritism. *Group Processes & Intergroup Relations*, *11*(4), 493-512.

Appendix A

Occupational Preference Survey

Please rate how much you would like to work in the following occupations.

Locksmith  
Dislike 1 2 3 4 5 Like

Manager  
Dislike 1 2 3 4 5 Like

Janitor  
Dislike 1 2 3 4 5 Like

Actor/Actress  
Dislike 1 2 3 4 5 Like

Welder  
Dislike 1 2 3 4 5 Like

Counselor  
Dislike 1 2 3 4 5 Like

Minister/Priest/Rabbi  
Dislike 1 2 3 4 5 Like

Auto Mechanic  
Dislike 1 2 3 4 5 Like

Building Contractor  
Dislike 1 2 3 4 5 Like

Nurse/Doctor  
Dislike 1 2 3 4 5 Like

Waiter/Waitress  
Dislike 1 2 3 4 5 Like

Parole Officer  
Dislike 1 2 3 4 5 Like

High School Teacher  
Dislike 1 2 3 4 5 Like

Politician  
Dislike 1 2 3 4 5 Like

Electrician  
Dislike 1 2 3 4 5 Like

Construction Worker  
Dislike 1 2 3 4 5 Like

Social Worker  
Dislike 1 2 3 4 5 Like

Toolmaker  
Dislike 1 2 3 4 5 Like

Computer Programmer  
Dislike 1 2 3 4 5 Like

Blacksmith  
Dislike 1 2 3 4 5 Like

Demographics:

Age:

Sex:

Ethnicity:

