Psi Chi
Journal of
Psychological
Research

PSI CHI
THE INTERNATIONAL HONOR SOCIETY IN
PSYCHOLOGY

ABOUT PSI CHI

Psi Chi is the International Honor Society in Psychology, founded in 1929 for the purposes of encouraging, stimulating, and maintaining excellence in scholarship, and advancing the science of psychology. Membership is open to graduate and undergraduate men and women who are making the study of psychology one of their major interests and who meet the minimum qualifications. Psi Chi is a member of the Association of College Honor Societies (ACHS) and is an affiliate of the American Psychological Association (APA) and the Association for Psychological Science (APS). Psi Chi's sister honor society is Psi Beta, the national honor society in psychology for community and junior colleges.

Psi Chi functions as a federation of chapters located at over 1,100 senior colleges and universities in the U.S., Canada, and Ireland. The Psi Chi Central Office is located in Chattanooga, Tennessee. A Board of Directors, composed of psychology faculty who are Psi Chi members and who are elected by the chapters, guides the affairs of the organization and sets policy with the approval of the chapters.

Psi Chi serves two major goals—one immediate and visibly rewarding to the individual member, the other slower and more difficult to accomplish, but offering greater rewards in the long run. The first of these is the Society's obligation to provide academic recognition to its inductees by the mere fact of membership. The second goal is the obligation of each of the Society's local chapters to nurture the spark of that accomplishment by offering a climate congenial to its creative development. For example, the chapters make active attempts to nourish and stimulate professional growth through programs designed to augment and enhance the regular curriculum and to provide practical experience and fellowship through affiliation with the chapter. In addition, the organization provides programs to help achieve these goals including regional and Society conventions, research award and grant competitions, certificate recognition programs, chapter awards, and Society service projects.

JOURNAL PURPOSE STATEMENT

The twofold purpose of the *Psi Chi Journal of Psychological Research* is to foster and reward the scholarly efforts of psychology students as well as to provide them with a valuable learning experience. The articles published in this journal represent the work of undergraduates, graduate students, and faculty. Faculty mentors are identified by an asterisk next to their name or on a separate byline.

INSTRUCTIONS FOR CONTRIBUTORS

Submissions are accepted for review on an ongoing basis. Although manuscripts are limited to empirical research, they may cover any topical area in the psychological sciences.

1. A cover letter that includes:
   - identifying information for the primary author, including an e-mail address;
   - the primary author's Psi Chi membership ID number;
   - a description of the primary author's educational status (e.g., an estimated or actual date of graduation, or description of faculty appointment);
   - a statement that the manuscript is original (not published or accepted for publication elsewhere); and
   - a statement that the research was carried out with approval of an institutional review board and following proper procedures for the protection of human participants or animal subjects.
2. Sponsoring statement (undergraduate first authors only) provided by faculty mentor that specifies:
   - the research adhered to APA ethical standards;
   - the mentor has read and critiqued the manuscript on content, method, APA style, grammar, and overall presentation and mentor, affirming that it is high-level, quality work; and
   - the planning, execution, and writing of the manuscript represent primarily the work of the undergraduate student.
3. Cover page:
   - cover page in APA style (with manuscript title, authors' names, institutional affiliations, and possibly an author note).
4. A masked manuscript following these guidelines:
   - all authors' identifying information (e.g., name and school) is removed from the entire manuscript including author note, title page, and method section.
   - the manuscript is in Microsoft Word.
   - the manuscript includes figures, tables, and charts generated in either Microsoft Word or Excel (in black and white or grayscale only).
   - scanned images or illustrations (also in black and white or grayscale only) must have a resolution of at least 600 dpi resolution, and authors must be able to show that they have permission to use all images/illustrations.
   - the manuscript must adhere to APA style.

Submit all electronic files: http://www.psichi.org/pubs/journal/submissions.aspx

*Faculty mentor

The Links Between Parenting Styles and Imposter Phenomenon

Sijia Li, Jennifer L. Hughes*, and Su Myat Thu
Agnes Scott College

ABSTRACT. Clance and Imes (1978) coined the term *impostor phenomenon* to describe the phoniness an individual feels about his/her achievement and the inability to internalize success. They proposed that impostor feelings are often rooted in early family relations. Prior empirical research found partial support for this proposition. The current study investigated the links between parenting styles and the impostor phenomenon, and examined the role of the sex of adult children as a moderator variable. The sample constituted 506 American undergraduate and graduate students (105 men, 401 women). Participants were recruited using a snowball sampling technique. We found that lack of parental care, $r(444) = -.25$, $p < .001$, and parental overprotection, $r(445) = .23$, $p < .001$, were linked with higher impostor scores. Parental care, $\beta = -.18$, $t(442) = -3.30$, $p = .001$, and parental overprotection, $\beta = .18$, $t(442) = 2.38$, $p = .02$, both emerged to be predictors of impostor scores. The predictive power of parenting variables weakened when maternal and paternal parenting styles were examined separately. Only maternal care was found to be negatively predictive of impostor scores, $\beta = -.41$, $t(440) = -4.18$, $p < .001$. Men were overall less responsive to parenting variables. For men, only maternal care was found to be negatively correlated with impostor scores. For women, maternal and paternal care was found to be negatively correlated with impostor scores, and maternal and paternal overprotection was found to be positively correlated with impostor scores. Our results provided support for the proposed relationship between family environments and impostor phenomenon, and indicated that men may develop impostor feelings based on different mechanisms than women.

Not all people enjoy their accomplishments. Clance and Imes (1978) referred to those who feel phony and fraudulent about their success as *impostors*, and this experience was named the *impostor phenomenon*. Impostors think of themselves as intellectual frauds, have tremendous difficulty internalizing their achievements, experience anxiety and depression, and endure the chronic fear that they might be found out. They attribute their success to external factors (i.e., luck, effort), personal charm, and knowing the right person, rather than to their capabilities and intelligence. Clance and Imes (1978) have observed that impostors often engage in behaviors that would maintain their impostor feelings (e.g., overpreparing, using charm or perceptiveness to win others over, and not revealing what they truly think). Therefore, positive feedback or success cannot change but only confirms impostors' appraisals of themselves.

Impostor phenomenon, as a relatively new clinical construct, is closely related with other

50 *Faculty mentor

existing constructs and can have a severe mental health impact on its victims. Self-handicapping tendency and fear of failure have been consistently found to be highly correlated with and predictive of impostor feelings (Cowman & Ferrari, 2002; Fried-Buchalter, 1997; Ross, Stewart, Mugge, & Fultz, 2001; Want & Kleitman, 2006). Exhibiting these maladaptive behavior patterns, impostors in general report higher depression, higher generalized anxiety, lower self-esteem, and poorer mental health than nonimpostors (Clance & Imes, 1978; Gibson-Beverly & Schwartz, 2008; McGregor, Gee, & Posey, 2008; Ross et al., 2001; Thompson, Davis, & Davidson, 1998). Impostors may also experience difficulty in enjoying their success and achieving their full potential (Clance & O'Toole, 1987).

Impostor Phenomenon and Women

Clance and Imes (1978) first observed the impostor phenomenon in their clinical work with a group of high-achieving women. They suspected that women were prone to impostor feelings because women are not expected to succeed in our society. Thus, women lack the social support that is offered to men and may worry if a successful career will compromise their feminine characteristics (Clance, Dingman, Reviere, & Stober, 1995; Clance & O'Toole, 1987). King and Cooley (1995) and McGregor et al. (2008) confirmed that women experienced impostor feelings more frequently than men. However, other researchers reported opposite results that women and men experienced impostor feelings at a comparable rate (Bernard, Dollinger, & Ramaniah, 2002; Caselman, Self, & Self, 2006; Castro, Jones, & Mirsalimi, 2004; Cromwell, Brown, Sanchez-Huceles, & Adair, 1990; September, McCarrey, Baranowsky, Parent, & Schindler, 2001; Thompson et al., 1998). The different populations involved in these studies might be the reason for the contradictory results.

Impostor Phenomenon and the Family

Aside from the gender-specific socialization, Clance and Imes (1978) reasoned that the roots of the impostor phenomenon lie in early family relations. They predicted that atypical family role assignments, being the perfect kid or having a sibling who is unarguably considered as the smart and socially adept one, contribute to impostor feelings in adults. Clance (1986) identified four family factors related to the impostor phenomenon: (a) one learns early in life that being smart is the first command of the family, (b) one has different

interests or achievements than others in the family, (c) feedback one receives from family is inconsistent with those from the outside world, and (d) one obtains limited praise from one's parents. These family mechanisms have a negative impact on the overall psychological well-being of the children and cause them to experience impostor feelings at a higher frequency in their adulthood.

Empirical research on family environment provided partial support for the theories. Bussotti (1990) failed to establish an association between atypical family role assignments (i.e., being the smart one or socially sensitive one) and impostor feelings with a sample of undergraduate and graduate students, though psychological birth order, sex, and atypical family role assignment jointly predicted impostor scores. He suggested that the nonsignificant results might have occurred because of the wording of his questionnaire about atypical family role assignment; the direct wording of the survey (i.e., "you are the smartest child in your family") reduced the probability that an impostor would answer *yes* given his or her unfavorable self-appraisal. Another possible reason was that impostors who reported atypical family role assignments were overrepresented in the clinical population (i.e., those who sought clinical help for mental issues) and that the assertion of Clance and Imes (1978) did not hold in the general population.

Subsequent research on family mechanisms shed light on other family factors linked to the impostor phenomenon. Bussotti (1990) found that impostors are more likely to come from families that are low on cohesion, have a limited channel of expression, and have a lot of conflict and rules. Parentification (i.e., the practice that expects children to sacrifice their own needs and to carry out adult functions) and parental alcoholism have also been revealed to increase the risk of the development of impostor feelings in adult children (Castro et al., 2004; Robinson & Goodpaster, 1991). These factors all contribute to unhealthy family relations and unsupportive family environment; adults who come from families with these factors are prone to experience impostor feelings.

Parenting style, as an essential determinant of family relations, is yet another family variable that relates to the impostor phenomenon. Empirical research that has examined the relationship between parenting styles and the impostor phenomenon was very limited and produced mixed results. Sonnak and Towell (2001) found that

higher impostor scores were related to parental overprotection and lack of parental care in British university students. Nevertheless, family support failed to emerge as a significant predictor of impostor scores of adolescents in the study of Caselman et al. (2006). Want and Kleitman (2006) conducted their study with Australian adults from various occupations and ages. Their results showed that more paternal care was linked with lower impostor feelings and that more paternal and maternal overprotection was linked with higher impostor feelings. No link was found between maternal care and the impostor phenomenon. Cultural as well as generational differences might be responsible for the inconsistent results found in these studies.

Current Study

To the authors' knowledge, no research has been conducted looking at the relationships between parenting styles and the impostor phenomenon with an American population. To fill in the gap, the current study replicated Want and Kleitman's (2006) work with American young adults. We investigated how the caring and overprotective behaviors of parents are related to impostor feelings, if they predict imposter feelings, and whether the sex of adult children moderated this relationship. The hypotheses were: (a) for men and women, parental care is negatively and parental overprotection positively correlated with impostor scores; and (b) for men and women, parental care is negatively and parental overprotection is positively predictive of impostor scores.

Method

Participants

We recruited 506 undergraduate and graduate students (105 men, 401 women). The age of participants ranged from 18 to 44, with the mean age being 21.02 (SD = 3.33). Sixty-four percent of the participants reported their race as White, 17.2% as Black, 6.9% as Asian, 7.7% as biracial or multiracial, and 3.6% as other (one participant did not indicate race).

Materials

Impostor Phenomenon. The Clance Impostor Phenomenon Scale (CIPS; Clance, 1985) was used in the current study to measure the impostor feelings experienced by the participants. The scale assesses feelings of phoniness, fear of failure despite of previous success, and attributions of success to luck. It is a 20-item scale using a 5-point

Likert-type scale from 1 (*not at all true*) to 5 (*very true*). A sample item is "I can give the impression that I am more competent than I really am." Holmes, Kertay, Adamson, Holland, and Clance (1993) reported a Cronbach's alpha coefficient of .96 and found the scale to differentiate impostors from nonimpostors. French, Ullrich-French, and Follman (2008) reported an internal consistency reliability of .92 for the total scale. In the current study, the Cronbach's alpha coefficient was .91.

Parental Bonding. The Parental Bonding Instrument (PBI; Parker, Tupling, & Brown, 1979) was used in the current study to assess the perceived parent-child relationships before the age of 16. This instrument has 25 items, which are divided into two subscales including Care and Overprotection. The Care subscale measures expressed care, warmth, emotional support, and positive affect toward the children. The Overprotection subscale measures perceived control and restriction in the family. Respondents retrospectively evaluate parental behaviors and attitudes for each of their parents on a 4-point Likert-type scale from 1 (*very unlikely*) to 4 (*very likely*). The scores of Parental Care are calculated by adding scores on Maternal Care and Paternal Care subscales. Likewise, the scores of parental overprotection are obtained by adding up scores on maternal overprotection and paternal overprotection. The reliability of different subscales was found to be approximately .90 (Fouladi, Moller, & McCarthy, 2006; Mackinnon, Henderson, Scott, & Duncan-Jones, 1989). In this study, the Cronbach's alphas were .93 for scores on maternal care, .95 for scores on paternal care, .70 for maternal overprotection, and .71 for paternal overprotection.

Procedure

Eleven undergraduate research assistants used a snowball sampling technique to recruit participants. They created paper flyers and sent out e-mails to their families and friends. An individual had to be 18 or older and be enrolled in an undergraduate program or a graduate program to participate in this study. Participants were given a link to the online survey, which began with an informed consent. The survey contained questions about demographics, school, and health as well as the CIPS and the PBI among other inventories. Participation in the study was entirely voluntary though participants were entered into a drawing and had a chance to win one of four $50 Target gift cards. The authors obtained approval from the

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

52 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

Institutional Review Board prior to the recruitment.

Results

Preview: Sex Differences in Impostor Scores and Parenting Variables

In our sample, women reported significantly more impostor feelings than men, $t(504) = -3.44$, $p < .001$, $d = .42$. Men and women reported receiving comparable maternal care, $t(493) = -0.10$, $p = .92$; maternal overprotection, $t(492) = 0.29$; $p = .77$; and paternal care, $t(448) = -0.84$, $p = .40$, in their first 16 years of life. Men reported receiving less paternal overprotection than women, $t(450) = -3.75$, $p < .001$ (see Table 1 for descriptive statistics of aforementioned variables).

Correlations Between Impostor Scores and Parenting Styles

Correlations were conducted with parenting variables for women and men separately to test the first hypothesis. Our hypothesis was partially supported in that, for women, parental care was negatively related to impostor feelings, $r(355) = -.27$, $p < .001$, and parental overprotection was positively related to impostor feelings, $r(355) = .24$, $p < .001$. However, for men, neither correlations was significant, for parental care, $r(87) = -.21$, $p = .05$, or for parental overprotection, $r(88) = .12$, $p = .26$. When variables were examined separately by the gender of parents, we found that, for women, lower impostor scores were linked with more maternal care, $r(391) = -.28$, $p < .001$, and more paternal care, $r(358) = -.15$, $p = .005$. We also found that higher impostor scores were linked with more maternal overprotection, $r(390) = .23$, $p < .001$, and more paternal overprotection, $r(359)$

$= .17$, $p = .001$. For men, only maternal care was correlated with impostor feelings, $r(100) = -.24$, $p = .01$. Other parenting variables failed to correlate with impostor scores.

Correlations were also conducted for all participants in order to clarify the general relationship between these variables and to facilitate the comparison with previous research. We found that impostor scores were negatively correlated to parental care, $r(444) = -.25$, $p < .001$; maternal care, $r(493) = -.27$, $p < .001$; paternal care, $r(448) = -.14$, $p = .002$; and positively correlated to parental overprotection, $r(445) = .23$, $p < .001$; maternal overprotection, $r(492) = .21$, $p < .001$; and paternal overprotection, $r(450) = .18$, $p < .001$. Table 2 summarized the correlations between scores on the CIPS and parenting variables.

Parenting Styles as Predictors of Impostor Scores

We conducted multiple linear regressions with parental parenting variables for women and men separately to test the second hypothesis. For women, parental care was found to be negatively predictive, $\beta = -.21$, $t(353) = -3.38$, $p = .001$, and parental overprotection positively predictive of impostor scores, $\beta = .19$, $t(353) = 2.15$, $p = .03$. The model explained 8.3% of variance in impostor scores, $R^2 = .08$, $F(2, 353) = 15.91$, $p < .001$. For men, the model was not significant, $R^2 = .04$, $F(2, 353) = 1.91$, $p = .15$. Linear multiple regressions were also conducted with maternal and paternal parenting variables separately. Only maternal care emerged as a strong predictor of impostor scores for women, $\beta = -.43$, $t(351) = -3.89$, $p < .001$, although the model was significant, $R^2 = .10$, $F(4, 351) = 10.15$, $p < .001$. Maternal and paternal parenting

---

TABLE 1

Descriptive Statistics for Maternal Care, Paternal Care, Maternal Overprotection, Paternal Overprotection, and Scores on the Clance Imposter Phenomenon Scale (CIPS)

	Men		Women		t test	
Variables	M	SD	M	SD	t	p
Maternal Care	39.35	7.47	39.44	8.06	-0.10	.92
Paternal Care	36.42	8.82	37.32	9.12	-0.84	.40
Maternal Overprotection	29.00	5.53	28.82	5.75	0.29	.77
Paternal Overprotection	25.54	4.86	28.03	5.84	-3.75	<.001
Scores on the CIPS	54.57	9.58	59.75	14.61	-3.44	<.001

TABLE 2

Correlations Between Scores on the Clance Imposter Phenomenon Scale and Parenting Variables

	All participants	Men	Women
Maternal Care	-.27**	-.24*	-.28**
Paternal Care	-.14**	-.17	-.15**
Total Parental Care	-.25**	-.21	-.27**
Maternal Overprotection	.21**	.10	.23**
Paternal Overprotection	.18**	.14	.17**
Total Parental Overprotection	.23**	.12	.24**

*$p < .05$, **$p < .01$, ***$p < .001$

variables were not a strong predictor of impostor scores for men, and the model was insignificant, $R^2 = .06$, $F(4, 351) = 1.37$, $p = .25$.

For all participants, we found that parental care was negatively predictive of impostor scores, $β = -.18$, $t(442) = -3.30$, $p = .001$; and parental overprotection positively predictive, $β = .18$, $t(442) = 2.38$, $p = .02$; and that maternal care was negatively predictive of impostor scores, $β = -.41$, $t(440) = -4.18$, $p < .001$. Table 3 and 4 reported the details of regression models mentioned above.

Discussion

Clance and Imes (1978) referred to the experience of feeling fraudulent about one's accomplishment as the impostor phenomenon and speculated that early family relations contributed to the development of impostor feelings. The current study investigated the relationships between parenting styles and impostor feelings with undergraduate and graduate students in the United States and examined whether the sex of adult children moderated the relationships. We found that parental care negatively correlated to impostor scores and that parental overprotection positively correlated impostor scores. Maternal and paternal care was linked with lower impostor scores. Maternal and paternal overprotection was linked with higher impostor scores. When separating participants by sex, all aforementioned correlations were significant for women, but only the negative correlations between maternal care and impostor scores were significant for men. Overall parental care negatively

and parental overprotection positively predicted impostor scores. Both variables were strong predictors of imposter feelings in women but neither of them was in men. Maternal care was found to be negatively predictive of impostor scores when examining the impact of maternal and paternal parenting styles separately. Other parenting variables failed to predict impostor scores.

Comparison With Previous Research

The correlations found between parenting styles and impostor feelings were consistent with those found by Want and Kleitman (2006) except that the negative correlations between maternal care and impostor scores were significant in our study but not in their study. They found that lack of paternal care and paternal overprotection were predictive of higher impostor scores and reasoned that fathers have a larger impact on the development of impostor feelings in adult children. This relationship between paternal parenting styles and the impostor phenomenon was not observed in the current study.

There may be several factors that explain the difference in the findings of the two studies. The discrepancy in the mean age of the participants is likely to be one of the factors. In Want and Kleitman's (2006) study, the participants were from a wide range of occupations and had a mean age of 38.54 ($SD = 9.39$). In this study, we used a sample of undergraduate and graduate students with a mean age of 21.02 ($SD = 3.33$). The apparent age difference indicates that there might be generational gaps between participants in the two studies. The standards and expectations of parenting practices are likely to be very different from those held two generations ago. Also, Want and Kleitman (2006) conducted their study with an Australian sample. Although Australia is an individualistic country like the United States, it is not clear whether the social norms of parenting are the same in the Australian society. Fathers in Australia might be expected to take on more responsibilities and be more involved in child-rearing than fathers in the United States and thus have a more influential role in the development of impostor feelings of adult children.

This study replicated the links between parenting styles and impostor feelings found by Sonnak and Towell (2001) that lack of parental care and parental overprotection were related to higher impostor scores. Also, we found partial support for their findings that parental care and parental overprotection were strong predictors of impostor

TABLE 3
Multiple Linear Regressions With Parental Parenting Variables to Predict Scores on the Clance Imposter Phenomenon Scale

Variable	β	F	Overall R^2
All Participants			
Parental Care	-.18***		
Parental Overprotection	.18*	17.40***	.07
Men			
Parental Care	-.14		
Parental Overprotection	-.03	1.91	.04
Women			
Parental Care	-.21***		
Parental Overprotection	.19*	15.91***	.08

*$p < .05$, **$p < .01$, ***$p < .001$

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

54 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

scores because the relationship was not observed among men. The samples used in their study and in the current study both consisted of young adult students and had substantially more women than men. The similarity of the sample compositions might contribute to the similar findings. Nonetheless, our study provided further empirical evidence for the relationships between parenting styles and the impostor phenomenon, and presented a more detailed description of such relationships.

Implication on the Impostor Theory

The current study found support for the proposition of Clance and Imes (1978) that early family relations affect the development of the impostor phenomenon. Parenting styles, to a large extent, set the tone for overall family relations. Parental care creates supportive and warm family atmosphere that helps children develop a healthy sense of self-esteem and self-worth. If children are provided with sufficient parental warmth across situations, they are more likely to enjoy their success, less likely to overgeneralize their failures, less likely to feel the obligation to meet ideal or unachievable standards, and thus are less prone to experience impostor feelings. On the other hand, parental overprotection, probably leading to discouraging relations between parents and children, may impair children's self-confidence and be detrimental to their sense of self-worth. Children may interpret parental overprotection as lack of confidence in their competence and internalize this appraisal, which increases their likelihood of suffering from impostor feelings.

The links between parenting styles and the impostor phenomenon were not found to be strong among men in this study. A possible explanation is that men expect to receive less parental care and parental overprotection on average than women in their childhood according to the norm of the parenting practices. Therefore, men are overall less affected by the difference in parental care and overprotection. Nonetheless, we suspect that the mechanism of the development of the impostor phenomenon is different for men and women. Clance and Imes (1978) identified early family relations as one of the roots of impostor feelings mainly based on their clinical work with female impostors. It is possible that early family relations are more influential on women than on men, and other factors may explain the impostor phenomenon in men.

Strengths and Limitations

This study contributed to the literature on the relationships between early family environment and the impostor phenomenon by examining its impact on men and women separately. The current study was the first empirical research concerning the moderating effect of sex on how parenting styles are related to impostor feelings. It provided unique insight into the possibly different dynamics of impostor feelings in men and women. Also, the current study supported the notion that family relations have an essential role in the development of impostor feelings and demonstrated that parental parenting variables jointly predict impostor feelings in adults. Furthermore, most prior research on the same topic used non-U.S. samples. This study replicated the links found in previous research and thus increased the generalizability of previous findings.

There were several limitations to the current study. The sample in the current study was not very representative of the general population in terms of sex composition. There were substantially more women than men in the sample. Though it did

TABLE 4			
Multiple Linear Regressions With Maternal and Paternal Parenting Variables to Predict Scores on the Clance Imposter Phenomenon Scale			
Variable	β	*F*	Overall *R*²
All Participants			
Maternal Care	-.41***		
Maternal Overprotection	.15		
Paternal Care	.01		
Paternal Overprotection	.21	10.93***	.09
Men			
Maternal Care	-.28		
Maternal Overprotection	-.30		
Paternal Care	-.04		
Paternal Overprotection	.26	1.37	.06
Women			
Maternal Care	-.43***		
Maternal Overprotection	.30		
Paternal Care	-.06		
Paternal Overprotection	.06	10.15***	.10
*$p < .05$, **$p < .01$, ***$p < .001$			

not affect the results concerning women and men separately, the composition of the sample may have caused biases in results considering all participants as a whole. For example, the negative correlation between parental care and impostor scores found for all participants may be significant because of the strong relationship between the two variables for women. Thus, the nonsignificance of the relationship for men might not have enough weight to influence the results because of the small number of the men. Another limitation of this study was the low baseline number of male impostors. Using a cutoff score of 62 (Holmes et al., 1993), only 26 men were classified as impostors. This might have led to the nonsignificant results between parenting variables and impostor scores in men. In this study, the PBI was embedded among other inventories that assess other potential variables that relate to the impostor phenomenon. Nearly 10% of participants did not complete the PBI concerning paternal parenting styles, likely because of survey fatigue, which may to some extent explain the nonsignificant results regarding paternal parenting variables. In addition, the questionnaire did not ask how much each of the parents was involved in child-rearing practice. It was thus not clear whether mothers were generally more involved than fathers, which may be an alternative explanation for the results that only maternal care was strongly predictive of impostor scores.

Future Research

Future research needs to examine if the relationships between various family variables and impostor feelings among men remain nonsignificant. If so, more research should be devoted to investigating how impostor feelings develop differently in men than in women. Likewise, researchers should control for the involvement of each of the parents to clarify the influence of maternal and paternal parenting styles, and provide explanations for the difference. Still, longitudinal research may be carried out to see if and how the predictive power of parenting variables on impostor scores change with respect to time. All prior empirical research on the impostor phenomenon has been cross-sectional. Longitudinal research is especially needed to provide valuable insight into the evolution of the impostor phenomenon.

Conclusion

In the current study, we found support for the proposed connection between early family relations

and imposter feelings (Clance & Imes, 1978). We revealed that parental care linked to lower imposter scores while parental overprotection linked to higher scores. They both predicted imposter feelings in adult children. Women were found to be more responsive to parenting variables than men. The developmental mechanism of imposter feelings among men and women might be different and needs further investigation.

References

Bernard, N. S., Dollinger, S. J., & Ramaniah, N. V. (2002). Applying the big five personality factors to the impostor phenomenon. *Journal of Personality Assessment, 78*, 221–233. doi:10.1207/S15327752JPA7802_07

Bussotti, C. (1990). *The impostor phenomenon: Family roles and environment.* (Unpublished doctoral dissertation). Georgia State University, Atlanta, GA.

Caselman, T. D., Self, P. A., & Self, A. L. (2006). Adolescent attributes contributing to the imposter phenomenon. *Journal of Adolescence, 29*, 395–405. doi:10.1016/j.adolescence.2005.07.003

Castro, D. M., Jones, R. A., & Mirsalimi, H. (2004). Parentification and the impostor phenomenon: An empirical investigation. *American Journal of Family Therapy, 32*, 205–216. doi:10.1080/01926180490425676

Clance, P. R. (1985). *The impostor phenomenon: Overcoming the fear that haunts your success.* Atlanta, GA: Peachtree Publishers.

Clance, P. R. (1986). *The impostor phenomenon: When success makes you feel like a fake.* Atlanta, GA: Bantam.

Clance, P. R., Dingman, D., Reviere, S. L., & Stober, D. R. (1995). Impostor phenomenon in an interpersonal/social context: Origins and treatment. *Women & Therapy, 16*, 79–96. doi:10.1300/J015v16n04_07

Clance, P. R., & Imes, S. A. (1978). The imposter phenomenon in high achieving women: Dynamics and therapeutic intervention. *Psychotherapy: Theory, Research & Practice, 15*, 241–247. doi:10.1037/h0086006

Clance, P. R., & O'Toole, M. A. (1987). The imposter phenomenon: An internal barrier to empowerment and achievement. *Women & Therapy, 6*, 51–64. doi:10.1300/J015V06N03_05

Cowman, S. E., & Ferrari, J. R. (2002). "Am I for real?" Predicting imposter tendencies from self-handicapping and affective components. *Social Behavior and Personality, 30*, 119–126. doi:10.2224/sbp.2002.30.2.119

Cromwell, B., Brown, N. W., Sanchez-Huceles, J., & Adair, F. L. (1990). The impostor phenomenon and personality characteristics of high school honor students. *Journal of Social Behavior and Personality, 5*, 563–573.

Fouladi, R. T., Moller, N. P., & McCarthy, C. J. (2006). Examination of internal consistency and construct validity of scores on the Parental Attachment Scale: Preliminary psychometric results. *Measurement and Evaluation in Counseling and Development, 39*, 2–30.

French, B. F., Ullrich-French, S. C., & Follman, D. (2008). The psychometric properties of the Clance Impostor Scale. *Personality and Individual Differences, 44*, 1270–1278. doi:10.1016/j.paid.2007.11.023

Fried-Buchalter, S. (1997). Fear of success, fear of failure, and the imposter phenomenon among male and female marketing managers. *Sex Roles, 37*, 847–859. doi:10.1007/BF02936343

Gibson-Beverly, G., & Schwartz, J. P. (2008). Attachment, entitlement, and the impostor phenomenon in female graduate students. *Journal of College Counseling, 11*, 119–132. doi:10.1002/j.2161-1882.2008.tb00029.x

Holmes, S. W., Kertay, L., Adamson, L. B., Holland, C. L., & Clance, P. R. (1993). Measuring the imposter phenomenon: A comparison of Clance's IP scale and Harvey's I-P scale. *Journal of Personality Assessment, 60*, 48–59. doi:10.1207/s15327752jpa6001_3

King, J. E., & Cooley, E. L. (1995). Achievement orientation and the impostor phenomenon among college students. *Contemporary Educational Psychology, 20*, 304–312. doi:10.1006/ceps.1995.1019

Mackinnon, A. J., Henderson, A. S., Scott, R., & Duncan-Jones, P. (1989). The Parental Bonding Instrument (PBI): An epidemiological study in a general population sample. *Psychological Medicine: A Journal of Research in Psychiatry and the Allied Sciences, 19*, 1023–1034. doi:10.1017/S0033291700005754

McGregor, L. N., Gee, D. E., & Posey, K. E. (2008). I feel like a fraud and it

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

56 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

depresses me: The relation between the imposter phenomenon and depression. *Social Behavior and Personality, 36*, 43–48. doi:10.2224/sbp.2008.36.1.43

Parker, G., Tupling, H., & Brown, L. B. (1979). A parental bonding instrument. *British Journal of Medical Psychology, 52*, 1–10. doi:10.1111/j.2044-8341.1979.tb02487.x

Robinson, S. L., & Goodpaster, S. K. (1991). The effects of parental alcoholism on perception of control and imposter phenomenon. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues, 10*(1–2), 113–119. doi:10.1007/BF02686785

Ross, S. R., Stewart, J., Mugge, M., & Fultz, B. (2001). The imposter phenomenon, achievement dispositions, and the Five Factor Model. *Personality and Individual Differences, 31*, 1347–1355. doi:10.1016/S0191-8869(00)00228-2

September, A. N., McCarrey, M., Baranowsky, A., Parent, C., & Schindler, D. (2001). The relation between well-being, imposter feelings, and gender role orientation among Canadian university students. *The Journal of Social Psychology, 141*, 218–232. doi:10.1080/00224540109600548

Sonnak, C., & Towell, T. (2001). The impostor phenomenon in British university students: Relationships between self-esteem, mental health, parental rearing style, and socioeconomic status. *Personality and Individual Differences, 31*, 863–874. doi:10.1016/S0191-8869(00)00184-7

Thompson, T., Davis, H., & Davidson, J. (1998). Attributional and affective responses of impostors to academic success and failure outcomes. *Personality and Individual Differences, 25*, 381–396. doi:10.1016/S0191-8869(98)00065-8

Want, J., & Kleitman, S. (2006). Imposter phenomenon and self-handicapping: Links with parenting styles and self-confidence. *Personality and Individual Differences, 40*, 961–971. doi:10.1016/j.paid.2005.10.005

Author Note. Sijia Li, Department of Psychology, Agnes Scott College; Jennifer L. Hughes, Department of Psychology, Agnes Scott College; Su Myat Thu, Department of Psychology, Agnes Scott College.

Sijia Li is now at Department of Psychology, University of West Florida.

Correspondences regarding this paper should be directed to Sijia Li at 11000 University Parkway, Building 41, Pensacola, FL, 32514. E-mail: sl44@students.uwf.edu.

The Effects of Prohibiting Gestures on Speech Production

Allison M. Douglas and Lori E. James[*]
University of Colorado, Colorado Springs

ABSTRACT. Evidence has indicated that gestures can impact speech production. Specifically, restricting participants' gestures can negatively impact the production of individual words and the fluency of connected speech (e.g., Frick-Horbury & Guttentag, 1998; Morsella & Krauss, 2004). We manipulated participants' ability to gesture while describing pictures with active or static content. We predicted that prohibiting gestures would decrease speech fluency, especially for pictures with active content. We measured the amount of time participants paused during speech, the rate of speech fillers, and the occurrence of obvious tip-of-the-tongue instances during the descriptions. Neither gesture condition nor picture content yielded main effects on speech fluency, but allowing gestures reduced the production of speech fillers in descriptions of pictures with static but not active content, $F(1, 21) = 6.34$, $p = .02$, $\eta^2_p = .23$, contrary to prediction. Findings have suggested that being able to gesture may slightly impact fluency even if gestures are not actually produced while speaking.

There are times in which our speech production processes falter, and the valuable mechanisms we generally take for granted temporarily fail to function. The mechanisms underlying speech production, particularly word retrieval, have not been clearly established. The fluency of speech can be influenced by many factors, including nonverbal variables such as the one of primary interest in the current study: the ability to produce gestures while speaking (e.g., Frick-Horbury & Guttentag, 1998; Morsella & Krauss, 2004). The study of how gestures impact language production is of potential importance to theory development because existing theories of language production (e.g., MacKay, 1987) would need to explain any obtained effect of gesturing. Additionally, if gesturing is determined to be an effective way to improve speech fluency, gesturing could be incorporated into certain types of speech therapy.

Although speech generally flows quite fluently, a number of speech disfluency types exist. Fluency measures can include counts of stutters, incomplete words, and repeated words or phrases, as well as assessments of pause length or pause frequency, and the production of filler words (e.g., *um*, *uh*, *er*) while searching for a particular word or planning utterances (e.g., Burke & Shafto, 2008; Kasl & Mahl, 1965; Mahl, 1987), but as noted by Kemper, Herman, and Lian (2003), fluency measures have varied dramatically across studies. Most people have experienced the frustrating sensation in which they know a word they are looking for, but temporarily cannot access it. These retrieval problems are called tip-of-the-tongue (TOT) states, and they are experienced by people of all ages (Burke, MacKay, Worthley, & Wade, 1991; Maylor, 1990). TOTs occur when the phonological components of a word are not accessible even though the semantic information about the word has been retrieved (James & Burke, 2000). TOTs therefore represent a failure of lexical access that disrupts speech fluency. However, they are not the only type of speech disfluency, and there are numerous ways in which speech

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

58 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

*Faculty mentor

can be disrupted, with a variety of underlying causes. For example, Mahl (1987) described several types of speech disfluency that vary with the speaker's anxiety level, and Kemper et al. (2003) described ways in which normal aging affects the fluency of speech.

One specific branch of research on factors contributing to the fluency of speech production has tested the effect of body (particularly hand) movement on tasks involving the retrieval of specific target words. Frick-Horbury and Guttentag (1998) found that more words were correctly produced by participants whose hand movements were unrestrained than by participants in a restrained group. Interestingly, this benefit of being able to gesture occurred even though correct answers were generally produced *without* accompanying gestures. In other words, having the ability to gesture made word retrieval easier, although actually gesturing did not appear to impact task performance. Ravizza (2003) found that finger tapping movements with no obvious meaning improved lexical production compared to remaining still. This effect was limited to resolution of TOT states (i.e., coming up with the correct word once in a TOT state), as movement did not help generate correct responses when the speaker was not in a TOT state (see also Beattie & Coughlan, 1999).

In addition to affecting TOT states, prohibiting gestures can impact speech fluency during utterances longer than a single word. Graham and Heywood (1975) tested speech fluidity when participants were either free to move or told to fold their arms while describing line drawings. Movement restriction did increase the difficulty of speech production as indicated by one of several measures of pause time, but did not affect other measures of pause time, production of hesitations (e.g., *uhs*), or speech rate. Hostetter and Skirving (2011) found that participants gestured more when describing an event after watching a cartoon that included verbal narration than when only hearing the narration (with no visual component). However, they found no difference in the number of speech disfluencies produced in the two conditions, suggesting that the increased gesturing in the visual condition resulted from accessing mental imagery rather than from problems with lexical access. Nevertheless, visuospatial content descriptions did prompt more gestures than verbal content ones. Morsella and Krauss (2004) examined the use of gestures during descriptions of objects, and found that descriptions of objects removed from view were accompanied by more gestures than descriptions of objects that remained visible. There was a noticeable use of gestures even in descriptions of stimuli that were present during the task, suggesting that gestures may serve as a method of aiding lexical retrieval, in apparent contradiction to the results of Hostettler and Skirving (2011). Morsella and Krauss (2004) also found that speech rate decreased when instructions prohibited gesturing, regardless of whether or not the stimulus was present, reflecting participants' reduced speech fluidity when restrained from gesturing.

A critical concern about these previous studies of gesture and discourse, in addition to the TOT research described previously, is that participants in the nongesturing group might have been distracted by having to focus on not moving or making gestures, leading to the obtained performance decrements. An experiment by Rauscher, Krauss, and Chen (1996) strongly influenced the design of the current study because they planned their study to avoid the confounding variable of distraction. Rauscher et al. (1996) showed cartoon video clips and compared participants' speech fluency while describing the videos under conditions that allowed or prohibited gestures. In order to prevent participants from discovering that the focus of the research was gesturing, the researchers attached electrodes to either participants' ankles (the gestures-allowed condition) or palms (the gestures-prohibited condition) and told participants they were collecting physiological measures through the electrodes. In reality, the electrodes were attached to prevent participant movement. Participants were told to keep their limbs in contact with the electrodes (i.e., to not move). They calculated the number of filled pauses, silent pauses, truncated sentences, word fragments, and repeated words in the video descriptions and found that being allowed to gesture specifically benefited speech fluency when participants were describing spatial content. In other words, when participants were describing the location of an item (e.g., when using prepositional phrases beginning with in or on), they produced fewer pauses and other disfluencies in the gestures-allowed condition than the gestures-prohibited condition. When participants were describing nonspatial content, there was no benefit of being able to gesture.

The Current Study

In this initial, pilot study of the effect of gesturing

on oral picture descriptions, we tested whether the ability to gesture facilitates lexical retrieval and affects the overall fluency of speech production. Critically, we eliminated the confounding variable of distraction or divided attention found in many past experiments (i.e., in which participants in the restrained condition were specifically told to remain still) by using methodology similar to Rauscher et al. (1996). We placed electrodes either on participants' palms or ankles, and all participants were told we were measuring their skin conductance to assess their anxiety. In reality, the electrodes served to ensure that half the participants (those with electrodes on their palms) would not gesture whereas the other half (those with electrodes on their ankles) were free to gesture. This allowed us to avoid disclosing our interest in gestures and to avoid telling participants in one group to remain still and not gesture. This ensured that both groups had a similar experience except for the placement of the electrodes, thereby allowing a more accurate assessment of the effect of gesturing on speech production than provided by many previous studies.

Because Rauscher et al. (1996) and Hostetter and Skirving (2011) found differences in the effect of allowing gestures when describing spatial versus nonspatial content, we manipulated picture content to test whether active and static content yield similar gesture use and produce similar benefits of gestures on speech fluency. By using pictures as stimuli to elicit descriptions, we expected frequent use of gestures for those given the freedom to do so. Speech fluency was assessed through three different measures: speech fillers (e.g., *uh*, *um*), the percent of time during which the speaker paused while producing each description, and identifiable TOT states. We predicted that being allowed to gesture would benefit speech fluency overall, with a pronounced benefit for descriptions of pictures with active compared to static content. In other words, we expected fewer speech fillers, less time spent pausing during speech, and fewer identifiable TOTs in the gestures-allowed than in the gestures-prohibited condition, and we expected the benefit of being allowed to gesture would be greater for descriptions of pictures with active content than for descriptions of pictures with static content.

Method

Participants

Participants were 23 undergraduate students ranging in age from 18 to 46 years (M = 25.65,

SD = 8.79). Participants completed between 12 and 16 years of education (M = 14.39; SD = 1.31). There were 17 women and 6 men. Eighteen participants identified themselves as White, two as Hispanic, one as Black, one as Asian or Pacific Islander, and one as American Indian or Alaskan Native. All were fluent speakers of English with a mean of 29.75 items correct out of 40 (SD = 5.00) on the Shipley Vocabulary Test (Shipley, 1940). One participant identified herself as bilingual. An additional two participants were tested but their data were not analyzed (one was not fluent in English and another misunderstood task instructions). All participants were compensated with credit to be used in their choice of psychology course.

Materials

Stimuli consisted of six pairs of pictures matched on the type of visual content, with one member of each pair having active content and one having static content. For example, one picture included players on a lacrosse field in the middle of a game, and its paired picture included a person posing for a lacrosse team picture without any action involved. Another picture included a wrecked car sitting in a parking lot, and its paired picture included a car in midair during a crash on a racetrack. Pictures were presented one at a time via a PowerPoint slideshow, with five randomly ordered versions created to minimize order effects.

Participants sat in a chair, and nonfunctional electrodes were attached to either their palms or ankles. The electrodes were connected to a nonfunctional machine, ostensibly for measuring skin conductance. A Sony Handycam® (model DCR-DVD308) video recorder and an Optimus™ (model CTR-111) audio recorder were used to record participant gestures and speech.

We administered an informed consent form, and a demographics questionnaire on which we asked for each participant's age, sex, years of education completed, race or ethnicity, and native language(s). We also gave the 40-item, multiple-choice Shipley (1940) vocabulary test.

Procedure

Our project was approved by our university's institutional review board. Participants read and signed the consent form and then completed a demographics form and the vocabulary test. Participants received instructions that skin conductance measurements would be taken through either their palms or ankles.

Participants were assigned to conditions in alternating order of arrival for participation, resulting in 12 participants in the gestures-prohibited condition and 11 in the gestures-allowed condition. Participants in each condition were treated identically except for the placement of the electrodes. In reality, the skin conductance machine was not functional, but this deception allowed participants to be placed in either the gestures-allowed (electrodes on ankles) or gestures-prohibited (electrodes on palms) condition without the confounding variable of distraction (i.e., both groups were potentially distracted by having electrodes attached to them). The experiment thus avoided demand characteristics that could come with participants knowing that gesturing was a component of the experiment. To be sure that gesturing was actually prevented, the limbs with the attached electrodes were also loosely tethered to the chair by easily removed restraints. Participants were told not to move their hands (in the gestures-prohibited condition) or their feet (in the gestures-allowed condition). They were led to believe that we did not want them to move in order to ensure that they did not accidentally dislodge the electrodes and prevent data collection.

Each participant described all 12 pictures. In other words, picture content (active versus static) was manipulated within participants and was not presented in blocked fashion. Participants were instructed to look at each of the 12 pictures on the laptop screen and describe only the physical content of the pictures (not their emotional responses to them) in as much detail as possible. They were told to aim for at least 1 min of speech to thoroughly describe the scene as if talking to someone who could not see the picture. Participants were to indicate to the experimenter when they were ready to proceed to the next slide. Participants were videotaped and audio-recorded for later coding of their gestures and speech. When participants had completed their descriptions, they were debriefed and told the real purpose of the electrodes. Participants were compensated with course credit following completion of the study.

To analyze participants' speech production, one experimenter listened to and transcribed each audio recording, and then a second experimenter listened to the same audio recording and double-checked and edited the original transcripts. Then the first experimenter went back and approved or rejected any changes made by the second experimenter. The first experimenter then counted the number of words and the number of speech fillers, and these were also double-checked by the second experimenter. The first experimenter assessed gestures from each video recording, using a broad definition of gesturing (i.e., any motion of the hands and/or arms during the speech task), and the identified gestures were confirmed by a second experimenter. We divided the number of speech fillers by the number of words spoken for each description to get a percentage of fillers in each condition. We computed the percent of time speakers paused during each picture description by dividing total amount of pause time by total speaking time in each condition. Finally, we tallied instances of identifiable TOTs and the number of gestures produced in each condition.

Results

We conducted 2 x 2 mixed factorial analyses of variance (ANOVAs) with gesture condition as a between-participant variable, and picture content as a repeated measure. Table 1 (top) displays the means and standard deviations for speech fillers in each condition. There were no main effects of gesture condition, $F(1, 21) = 0.98$, $p = .33$, $\eta^2_p = .05$, or of picture content, $F(1, 21) = 0.28$, $p = .61$, $\eta^2_p = .01$, on the frequency of speech fillers. However, gesture condition interacted with picture content, $F(1, 21) = 6.34$, $p = .02$, $\eta^2_p = .23$. Participants in the gestures-allowed condition produced a similar percentage of speech fillers for active and static pictures, $t(10) = 1.23$, $p = .25$. However, participants in the gestures-prohibited condition produced more speech fillers when describing static than active pictures, $t(11) = 2.51$, $p = .03$.

Table 1 (bottom) displays the means and standard deviations for percent of time spent pausing

TABLE 1
Speech Fillers (as % of Words Produced) and Pause Time (as % of Time Spent Speaking) for Active and Static Picture Content in the Gestures-Allowed and Gestures-Prohibited Conditions

	Gestures Allowed		Gestures Prohibited	
	M	*SD*	*M*	*SD*
Speech Fillers				
Active Content	4.4%	2.5%	4.7%	1.9%
Static Content	3.9%	2.3%	5.6%	2.8%
Percent of Time with Pauses				
Active Content	29.9%	13.6%	31.4%	10.2%
Static Content	31.6%	14.6%	32.3%	10.4%

in each condition. There was no main effect of gesture condition, $F(1, 21) = 0.05$, $p = .83$, $\eta^2_p < .01$, or picture content, $F(1, 21) = 2.55$, $p = .13$, $\eta^2_p = .11$, and no interaction between gesture condition and picture content, $F(1, 21) = 0.21$, $p = .65$, $\eta^2_p = .01$.

Of 23 participants in the study, only two people appeared to experience one TOT state each, as indicated by expressions of frustration and excited resolution statements indicating that they knew the word but had temporary difficulty retrieving it. One example is the statement, "… maybe a... haha what's it called? Um... it was black. An El Camino! That's what it looks like, an El Camino." The participant came up with the right name for the car, but it took the speaker effort to retrieve the word. Both of the observed TOT states occurred in the gestures-prohibited condition.

In addition to finding few clear examples of TOTs, we also found that very few gestures were produced during the description task. Of 11 participants in the gestures-allowed condition, only two made any gestures. One participant performed one distinct gesture (while describing a cheerleader doing the splits in the air, the speaker put her hands together with fingers pointed out in opposite directions to create a 'v' to demonstrate how the cheerleaders' legs were positioned in the splits), and the other produced one distinct gesture and one questionable hand motion that could be interpreted as a gesture. Thus, even when participants experienced no restriction in ability to move their hands, few took the opportunity to gesture.

Discussion

We used three different measures of speech fluency in this pilot study on the impact of gestures during a picture description task. On the whole, being allowed to gesture did not dramatically benefit speech fluency. Gesture condition interacted with type of picture content being described for our measure of speech fillers, but not for the amount of time spent pausing. There were also too few clear instances of TOT states to make meaningful conclusions regarding this measure, although the finding that both clear TOTs occurred for participants in the gestures-prohibited condition suggests that limiting gestures could increase TOT states.

The finding that the ability to gesture only reduced speech fillers in the static condition was contrary to our prediction. When participants described pictures, such as an airborne car crashing or people diving for the ball in lacrosse, the freedom to gesture did not lead to the production of more fluent speech. However, when describing a picture of a stationary car, or a girl in a lacrosse uniform standing still, the ability to gesture did lead to the production of more fluent speech. One possible explanation for this unexpected finding is that many of our pictures with static content had fewer detailed components for participants to describe than our pictures with active content. For example, in one static picture there was a solitary man in a karate uniform standing against a dark background, and the paired active picture contained two men engaged in martial arts competition with a house and other details visible in the background. Although both pictures did contain many details, most of our participants described the pictures without including every possible specific detail. This unintentional difference in visual complexity between picture types might have left people to utter *um* and *uh* while searching for something more to say about the static pictures, but only in the condition in which gestures were prohibited. Finding a main effect of picture content on speech filler production would indicate a greater number of speech fillers produced for active versus static pictures. If this were the case, differences in visual complexity between the two conditions could have affected the outcome. However, we did not obtain a main effect of picture content on speech filler production, so the possible confounding of visual complexity with picture content is not a substantial concern. Further, it does not reduce the importance of the obtained interaction between gesture condition and picture content: The reduced speech fillers in the static condition for participants who were allowed to gesture indicates that they had less difficulty finding something to describe about the pictures than participants who were not allowed to gesture, an interesting finding consistent with the idea that gestures can facilitate language production. Nevertheless, future research should aim to control the number of visual elements contained within pictures in the two conditions.

Our lack of a main effect of gesture condition on the production of filler terms or proportion of speech time spent pausing is in accordance with some (e.g., Beattie & Coughlan, 1999; Hostetter & Skirving, 2011; Ravizza, 2003) but not all past research (e.g., Frick-Horbury & Guttentag, 1998; Pine, Bird, & Kirk, 2007). Our study eliminated the potential distraction of participants in one condition being told to remain still, suggesting that previous findings might have been due to the divided attention necessary to perform the task

in that condition. Our finding that being allowed to gesture benefited participant descriptions more in the static than active content condition is interesting because this variable has not been used in past research. Future research could employ video clips with varying degrees of activity in their content, which provides the benefit of actual moving action rather than a still picture of inferred motion. Future research should continue to look at the influence of gestures on pauses as a measure of speech disfluency because we found no effects on this measure. These results were contrary to the findings of Graham and Heywood (1975) who found an increase in proportion of time spent pausing when participants were restricted from gesturing.

The limited number of gestures produced by participants in the gestures-allowed condition could be attributed to the fact that our picture description task did not require the use of significant mental imagery. Sassenberg and van der Meer (2010) suggested that gestures are used more often used with activation of images in the mind (see also Wesp, Hesse, Keutmann, & Wheaton, 2001). The task of the current study only required participants to describe a visible picture; therefore, little mental imagery was needed to complete the task. Had participants been asked to describe a scene from their own imagination, rather than a scene presented to them, perhaps more gestures would have occurred. Mol, Krahmer, Maes, and Swerts (2009) found that participants used fewer gestures when giving descriptions to a machine than to a person, suggesting that the lack of gestures in the current study could have occurred because participants did not have an audience to whom they were communicating. Participants in our study were not told to describe the picture to the experimenter, and they generally directed their descriptions directly to the video camera. In future research, having an experimenter or confederate serve as the recipient of the information being conveyed by the speaker could increase the production of gestures during the picture description task.

Previous research on the impact of gestures on speech has yielded various results (e.g., Beattie & Coughlan, 1999; Frick-Horbury & Guttentag, 1998; Hostetter & Skirving, 2011; Pine et al., 2007; Ravizza, 2003). The present findings contributed to the literature on this relationship and suggested the need for much more research in this area, with the ultimate goal of developing a sound theoretical model of how gesturing exerts an influence on speech fluency.

References

Beattie, G., & Coughlan, J. (1999). An experimental investigation of the role of iconic gestures in lexical access using the tip-of-the tongue phenomenon. *British Journal of Psychology, 90*, 35–56. doi:10.1348/000712699161251

Burke, D. M., MacKay, D. G., Worthley, J. S, & Wade, E. (1991). On the tip of the tongue: What causes word finding failures in young and older adults?. *Journal of Memory and Language, 30*, 542–579. doi:10.1016/0749-596X(91)90026-G

Burke, D. M., & Shafto, M. A. (2008). Language and aging. In F. I. M. Craik & T. A. Salthouse (Eds.), *The handbook of aging and cognition* (pp. 373–443). New York, NY: Psychology Press.

Frick-Horbury, D., & Guttentag, R. E. (1998). The effects of restricting hand gesture production on lexical retrieval and free recall. *The American Journal of Psychology, 111*, 43–62. doi:10.2307/1423536

Graham, J. A., & Heywood, S. (1975). The effects of elimination of hand gestures and of verbal codability on speech performance. *European Journal of Social Psychology, 5*, 189–195. doi:10.1002/ejsp.2420050204

Hostetter, A. B., & Skirving, C. J. (2011). The effect of visual vs. verbal stimuli on gesture production. *Journal of Nonverbal Behavior, 35*, 205–223. doi:10.1007/s10919-011-0109-2

James, L. E., & Burke, D. M. (2000). Phonological priming effects on word retrieval and tip-of-the-tongue experiences in young and older adults. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 26*, 1378–1391. doi:10.1037/0278-7393.26.6.1378

Kasl, S. V., & Mahl, G. F. (1965). The relationship of disturbances and hesitations in spontaneous speech to anxiety. *Journal of Personality and Social Psychology, 1*, 425–433. doi:10.1037/h0021918

Kemper, S., Herman, R., & Lian, C. (2003). Age differences in sentence production. *Journals of Gerontology-Series B Psychological Sciences and Social Sciences, 58*, 260–268. doi:10.1093/geronb/58.5.P260

MacKay, D.G. (1987). *The organization of perception and action: A theory for language and other cognitive skills*. New York, NY: Springer-Verlag.

Mahl, G. F. (1987). Everyday disturbances of speech. In R. L. Russell (Ed.), *Language in psychotherapy: Strategies of discovery* (pp. 213–269). New York, NY US: Plenum Press.

Maylor, E. A. (1990). Recognizing and naming faces: Aging, memory retrieval, and the tip of the tongue state. *Journals of Gerontology, 45*, P215–P226. doi:10.1093/geronj/45.6.P215

Mol, L., Krahmer, E., Maes, A., & Swerts, M. (2009). The communicative import of gestures: Evidence from a comparative analysis of human-human and human-machine interactions. *Gesture, 9*, 97–126. doi:10.1075/gest.9.1.04mol

Morsella, E., & Krauss, R. M. (2004). The role of gestures in spatial working memory and speech. *The American Journal of Psychology, 117*, 411–424. doi:10.2307/4149008

Pine, K., Bird, H., & Kirk, E. (2007). The effects of prohibiting gestures on children's lexical retrieval ability. *Developmental Science, 10*, 747–754. doi:10.1111/j.1467-7687.2007.00610.x

Rauscher, F. H., Krauss, R. M., & Chen, Y. (1996). Gesture, speech, and lexical access: The role of lexical movements in speech production. *Psychological Science, 7*, 226–231. doi:10.1111/j.1467-9280.1996.tb00364.x

Ravizza, S. (2003). Movement and lexical access: Do noniconic gestures aid in retrieval?. *Psychonomic Bulletin & Review, 10*, 610–615. Retrieved from PsycINFO database.

Sassenberg, U., & van der Meer, E. (2010). Do we really gesture more when it is more difficult?. *Cognitive Science: A Multidisciplinary Journal, 34*, 643–664. doi:10.1111/j.1551-6709.2010.01101.x

Shipley, W. C. (1940). A self-administering scale for measuring intellectual impairment and deterioration. *Journal of Psychology: Interdisciplinary and Applied, 84*, 51–65. doi:10.1080/00223980.1940.9917704

Wesp, R., Hesse, J., Keutmann, D., & Wheaton, K. (2001). Gestures maintain spatial imagery. *The American Journal of Psychology, 114*, 591–600. doi:10.2307/1423612

Women's and Men's Preferences for First and Last Names

Michelle L. Ceynar and Sarah E. Stewart
Pacific Lutheran University

ABSTRACT. Although both men and women report strongly identifying with their names (Intons-Peterson & Crawford, 1985), people tend to assume that men are more attached to their surnames because most women choose to take their spouses' names at marriage. Twenty-one men and 70 women reported their explicit attitudes about their names and completed two implicit measures of name preference: an adaptation of the Implicit Association Test (IAT), and a test designed to measure the name letter effect. Results revealed no differences between the IAT latencies of men and women and that both sexes have an implicit preference for their first names. Women and men also reported a greater explicit fondness for their first names. Although both sexes reported that their first names describe them more as an individual, men were more likely to view their names as central to their identity than women. Additionally, women were more willing to consider changing their last name at marriage than men. The results were discussed in terms of modern name usage trends.

Despite cultural shifts such as women's presence in the workforce and the normalization of gender neutral language, the popular tradition of women changing their last names to that of their husbands upon marriage remains the norm in the United States (Hamilton, Geist, & Powell, 2011; Johnson & Scheuble, 1995; Scheuble, Johnson, & Johnson, 2012). About 94% of married women use their husband's surnames (Gooding & Kreider, 2010) and only an estimated 18.5% of college graduates retained their maiden names at marriage in 2001 (Goldin & Shim, 2004). Women frequently report changing their names for externally motivated reasons such as showing commitment to their marriage, and many women report never having given thought to doing anything other than taking their husbands' name (Boxer & Gritsenko, 2005). If unmarried women do anticipate changing their names at marriage, they may feel less attachment to their last names than to their first names. Their first names, therefore, may serve as their primary source of identification.

On the other hand, men, who rarely change their surnames and even pass that name to their children, may more strongly identify with their last names than do women.

Allport (1961, as cited in Twenge, 1997) contended that names shape identity because they determine the perceptions of others thereby influencing self-appraisals. Consistent with this idea, research has indicated that women who change their names are viewed as being more relationship oriented, and those who keep their maiden names or hyphenate are viewed as more agentic (Etaugh, Bridges, Cummings-Hill, & Cohen, 1999). Perceptions of women who change their surnames at marriage as more committed to family appear to be fairly stable across time and region (Etaugh et al., 1999; Scheuble et al., 2012). Researchers have found that women who chose to change their names at marriage reported seeing the name change as forming a new identity as a married person (Kline, Stafford, & Miklosovic, 1996). Likewise, women who chose to change their names

again at divorce reported the name change to be indicative of a reinvented self, detached from their former marriage (Ceynar & Gregson, 2012).

It seems apparent that people's names formulate a core part of their identities. In fact, starting from infancy, people react to the sound of their own names, even discriminating them from other names when inserted into babble (Newman, 2005). Names function as distinctive social identifiers used to differentiate individuals from each other (Nuttin, 1985, 1987). In his early research, Nuttin (1987) demonstrated that people preferred the letters belonging to their own names and that those letters are preferred over other letters in the alphabet, especially first and last name initials. Nuttin (1987) attributed this name letter effect phenomenon to *mere ownership*, arguing that an unconscious preference for the self will transfer to objects associated with the self (i.e., names). This name letter effect has been demonstrated across 12 languages, suggesting that people's preference for their own names is a culturally independent phenomenon (Nuttin, 1987). Name letter preferences have also been found for both maiden names and married names (Stieger & LeBel, 2012).

Research has demonstrated that the positive bias toward oneself (Kruger, 1999), revealed by the name letter effect, is pervasive in many domains. The need to maintain a positive view of the self may unconsciously drive personal behaviors or decisions (Greenwald & Banaji, 1995). Within the literature on implicit egoism, researchers have proposed that names have the propensity to impact people's decisions, influencing them to not only choose professions that share letters with their names, but to work for businesses whose names share letters with their own names (Pelham, Mirenberg, & Jones, 2002). Additionally, decisions to move to a location with similar first name letters are stronger for rarer names than for more ordinary names and stronger for women than for men (Pelham et al., 2002). Although there is some speculation about possible confounds related to ethnicity and reverse causation in these archival studies, laboratory studies have consistently provided valid measures of the name letter effect (Simonsohn, 2011).

One such laboratory study extended the name letter effect to the phenomenon of name letter branding (Brendl, Chattopadhyay, Pelham, & Carvallo, 2005), hypothesizing that people may favor items with brand names that possess letters corresponding to their own names. Aaker (1997) proposed that this phenomenon may occur because people regard such items as fitting their personalities or similar to themselves. In a sense, people transfer their positive perceptions of themselves to items that share attributes with themselves, specifically name letters (Anseel & Duyck, 2009). In one study testing name letter branding, pairs of passersby volunteered to taste-test two teas with invented nonnative sounding names, one of which was manipulated to contain the first three letters of the person's first name (Brendl et al., 2005). The participants preferred the tea brand with embedded letters from their own names more often than the nonname letter brand choice of tea (Brendl et al., 2005). If people's name letters are attached strongly enough to their selves to influence choices in brand names, then name letter branding may serve as a method to compare people's preferences for their first and last names.

Reports of sex differences with respect to the name letter effect are scarce. Research with Japanese participants replicated the name letter effect showing that participants preferred letters from their own names more than other letters, but also showing that men preferred the first letter of their family names and women preferred the first letter of their first names compared to their other names (Kitayama & Karasawa, 1997). Additionally, Joubert (1985) found that men rated their last names more favorably than women rated their last names. Although these findings may be attributed to women feeling less attached to their last names in anticipation of a marital name change, it might also have occurred because women prefer first names that are more unique or unusual and men prefer more common first names (Erwin, 2006). The preference a man may have for his last name may result from it being a more unique source of personal identification. The present study examined whether preferences for first or last names were found between unmarried people and whether sex differences in name preference may be due to the association with identity and sense of individuality.

In the present study, first and last names were pitted directly against each other, using both explicit and implicit measures of name preference. We expected that women would demonstrate a greater preference for their first names than their last names, whereas men would prefer their last names over their first names on two implicit measures, the Implicit Associations Task (IAT) and the name letter branding effect. In addition, we anticipated that women would express more

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

66 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

fondness for their first names than their last names and that men would do the reverse. It was hypothesized that identity and individuality would be more connected to last names for men and to first names for women. Furthermore, we predicted that women would be more willing to change their last names than men, but neither would be willing to change their first names.

Method

Participants

A sample of 91 undergraduate students (21 men and 70 women) from a private liberal arts university in the Pacific Northwest participated in the present study. Participants were unmarried and between the ages of 17 and 23 ($M = 18.63$, $SD = 1.11$). Most of the participants (79.10%) identified their race/ethnic background as White or Caucasian with 9.0% Asian and/or Pacific Islander, 2.2% Latino/a or Hispanic, and 8.7% other or multiple categories.

Materials

Participants completed a survey designed to measure their explicit attitudes toward their names. In addition to demographic information, the questionnaire contained questions pertaining to their fondness for their first and last names, attitudes about name change, and the meaning of their names. Participants rated statements regarding attitudes about names (e.g., "My first name is important to my sense of identity", "I am proud to carry my family name") on a 5-point Likert-type scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) and provided written explanations for their ratings.

The IAT, which measures implicit attitudes using a categorical pairing task, was adapted to measure participants' attitudes about their first versus last names (see Greenwald, Poehlman, Uhlmann, & Banaji, 2009 for a detailed description of the IAT). We created two overarching groups of words: *Good* (joy, love, peace, wonderful, pleasure, glorious, laughter, and happy) versus *bad* (agony, terrible, horrible, nasty, evil, awful, failure, and hurt). Participants' first and last names were manually embedded into the IAT program so that each participant had to categorize his or her own first and last name. Because the IAT is robust to variations in the number of trials and the number of exemplars per category (Greenwald et al., 2009), using eight exemplars for the *good* and *bad* categories and one exemplar for the *first* and *last* categories should not affect the validity of the measure. The categorization trials included three practice trials and four test trials, which were randomly counterbalanced within the program. The four test trials presented two of the four categories on each side of the screen and the word to be categorized in the middle of the screen. The combinations were good/first on one side of the screen with bad/last on the other side; good/last with bad/first; bad/last with good/first; and bad/first with good/last. Researchers recorded participants' reaction times (in milliseconds) in order to determine whether participants had a stronger preference toward their first or their last names.

Additionally, we employed SuperLab™, a computer program that displays stimuli and measures reaction times, to test the name letter effect (see Brendl et al., 2005). The stimuli used to measure the name letter effect were three images of abstract paintings with manipulated titles[1]. The individual paintings were selected from a single series of artwork. The paintings featured nearly identical colors and stroke techniques creating difficulty in differentiating between each painting from slide to slide, therefore controlling for the possible confound of participants actually preferring particular paintings based on distinctive characteristics. Similar to the method used by Brendl et al. (2005), the title of each painting either incorporated the first three letters of participants' first name or the first three letters of participants' last names. A neutral name of *Orsugi* was also included. The prefixes of the names were combined with the versatile suffixes of *(t)aku*, or *(m)uta*. For example, Jane Smith would see *Janaku*, *Smimuta*, and *Orsugi*, or *Januta*, *Smitaku*, and *Orsugi* depending on condition. The *t* and *m* were added when prefixes ended with vowels. Name combinations were counterbalanced to account for possible confounds associated with the suffixes themselves.

First, the program presented each of the three abstract paintings with titles manipulated as described above. Participants evaluated the paintings on a 5-point Likert-type scale ranging from 1 (*strongly dislike*) to 5 (*strongly like*). Second, the program presented pairs of paintings with the manipulated titles and participants chose one painting from each pair. Each pair was presented twice with the position of the paintings counterbalanced. We further counterbalanced for order effects by creating six different conditions that varied the presentation order of manipulated

---

[1]Digital images of the paintings were used with permission of the artist, David Kessler.

painting titles and which of the paintings was associated with each of the titles.

Procedure

Half of the participants completed the survey followed by the IAT, and half completed the IAT followed by the survey. Participants then completed the name letter effect task, which asked them to report their preferences for abstract paintings with letters from their own names embedded in the titles. At the conclusion of the task, participants received verbal and written debriefing. This research was approved by the Human Participants Review Board as being in accordance with ethical standards for the treatment of human participants.

Results

To examine the hypothesis that implicit measures would reveal that women favor their first names more than their last names and men favor their last names more than their first names, scores on the IAT were examined. Results of a t test failed to support this hypothesis, revealing that women's IAT latencies ($M = 226.41$, $SD = 182.29$) did not differ from men's IAT latencies ($M = 219.40$, $SD = 220.46$), $t(89) = 0.147$, $p = .88$, $r = .016$. A one-sample t test on the participants' IAT latency scores revealed that all participants had a significantly stronger preference for their first names over their last names, $t(90) = 11.26$, $p < .001$, $r = .76$.

We predicted that the ratings of the paintings associated with participants' first and last names would reveal that women would have a stronger preference for their first name letters and men would have a stronger preference for their last name letters. Five participants were excluded from this analysis because four had first and last names beginning with the same letter and one had a last name beginning with O, the letter of the neutral name. A 2 (participant sex) x 3 (painting name [first, last, neutral]) Analysis of Variance (ANOVA) was conducted on the ratings of the paintings. The main effect for sex was significant such that women ($M = 3.70$, $SD = 1.05$) rated the paintings more favorably than men ($M = 3.10$, $SD = .97$), $F(1, 84) = 12.35$, $p = .001$, $\eta^2 = .13$. The expected main effect for painting, $F(1, 84) = 0.049$, $p = .83$, $\eta^2 = .001$, and interaction of painting and sex, $F(1, 84) = 1.66$, $p = .20$, $\eta^2 = .019$, failed to reach significance.

To examine the hypothesis that men would express more fondness for their last names and women would express more fondness of their first names, a 2 (participant sex) x 2 (participant name [first, last]) mixed factors ANOVA was conducted on participants' ratings of fondness for their names. Results revealed a significant main effect such that all participants reported being more fond of their first names ($M = 4.23$, $SD = 0.80$) than their last names ($M = 3.79$, $SD = 1.16$), $F(1, 89) = 7.75$, $p = .007$, $\eta^2 = .08$. Additionally, the main effect of sex was marginally significant, revealing that there was a tendency for men to report more fondness for their combined names than women, $F(1, 89) = 3.80$, $p = .055$, $\eta^2 = .04$. The expected interaction of sex and name failed to reach significance, $F(1, 89) = 0.23$, $p = .63$, $\eta^2 = .003$.

To examine the hypothesis that men may derive their identity from their last names whereas women would derive their identity from their first names, a 2 (participant sex) x 2 (participant name [first, last]) mixed factors ANOVA was conducted on participants' ratings of the importance of their names to their sense of identity. Results revealed a significant main effect of sex, such that men ($M = 4.38$, $SD = 0.63$) viewed their names as more important to their sense of identity than women ($M = 3.98$, $SD = 0.71$), $F(1, 89) = 5.46$, $p = .02$, $\eta^2 = .06$. The expected interaction of sex and name failed to reach significance, $F(1, 89) = 2.32$, $p = .13$, $\eta^2 = .03$.

To examine the hypothesis that women view their first names as describing them as an individual and men view their last names as describing them as an individual, a 2 (participant sex) x 2 (participant name [first, last]) mixed factors ANOVA was conducted on participants' ratings of the importance of their names to their sense of identity. Results revealed a significant main effect such that first names ($M = 3.66$, $SD = 1.04$) were viewed as more descriptive than last names ($M = 3.19$, $SD = 1.18$), $F(1, 89) = 7.71$, $p = .007$, $\eta^2 = .08$. The expected interaction of sex and name failed to reach significance, $F(1, 89) = 0.69$, $p = .41$, $\eta^2 = .008$.

To test the hypothesis that women would be were more willing to consider changing their last names at marriage than men, a 2 (participant sex) x 2 (participant name [first, last]) mixed factors ANOVA was conducted on participants' ratings of their willingness to change their names. The results revealed significant main effects for sex and name, such that women ($M = 1.89$, $SD = 0.74$) were more willing to consider a name change than men ($M = 1.50$, $SD = 0.71$), $F(1, 89) = 4.63$, $p = .03$, $\eta^2 = .05$, and all participants were more willing to

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

68 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

consider changing their last names ($M = 2.13$, $SD = 1.31$) than their first names ($M = 1.47$, $SD = .72$), $F(1, 89) = 5.22$, $p = .025$, $\eta^2 = .06$. These main effects, however, were mediated by the expected interaction of sex and name, $F(1, 89) = 6.50$, $p = .01$, $\eta^2 = .07$. These results showed that women were more willing to consider changing their last names ($M = 2.33$, $SD = 1.36$) than their first names ($M = 1.46$, $SD = 0.70$) or than men to changing either their last names ($M = 1.48$, $SD = 0.87$) or their first names ($M = 1.52$, $SD = 0.81$).

Discussion

The results revealed that all participants preferred their first names over their last names. These findings supported the first hypothesis that women would prefer their first names over their last names but did not support the hypothesis that men would prefer their last names over their first names. However, the results did reveal that men, more than women, believed that names were important to their identities. Although not precisely how we expected the gender difference to surface, this result may reflect the reality that men tend to retain both names throughout their lives while women may anticipate relinquishing their last names and therefore be less likely to consider it an important factor in their identities. Congruently, all participants reported more fondness for their first names, but men tended to express more fondness for their full names than women in the sample. Not surprisingly, women reported more willingness to change their last names than did men.

Taken together, the results of the present study supported the idea that women choose to change their names at marriage for different reasons than simply because they are not attached to their maiden names. Research has suggested that women who take their husbands' surnames at marriage are perceived by others to be more nurturing and committed to their marriage (Etaugh, et al., 1999; Scheuble et al., 2012). Women, therefore, may choose to change their names at marriage in order to conform to societal expectations that they are nurturing and committed to their family. This interpretation would be consistent with research finding that in interviews women frequently talk about their name changes at marriage in terms of establishing a connection to their husbands (Ceynar & Bednark, 2012).

The results of the present study also aligned with what appears to be a trend of declining formality in American social relationships. One may deduce that knowing someone on a first-name basis has nearly lost its functional connotation. Where some have suggested that perhaps a woman's surname choice may disclose information about her personality (Etaugh et al., 1999), the fact that both men and women have resorted to using first names in many spheres of daily life may produce a diminished significance of marital name choice in the future.

The present study added to literature with respect to name attitudes because it analyzed attitudes about name ownership across gender and compared first versus last names using two implicit measurements that have not been previously utilized to explore this question. Additionally, we explored perceptions of men with respect to their names as part of their identities, which has not been addressed as thoroughly as women's preferences. Although the choices of the paintings in the name letter effect task did not affect participants' preferences, the method of the study may possibly be strengthened for future research by presenting the painting titles on a separate slide from the paintings to ensure that the paintings do not confound the name letter effect. The method for assessing the name letter effect should also be strengthened by using stimuli that might produce an actual preference. Because participants could not clearly distinguish between the three paintings, they may have failed to associate the names with the paintings altogether.

This research delved into implicit attitudes about names and explored possible implicit motivations for women continuing to choose to take their husbands' last names at marriage. Further research could employ the present name letter effect task to test married women's preferences for their maiden versus their married last names, expanding it to explore preferences for different last names in cases where women have been married multiple times, and incorporating a measure of the impact of how long they have been married and how many times they have been married. It may also be useful to test the effect under some sort of self-threat (see Brendl et al., 2005) because Jones, Pelham, Mirenburg, and Hetts (2002) discussed the idea that people who possess higher self-esteem are more willing to protect feelings of self-worth in the face of threat. Self-threat may add an interesting component to women's preferences for their name letters if names are indeed connected to identity.

A significant limitation of the present study was the sample. The study could be improved

by increasing the number of men and also by increasing the diversity of the sample. Because the current sample is primarily composed of White women, generalizing the findings must be done cautiously. Future research should explore name preferences among people of more varied backgrounds. Cultural naming practices are likely to impact how people view the importance of their first and last names. In cultures, for example, where women do not take their husbands' names at marriage, women may favor their full names as strongly as men.

Overall, this research provided an important methodological contribution to the literature about naming preferences. Using implicit measures of naming attitudes and directly comparing first and last names, we were able to dispel the notion that women choose to change their names at marriage because they do not have as strong ties to their surnames as do men. Those name changes, therefore, may come at a bigger personal cost to women than has been traditionally believed. Knowing this, women and men may be encouraged to consider their naming decisions carefully at the time of marriage.

References

Aaker, J. L. (1997). Dimensions of brand personality. *Journal of Marketing Research, 34*, 347–356. doi:10.2307/3151897

Anseel, F., & Duyck, W. (2009). Implicit letter preferences in job choice: An experimental test of the role of cognitive load. *The Journal of Psychology: Interdisciplinary and Applied, 143*, 207–223. doi:10.3200/JRLP.143.2.207-224

Brendl, M. C., Chattopadhyay, A., Pelham, B. W., & Carvallo, M. (2005). Name letter branding: Valence transfers when product specific needs are active. *Journal of Consumer Research, 32*, 405–415. doi:0093-5301/2005/3203.0008

Boxer, D., & Gritsenko, E. (2005). Women and surnames across cultures: Reconstituting identity in marriage. *Women and Language, 28*(2), 1–6. Retrieved from http://search.ebscohost.com.

Ceynar, M. L., & Bednark, K. S. (2012, April). *Expanding identities: Women's experiences with marital name changes.* Poster presented at Annual Western Psychological Association Convention, San Francisco, CA.

Ceynar, M. L., & Gregson, J. (2012). Narratives of keepers and changers: Women's postdivorce surname decisions. *Journal of Divorce & Remarriage, 53*, 559–580. doi:10.1080/10502556.2012.719412

Erwin, P. G. (2006). Children's evaluative stereotypes of masculine, feminine, and androgynous first names. *The Psychological Record, 56*, 513–519. Retrieved from http://search.ebscohost.com.

Etaugh, C. E., Bridges, J. S., Cummings-Hill, M., & Cohen, J. (1999). Names can never hurt me? The effects of surname use on perceptions of married women. *Psychology of Women Quarterly, 23*, 819–823. doi:10.1111/j.1471-6402.1999.tb00400.x

Goldin, C., & Shim, M. (2004). Making a name: Women's surnames at marriage and beyond. *Journal of Economic Perspectives, 18*(2), 143–160. Retrieved from http://search.ebscohost.com.

Gooding, G. E., & Kreider, R. M. (2010). Women's marital name choices in a nationally representative sample. *Journal of Family Issues, 31*, 681–701. doi:10.1177/0192513X09344688

Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review,* 102, 4–27. doi:0033-295X/95

Greenwald, A. G., Poehlman, T. A., Uhlmann, E. L., & Banaji, M. R. (2009). Understanding and using the Implicit Association Test: III. Meta-analysis of predictive validity. *Journal of Personality and Social Psychology, 97*, 17–41. doi:10.1037/a0015575

Hamilton, L., Geist, C., & Powell, B. (2011). Marital name change as a window into gender attitudes. *Gender and Society, 25*, 145–175. doi:10.1177/0891243211398653

Intons-Peterson, M. J., & Crawford, J. (1985). The meaning of marital surnames. *Sex Roles, 12*, 1163–1171. doi:10.1007/BF00287826

Johnson, D. R., & Scheuble, L. K. (1995). Women's marital naming in two generations: A national study. *Journal of Marriage and the Family, 57*, 724–732. doi:10.2307/353926

Jones, J. T., Pelham, B. W., Mirenberg, M. C., & Hetts, J. J. (2002). Name letter preferences are not merely mere exposure: Implicit egotism and self-regulation. *Journal of Experimental Social Psychology, 38*, 170–177. doi:10.1006/jesp.2001.1497

Joubert, C. E. (1985). Factors related to individuals' attitudes toward their names. *Psychological Reports, 57*, 983–986. doi:10.2466/pr0.1985.57.3.983

Kitayama, S., & Karasawa M. (1997). Implicit self-esteem in Japan: Name letters and birthday numbers. *Personality and Social Psychology Bulletin, 23*, 736–742. doi:10.1177/0146167297237006

Kline, S. L., Stafford, L., & Miklosovic, J. C. (1996). Women's surnames: Decisions, interpretations, and associations with relational qualities. *Journal of Social and Personal Relationships, 13*, 593–617. doi:10.1177/0265407596134007

Kruger, J. (1999). Lake Wobegon be gone! The "below-average effect" and the egocentric nature of comparative ability judgments. *Journal of Personality and Social Psychology, 77*, 221–232. doi:0022-3514/99

Newman, R. S. (2005). The cocktail party effect in infants revisited: Listening to one's name in noise. *Developmental Psychology, 41*, 352–362. doi:10.1037/0012-1649.41.2.352

Nuttin, J. M. (1985). Narcissism beyond Gestalt and awareness: The name letter effect. *European Journal of Social Psychology, 15*, 353–361. doi:0046-2772/85/030353-09

Nuttin, J. M. (1987). Affective consequences of mere ownership: The name letter effect in twelve European languages. *European Journal of Social Psychology, 17*, 381–402. doi:0046-2772/87/040381-22

Pelham, B. W., Mirenberg, M. C., & Jones, J. T. (2002). Why Susie sells seashells by the seashore: Implicit egotism and major life decisions. *Journal of Personality and Social Psychology, 82*, 469–487. doi:10.1037//0022-3514.82.4.469

Scheuble, L. K., Johnson, D. R., & Johnson, K. M. (2012). Marital name changing attitudes and plans of college students: Comparing change over time and across regions. *Sex Roles, 66*, 282–292. doi:10.1007/s11199-011-0089-z

Simonsohn, U. (2011). Spurious? Name similarity effects (Implicit Egoism) in marriage, job, and moving decisions. *Journal of Personality and Social Psychology, 101*, 1–24. doi:10.1037/a0021990

Stieger, S., & LeBel, E. P. (2012). Name-letter preferences for new last name and abandoned birth name initials in the context of name-change via marriage. *Social Psychology, 43*, 7–13. doi:10.1027/1864/a000075

Twenge, J. M. (1997). Mrs. his name: Women's preferences for married names. *Psychology of Women Quarterly, 21*, 417–429. doi:0361-6843/97

Author Note. Michelle L. Ceynar, Department of Psychology, Pacific Lutheran University; Sarah E. Stewart, Graduate School of Social Work, University of Denver.

Correspondence regarding this article should be addressed to Michelle L. Ceynar, Department of Psychology, Pacific Lutheran University, Tacoma, WA 98447. E-mail: ceynarml@plu.edu

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

70 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

Own-Gender Bias in Change Detection for Gender-Specific Images

Victoria L. Reis, Marianne Fallon[*], and Bradley M. Waite
Central Connecticut State University

ABSTRACT. Change blindness is a phenomenon that occurs when individuals fail to notice changes that take place in the visual world. Although individual differences in change blindness have been relatively well-studied, no one has examined differences in detection for gender[1]-relevant images. In the present study, men and women ($N = 53$) determined whether subtle changes were present in three types of images: male-oriented, female-oriented, and gender-neutral. Images were presented using a modified flicker paradigm. As expected, there were no overall differences in change detection across biological sex or image type. However, men and women more accurately detected changes for images that pertained to their gender, $F(1, 51) = 4.78$, $p = 0.03$, $\eta^2 = .09$. Men detected more changes in male-oriented images ($M = 3.30$, $SD = 0.86$) than female-oriented images ($M = 3.10$, $SD = 0.86$). Conversely, women detected more changes in female-oriented ($M = 3.50$, $SD = 0.69$) images than male-oriented images ($M = 3.20$, $SD = 0.69$). All remaining interactions were not significant, all F's < 2.24, and all p's > .14. These findings are consistent with research positing an own-gender bias and extend previous research indicating that top-down processes can partially explain change blindness.

Change blindness is defined as the "inability to report a change that has occurred between two visual stimuli" (Werner & Thies, 2000, p. 163). The changes made to stimuli can be surface-level changes in color or rotation (Cole, Kentridge, & Heywood, 2004; Hollingworth, 2003; Rensink, O'Regan, & Clark, 1997; Werner & Thies, 2000), or more dramatic alterations, such as exchanging a person who is engaged in a social interaction. In Simons and Levin (1998), pedestrians on a college campus were giving directions to a confederate when two individuals carrying a door passed between them interrupting their conversation. Unbeknownst to the pedestrian, the confederate switched with one of the individuals carrying the door. The new confederate then resumed the conversation with the pedestrian. The majority of the pedestrians (8 out of 15) failed to notice that they had spoken to two different individuals.

How can individuals miss such glaring changes in their environment? The fact that changes this extreme can be missed demonstrates the limitations of our attentional system, which has important implications for tasks that require sustained attentional focus, such as driving. It further suggests that foundational tenets on which society functions, such as the belief in the accuracy of eyewitness accounts of events, are potentially problematic themselves. When individuals encounter a visual scene, their evaluation depends, in part, upon environmental sensory information, or bottom-up processing (Gerrig & Zimbardo, 2002). By contrast, top-down processes are personal experiences, expectations,

[1]Throughout the manuscript, we used the word *gender* as opposed to the word *sex*. We recognize that this was not consistent with other *Psi Chi Journal* articles. However, this was done to provide readers with consistency of language because of the prevalent usage of the term, *own-gender bias*, which was already well-established and could not be changed.

knowledge, background, and motivations that affect one's evaluation of a visual scene (Gerrig & Zimbardo, 2002). Recent research has been aimed at understanding how these two processes explain change blindness.

Changes to certain physical features of the visual scene, or bottom-up processes, are more easily detected than others. For example, Cole et al. (2004) found that the changes made to the color of objects, as well as the addition of new objects were easily detected. By contrast, changes made to the luminance of an object were not as easily detected.

Top-down processes can also affect change detection. Participants' personal beliefs, expectations, and knowledge could direct attention to specific features of stimuli, making changes easier to detect (Rensink et al., 1997). Such influences may lead individuals to focus on parts of visual stimuli that are not altered, which could impair change detection (Caird, Edwards, Creaser, & Horrey, 2005; Hollingworth, 2003). Indeed, changes to central interest areas (i.e., parts of images that are relevant for understanding the gist of the scene), are more detectable than changes made to marginal, or less significant, areas (Rensink et al., 1997).

Experience with domain-specific imagery is another top-down factor that affects change detection. Werner and Thies (2000) tested individuals who were considered experts in a domain (American football) and compared them to individuals who were considered novices. Participants were asked to detect changes in images that depicted football and traffic scenes. Football experts detected more changes in football images than did novices. By contrast, both groups detected changes in traffic scenes comparably.

If expertise in a specific domain enhances change detection for images within that domain, we may observe a similar effect for images that are relevant to the social groups to which individuals believe they belong. Social psychologists have found that individuals tend to be biased towards others based on appearances, preferences, and similarities, even when assigned to artificial social groups that do not represent actual differences between groups (Powlishta, 1995). Powlishta (1995) demonstrated that even children display own-group biases.

Own-gender biases have been documented in facial recognition as well (Rehnman, 2007; Wright & Sladden, 2003). Wright and Sladden (2003) reported that men exhibited a recognition advantage for male faces, whereas women demonstrated superior recognition for female faces. However, Rehnman (2007) found the own-gender effect only in women. The own-bias effect has been found not only for gender, but for age, physical appearance, and race as well (Loven, Rehnman, Wiens, Lindholm, Peira, & Herlitz, 2012; Rehnman, 2007; Wright & Sladden, 2003). Loven et al. (2012) argued that superior recognition for own-race faces occurs because participants spend more time viewing own-race faces than other-race faces. Consequently, there may be an attentional bias toward images that broadly represent a social category with which an individual identifies. Such bias may impact accuracy for detecting changes in images that are relevant to particular social categories, such as gender.

Thus, in the present study we examined whether participants would exhibit an own-gender bias in change detection. To this end, men and women attempted to detect changes in both gender-specific and gender-neutral images. To disrupt bottom-up processing, a flicker paradigm was used, in which an external image intermittently masked a visual scene (Rensink et al., 1997). We predicted that men and women would not significantly differ in their overall ability to detect changes. Consistent with research on processing gender-relevant information, we predicted that there would be a significant interaction between gender and imagery, such that women, and perhaps men, would detect changes more accurately for images relevant to their gender compared to images irrelevant to their gender (Werner & Thies, 2000; Wright & Sladden, 2003).

Method

Participants

A total of 53 undergraduates (31 women, 23 men) from a comprehensive state university in the Northeast volunteered to participate in the study. Approximately half of the participants ($n = 26$) were recruited from an introductory psychology course. The remaining participants were recruited through a psychology research participant pool that consisted of students in mostly lower-division psychology courses. Forty-two participants identified as White, seven identified as Black, and four identified as Hispanic. Their ages ranged from 18 to 26 and the mean age was 20 for both men ($SD = 2.27$) and women ($SD = 2.59$). Participants were required to have perfect or corrected vision to participate. Out of the 53 participants, 25

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

72 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

reported that they wore glasses or contacts, and 21 reported that they were wearing their lenses during the time of testing. All participants provided informed consent and received course credit for their participation.

Materials

Following Werner and Thies (2000), we selected 30 images from the Internet depicting male-oriented (e.g., sports scenes, images of cars, and motorcycles), female-oriented (e.g., make-up advertisements and fashion), and gender-neutral content. Some of the male and female-oriented images included opposite-sex models. Most gender-neutral images (e.g., landscapes and traffic intersections) did not include any human figures.

We pretested the stimuli to ensure that the images were perceived as female-oriented, male-oriented, or neutral. Students in a Research Methods class viewed all 30 images projected on a large screen at the front of the classroom and determined whether an image was male-oriented, female-oriented, or neutral. Following the pretest, five images were replaced because the majority of the participants believed that the images corresponded to a different gender than the one intended.

Using Microsoft Paint® and Microsoft Word® (Version 14.0, 2010), equal numbers of male-oriented ($n = 5$), female-oriented ($n = 5$), and gender-neutral ($n = 5$) images were altered to reflect a single change. Alterations included color changes, the addition or removal of objects, and changes in the placement or rotation of objects. Further, alterations were made to parts of the images that were in the foreground, rather than the background. See Figure 1 for an example of an altered image.

Microsoft PowerPoint® (Version 14.0, 2010) was used to sequence the 30 images. For each trial, participants viewed an image for 5 s, a blank slide for 3 s (i.e., a flicker), and then an altered or identical image for 5 s. Half of the trials contained a change, whereas the other half did not. Two random orders of trials were generated. In Slideshow A the original version of altered images occurred first on change trials. In Slideshow B the altered image occurred first on change trials. No more than four trials of the same type (male-, female-, or neutral-oriented) occurred consecutively.
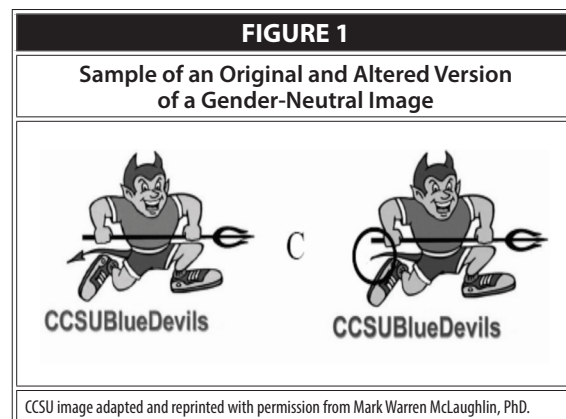
Procedure

After seeking and obtaining approval from the Institutional Review Board, testing occurred in quiet classrooms and in a small computer lab. All testing was completed by the first author. Participants were run in groups ranging in size from 2 to 15. In the classrooms, the images were presented at the front of the room on a large projection screen. Participants in the computer lab viewed the images on computer monitors. The participants were informed that they would view a series of images that may or may not contain changes. Participants then read and signed the consent form.

Before beginning the experiment, the participants completed a practice trial in which a stop sign that read "Changes Ahead" changed color from yellow to purple. Participants then decided whether a change occurred. Participants were reassured that detecting these changes can be difficult and that they should try their best.

Once the demonstration was finished, participants began the experiment. Participants were randomly assigned to one of the two slideshows. Thirty-three participants (13 men and 20 women) experienced Slideshow A. Twenty participants (9 men and 11 women) experienced Slideshow B. The number of participants varied across orders because of sampling constraints. After each trial, a screen stating "Record Your Answers" appeared for 15 s, during which participants indicated whether a change occurred on a printed response sheet. After 15 s elapsed, the next trial began.

After completing the change blindness task, written debriefing forms were distributed to participants. The participants were then informed that the purpose of this study was to examine whether men and women more accurately detected changes in images that were specific to their gender. The study took approximately 20 min to complete.

FIGURE 1

Sample of an Original and Altered Version of a Gender-Neutral Image

CCSU image adapted and reprinted with permission from Mark Warren McLaughlin, PhD.

Results

A 2 x 2 x 2 mixed model analysis of variance was conducted with change condition (changed, unchanged images) and image type (male-oriented, female-oriented) as within-participant factors and participant biological sex as the between-participant factor. The dependent variable was the total number of correct responses. The maximum number of items correct for any within-participant condition was 5. Gender-neutral images were not included in the analysis because they were used solely as filler trials. Their function was to prevent participants from predicting the purpose of the study.

The main effects of gender and image type were not significant, both F's < 0.70, all p's < .40. The mean number of correctly identified changes was 2.50 (SD = 1.45) for men and 2.60 (SD = 1.22) for women. The mean number of correctly identified changes in male-oriented images was 3.20 (SD = 0.86) and 3.30 (SD = 0.69) in female-oriented images. However, the main effect of change was significant, $F(1, 51)$ = 77.10, p < .001, η^2 = .60, such that participants were more accurate on no-change trials than on change trials. The mean number of correct responses was 4.00 (SD = 0.81) for no-change trials and 2.50 (SD = 0.95) for change trials, which is not different from chance levels of responding.

As illustrated in Figure 2, the image type x gender interaction was significant, $F(1, 51)$ = 4.78, p = .03, η^2 = .09. Greenhouse-Geisser corrected values were used to account for a violation in homogeneity of variance. Men detected more changes in male-oriented images (M = 3.30, SD = 0.86) than female-oriented images (M = 3.10, SD = 0.86). Conversely, women detected more changes in female-oriented images (M = 3.50, SD = 0.69) than male-oriented images (M = 3.20, SD = 0.69). The statistical power for this analysis was .57. All remaining interactions, including the three-way, were not significant, all F's < 2.24, and all p's > .05.

Discussion

The goal of the present study was to examine an own-gender bias in regards to change detection for gender-specific imagery. As predicted, we observed an own-gender bias such that change detection was more accurate for images relevant to their own gender. As Wright and Sladden (2003) suggested, things relevant to one's gender command attention simply because they are more interesting or meaningful. Our results are also consistent with Werner and Thies (2000), who found that individuals are more likely to detect changes in images with content pertaining to them. The findings of this study demonstrate how gender schemas and our personal biases can affect our perception and attention to objects in our environment. Further, top-down processes appear to be stronger determinants of attention than bottom-up processes.

Although we found evidence of an own-gender bias in change detection, the effect size was relatively small and our statistical power was low. Future research should attempt to replicate this finding with a larger sample size and stronger experimental control. Fully automating the procedure, including the responses, would not only better control the experimental setting, but also allow for the collection of reaction time data. In addition, making the task more difficult by using flickers of white noise (Rensink et al., 1997) rather than blank images and increasing the speed of presentation could increase differences between gender-relevant and gender-irrelevant images.

Of note, we did not expressly examine the degree to which participants identified with their gender. Rather, we grouped participants by their biological sex, which does not guarantee strong identification with a particular gender. Nevertheless, we did find evidence of an own-gender bias, which was slightly stronger for women than for

FIGURE 2

Mean Change Detection Accuracy in Change and No-Change Trials Across Image Type
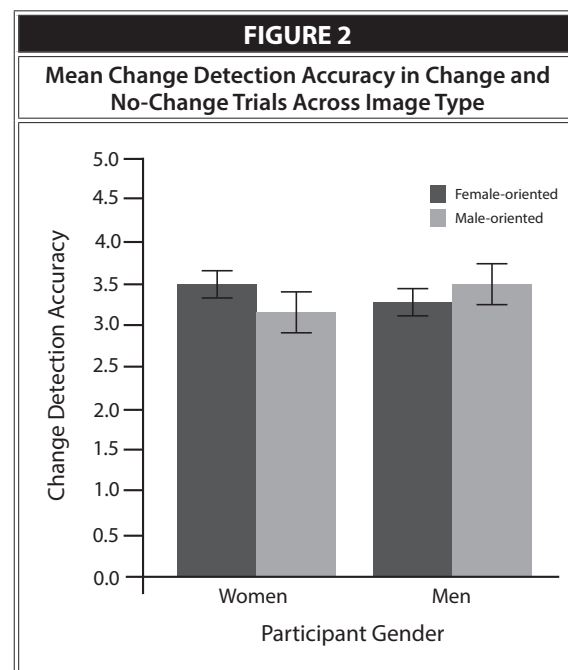
men; such that our results showed that men and women more accurately detected changes in images that pertained to their biological sex. Due to a combination of biological and social factors, women may tend to be more interested in other individuals and pay more attention to other women then to men (Rehnman, 2007).

Another limitation of this study is that the types of changes that occurred across all trial types were not perfectly counterbalanced. Upon visual inspection of the data, it appeared that changes in the rotation or spatial location of objects were easiest to detect, followed by color changes. The addition and removal of objects appeared to be the most difficult. The results from Cole et al.'s (2004) study are somewhat consistent with these findings. They found that changes in color were among the easiest to detect. However, the addition of objects was also one of the easier changes to detect, which is contrary to our observations.

Despite these limitations, the current study makes a significant contribution to our understanding of change blindness. The findings suggest preliminary support for an own-gender bias in change detection and extend previous research indicating that top-down processes can partially explain change blindness. For example, Hourihan and colleagues (Hourihan, Benjamin & Liu, 2012) found that participants were not only better at remembering own-race faces as opposed to other-race faces; they also found that participants were better at predicting their ability to recognize own-race faces as well.

Hence, identification with a particular social group, including one based on race or ethnicity, may affect our susceptibility to change blindness. Such findings have direct real-world implications related to assessing the accuracy of witness memory in legal proceedings or the accuracy of memories potentially influenced by other top-down processes. Whereas seminal research regarding change blindness involved incidental learning (e.g., Simons & Levin, 1998), the current study adds to the evidence demonstrating change blindness in intentional laboratory tasks (e.g., Werner & Theis, 2000). Unlike domain-specific expertise where knowledge and experience must be explicitly sought and developed over time (Werner & Theis, 2000), learning about one's gender seems to occur

as a normal part of everyday life from a young age (Powlishta, 1995) and may influence our ability to recall details and detect change. Thus, the findings of this present study suggest that the own-gender bias not only affects an individual's ability to recognize others, and our overall preferences towards other individuals, but it can also affect our ability to detect changes in our environment.

References

Caird, J. K., Edwards, C. J., Creaser, J. I., & Horrey, W. J. (2005). Older drive failures of attention at intersections: Using change blindness methods to assess turn decision accuracy. *Human Factors, 47*, 235–249. Retrieved from http://europepmc.org/articles/PMC3146260/reload=0;jsessionid=zo0b2TU0vQBAffloLKFe.2

Cole, G. G., Kentridge, R. W., & Heywood, C. A. (2004). Visual salience in the change detection paradigm: The special role of object onset. *Journal of Experimental Psychology: Human Perception and Performance, 30*, 464–477. doi:10.1037/0096-1523.30.3.464

Gerrig, R. J., & Zimbardo, P., G. (2002). American Psychological Association: Glossary of psychological terms. *Psychology and Life* (16th ed.). Boston, MA: Allyn & Bacon. Retrieved from http://www.apa.org/research/action/glossary.aspx

Hollingworth, A. (2003). Failures of retrieval and comparison constrain change detection in natural scenes. *Journal of Experimental Psychology: Human Perception and Performance, 29*, 388–403. doi: 1037/0096-1523.29.2.2388

Hourihan, K. L., Benjamin, A. S., & Liu, X. (2012). A cross-race effect in metamemory: Predictions of face recognition are more accurate for members of our own race. *Journal of Applied Research In Memory And Cognition, 1*, 158–162. doi:10.1016/j.jarmac.2012.06.004

Loven, J., Rehnman, J., Wiens, S., Lindholm, T., Peira, N., & Herlitz, A. (2012). Who are you looking at? The influence of face gender on visual attention and memory for own-and other-race faces. *Memory, 20*, 321–331. doi:10.1080/09658211.2012.658064

Powlishta, K. K. (1995). Gender bias in children's perceptions of personality traits. *Sex Roles, 32*, 17–28. doi:0360-0025/95/0100-0017/07.05/0

Rehnman, J. (2007). *The role of gender in face recognition.* (Doctoral thesis, Stockholm University, Sweeden). Retrieved from http://www.divaportal.org/smash/get/diva2:196786/FULLTEXT01.pdf

Rensink, R. A., O'Regan, J. K., & Clark, J. J. (1997). To see or not to see: The need for attention to perceive changes in scenes. *Psychological Science, 8*, 368–373. doi:10.1111/j.1467-9280.1997.tb00427.x

Simons, D. J., & Levin, D. T. (1998). Failure to detect changes to people during a real-world interaction. *Psychonomic Bulletin & Review, 5*, 644–649. doi:10.3758/BF03208840

Werner, S., & Thies, B. (2000). Is 'change blindness' attenuated by domain-specific expertise? An expert–novices comparison of change detection in football images. *Visual Cognition, 7*, 163–173. doi:10.1080/135062800394748

Wright, D. B., & Sladden, B. (2003). An own gender bias and the importance of hair in face recognition. *Acta Psychologica, 114*, 101–114. doi:10.1016/S0001-6918(03)00052-0

Author Note. Victoria L. Reis, Department of Psychological Science, Central Connecticut State University.

Correspondence concerning this paper should be addressed to Victoria L. Reis, c/o Dr. Marianne Fallon, Department of Psychological Science, Central Connecticut State University, 1615 Stanley Street, New Britain, CT 06050. E-mail: VLReis@outlook.com.

How Are Prosocial Responses to Ostracism Related to Thwarted Psychological Needs?

Julian Leiro and Jennifer Zwolinski*
University of San Diego

ABSTRACT. This study investigated the extent to which ostracized individuals engaged in prosocial responses after an opportunity for inclusion and the extent that these responses were related to thwarted fundamental needs. A total of 206 primarily European American female first-year college students played two games of Cyberball. In Game 1, participants were randomly assigned to the ostracism group or the inclusion group. In Game 2, all participants were assigned to the inclusion group and were told that one of the 2 other players was a repeat player from Game 1 and the other player was a newcomer. Results revealed that ostracized participants in Game 1 passed the ball to the repeat player fewer times than included participants in Game 1, U = 2859.50, Z = -5.46, r = -.38, p < .001. After Game 1, ostracized participants reported more threats to the 4 fundamental needs relative to included participants. After Game 2 inclusion, Game 1 ostracized participants reported higher needs scores than the Game 1 included group. Individuals who reported higher needs states in Game 1 and lower needs states in Game 2 showed more prosocial responses in Game 2, which suggests that the need states, not ostracism status, are related to prosocial responses to ostracism.

Social ties are an integral part of the human experience. All throughout life, people experience events in a group with others. Inevitably, however, there comes a time where an individual is left out of a group. Whether it is a child who does not get chosen to be on a team on the playground, an adult getting the cold shoulder from a group of friends, or an individual left out of an online group, exclusion from a group has important consequences on an individual's emotional well-being. It is important, then, to investigate how individuals feel after an episode of exclusion and how they respond to the excluders.

Ostracism involves being ignored or excluded, usually without any explanation or negative attention (Williams, 2007), and it can occur through a variety of contexts. Following an episode of ostracism, an individual experiences immediate psychological distress including threats to four psychological needs states, specifically belonging, control, sense of meaningful existence and self-esteem (Williams & Nida, 2011). This negative experience magnifies (a) when the ostracizer is psychologically close to the victim as opposed to being a stranger and (b) when the target believes that he or she (the target) is the one responsible for the exclusion (Nezlek, Wesselmann, Wheeler, & Williams, 2012). Furthermore, ostracized individuals may experience a loss of self-control, an increase in aggression toward others, and a harder time in self-regulation (Baumeister, DeWall, Ciarocco, & Twenge, 2005).

Not only is ostracism psychologically distressing, but the social pain of being ostracized occurs in the areas of the brain implicated in the experience of physical pain. Experiences of cyber-ostracism through Cyberball, a three-player (one participant, two confederates) online ball-throwing video game

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

76 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

where the two confederates can create an ostracism experience, have been shown to induce increased fMRI activity in the anterior cingulate cortex, which is responsible in the experience of physical pain (Eisenberger, Leiberman, & Williams, 2003). Moreover, activity in the right ventral prefrontal cortex, which may regulate the anterior cingulate cortex and has been implicated in the inhibition of pain and negative affect, was associated with lowered psychological distress after ostracism (Eisenberger et al., 2003). There is evidence in the literature that suggests that giving an ostracized target a chance for re-inclusion provides a restorative effect on the four fundamental need states, feelings and mood, regardless if the re-inclusion episode occurred with the same sources or with different sources (Tang & Richardson, 2013).

Although the literature has consistently found immediate psychological distress that occurs as a result of being excluded, it has yielded mixed results as to the factors affecting whether ostracized individuals respond prosocially or antisocially. On one hand, individuals may respond prosocially by conforming to group decisions, paying careful attention to group members who show social cues that signal social inclusion, or treating other prospective friends well. On the other hand, they may instead respond antisocially by withdrawing from others to reinforce the self or acting aggressively toward others (Maner, Miller, Schmidt, & Eckel, 2010).

One factor that may moderate a prosocial response is if the ostracized individual possesses concerns for the future. This is because those who have a high concern for the future (e.g., willingness to sacrifice immediate happiness for future outcomes) as opposed to little concern for the future may be more likely to cooperate with group members (Balliet & Ferris, 2013). However, ostracism has been shown to reduce prosocial behavior which may be due to a decrease in empathy that reduces an individual's desire to help others (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007). Overall, prosocial responses can be adaptive as they help the target be re-included into the group. Working harder on a group task, mimicking a good group member, and joining a new group are all adaptive responses that can help an individual cope with the stress of being ostracized (Williams & Gerber, 2004).

Despite the adaptive nature of prosocial responses to ostracism, some individuals respond antisocially to ostracism. For instance, antisocial responses to ostracism have been linked to reports of anger after an episode of ostracism (Chow, Tiedens, & Govan, 2008). Those who felt angrier after being ostracized were more likely to display antisocial responses such as giving unpleasant snacks to the group members. This response was magnified the more the victims thought that they were unfairly treated and excluded from the group (Chow et al., 2008). Also, individuals who were given more control over administering the onset timing of loud sound blasts to ostracizers after ostracism were less likely to exhibit aggressive responses to their ostracizers (Warburton, Williams, & Cairns, 2004), so aggressive, antisocial responses may be moderated by both anger and perception of control following ostracism. More work is needed to clarify other moderating factors that may influence whether individuals respond either prosocially or antisocially.

The current study utilized the Ostracism Detection Theory (Williams, 2007, 2009) to try to explain emotional and behavioral responses to ostracism. According to Ostracism Detection Theory, three distinct stages characterize the response to ostracism. First, experiencing an episode of ostracism leads to immediate psychological distress along with a decrease in the four fundamental needs or social motives, which include feelings of belonging (the drive to have caring interactions with others), control (the need to perceive having some control over relationships and the environment), meaningful existence (feeling that one's life is valuable), and self-esteem (how one perceives others to perceive one's goodness or worth; Williams & Govan, 2005). Second, the short-term effects of ostracism involve the utilization of resources to regain the four thwarted fundamental need states through prosocial or antisocial responses. The third stage occurs after long-term ostracism in which the resources used to thwart the fundamental need states are depleted, which can lead to despair, hopelessness, and a perception of lower worth.

The literature has yet to uncover why some individuals respond prosocially to ostracism whereas others respond antisocially. According to the Ostracism Detection Theory (Williams, 2009), the specific response strategy to ostracism may be dependent on the specific thwarted need(s) that the target is motivated to reinforce. For instance, threats to belonging and self-esteem might lead to more prosocial responses toward the ostracizers as a way of being re-included such as conforming to the group and working harder on a group task

(Wesselmann & Williams, 2013). On the other hand, threats to control and meaningful existence might lead to antisocial responses that reinforce one's exclusion such as aggression toward group members or others who are similar to the ostracizers (power/provocation needs; Wesselmann & Williams, 2013). Although this assertion has yet to be tested directly using an experimental design, studies have shown an indirect association between for these specific threats and retaliation response tendencies (for a review, see Wesselmann & Williams, 2013). The current study investigated the ability of the model to predict prosocial and antisocial responses to ostracism based on more thwarted self-esteem/belonging needs and meaningful existence/control needs, respectively.

Hypotheses

First, we predicted that ostracized individuals would show more prosocial responses directed toward their perpetrators than included participants even when the perpetrator initiated first contact with the victim. Second, it was expected that ostracized participants would feel improved belonging, self-esteem, control, and meaningful existence after an opportunity for inclusion, relative to the initial ostracism episode. Third, when given a chance for inclusion, we believed that individuals who felt more threats to their sense of belonging and self-esteem and fewer threats to their sense of control and meaningful existence after the initial ostracism episode would be more likely to exhibit prosocial responses to the initial rejecter.

Methods

Participants

Data for 206 participants were included in this study. The original pool included 254 participants, but data for 48 participants were excluded in the analysis because they expressed some awareness of the hypotheses of the study (e.g., themes around ostracism/rejection).[1] In the final pool, most participants were women (65.4%). Participants (97.1%) were first-year college students, followed by 2.9% sophomores. The mean age for the participants was 18.43 years ($SD = 0.60$), with a range from 18 to

23 years. A total of 45.8% were majoring in a field from the college of arts and sciences, 9.8% in the school of business, and 44.4% had not yet declared a major. The breakdown for ethnicity was as follows: 67.5% European American, 11.2% Hispanic, 5.8% Asian American, 1% African American, 1.5% Native American, 1% Pacific Islander, and 12.1% self-rated as having another ethnicity not defined by these categories. Participants received course credit for participating in the study.

Eligibility screening. After Institutional Review Board approval, data recruitment and collection began. All participants provided written informed consent before participating. Data collection was conducted across five academic semesters. All participants were recruited from the psychology department participant pool. They were told that the purpose of the study was to examine how mental visualization was related to how people perform in online games with others.

Randomization. A computer-generated randomization program (www.randomizer.com) was used to randomly assign participants to inclusion versus ostracism for Game 1. For the 206 participants, a total of 42.2% participated in the ostracism condition for Game 1, and all participants were in the inclusion condition for Game 2.

Procedure

Upon arrival, the researcher greeted the participants and immediately took them to a small private enclosed room with a desk and chair, where they signed a consent form to participate and relaxed for 5 min without using their cell phones or doing any work. At the end of the relaxation period, all participants completed a series of questionnaires.

Next, the participant sat down in another private room with a computer to play Cyberball (Williams, 2007; Williams & Jarvis, 2006). The participant was given instructions on how to play the game and was told that he or she would be playing the game with two other students who were logged in to the university network. However, the other two students were actually virtual confederates. Cyberball begins with one of the players throwing the ball to the participant. By mouse-clicking on the appropriate player's icon, the participant then passes the ball to that player. Players randomly assigned to the ostracism condition received the ball only twice in the entire game. Players randomly assigned to the inclusion condition received the ball approximately 33% of the time. In both conditions, there was a total of 30 throws, and the game

---

[1] The statistical analyses for this study were performed on the sample with excluded participants ($n = 206$) and for the full sample ($N = 254$). Results for the full sample yielded similar findings across all analyses including side bias determination, accuracy of reported ball tosses, manipulation checks, group differences in prosocial responses, group differences in fundamental needs, and in all of the association statistics with tosses and needs except for two correlations noted in the last section of the Results.

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

78 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

lasted approximately 4 min. Immediately after the Cyberball game, the participant returned to the previous room and completed the first Aversive Impact Index (AII).

Then the participants played Cyberball a second time. This time, all participants in the current study were included by the other players. The second game appeared the same to participants as the first game except that the participant was told that one of the players in the original game was replaced with a newcomer while the other participant (one of the original excluders) was a repeat player. In the second game, all participants received the ball an equal number of times by both players. The time from the start of Game 1 to Game 2 was approximately 8 min (*SD* = 2.0). When the game ended, all study participants completed the second AII rating in their private room. The participants did not learn of the true hypotheses via the full debriefing until the end of the semester in order to make sure that future participants would not know the hypotheses.

Assessments
Fundamental needs. To measure the fundamental needs of belonging, self-esteem, control, and meaningful existence, participants completed the AII (Williams, Cheung, & Choi, 2000). The AII is a 28-item measure used to measure felt ostracism, feelings, and threats to fundamental needs that has been successfully employed in previous studies (Williams et al., 2000). For purposes of this study, data from felt ostracism used for the manipulation variable check, perception of ball tosses received and initiated, as well as the participants' fundamental needs states. The four fundamental needs scales were belonging (e.g., "I felt like I belonged with the group"; 5 items), self-esteem (e.g., "My self-esteem was high"; 5 items), control (e.g., "I felt I had control over the course of the game"; 5 items) and meaningful existence (e.g., "I felt meaningless"; 5 items), where lower scores on the four needs scales indicated more thwarted needs. The AII alpha scores for the four needs states with the current sample (Game 1, Game 2) were as follows: belonging (.89, .83), self-esteem (.87, .88), Control (.88, .72) and meaningful existence (.82, .80). The AII alpha scores for the 3-item felt ostracism scale used for the manipulation test (see below) for the current sample was .93 for Game 1 and .92 for Game 2.

Prosocial responses. In Game 2, prosocial ball toss scores to the repeat player were determined by a proportion score based on the total number of tosses directed to the repeat player in Game 2 divided by the total number of tosses to both the repeat player in Game 2 and the new player in Game 2. A total of 30 tosses per game were examined for each participant. More frequent ball tosses directed toward the repeat player (the excluder from Game 1) were considered to be indicative of more prosocial responses.

Post-hoc analyses confirmed no concerning trend toward a bias in participants' ball tosses to any particular side in the games or an inaccuracy rate in participants' ability to recall that the repeat player in Game 2 was represented on the right side of the screen. This provided additional evidence that the Cyberball game accurately measured prosocial motivations and that the participants showed reasonably accurate judgments of their prosocial behaviors.

Manipulation Check
Two manipulation checks based on the AII were used to confirm participants' perception of their ostracism status during each of the Cyberball games. These include a felt ostracism scale that included three items (i.e., "I was excluded", "I was ignored", and "I was rejected") which were answered using the same 5-point scale described in the Assessments section, and an open-ended question (i.e., "Assuming that 33% of the time you would receive the ball if everyone received it equally, what percent of throws did you receive?"). For ease of interpretation and cross-study comparison, both median and mean scores are presented for the manipulation check items below.

Mann Whitney tests found that, in Game 1, participants in the ostracism condition reported on the AII that they received an average of 6.41% (*Mdn* = 5%, *SD* = 4.03%) of the ball tosses whereas participants in the Inclusion condition reported receiving an average of 29.01% (*Mdn* = 30%, *SD* = 8.72%) of the ball tosses, *U* = 189.50, *Z* = -13.71, *p* < .001. These values were consistent with reports from other research (Sethi, Moulds, & Richardson, 2013). For felt ostracism in Game 1, ostracized participants (*M* = 12.01, *Mdn* = 12, *SD* = 2.89) reported higher perceived feelings of being excluded /rejected/ignored than the included participants (*M* = 4.79, *Mdn* = 5, *SD* = 2.21), *U* = 1460.00, *Z* = -14.80, *p* < .001.

Game 1 ostracism-Game 2 inclusion participants reported that they received an average of 34.74% (*Mdn* = 33%, *SD* = 8.94%) of the ball

tosses in Game 2. This was no different than the Game 1 inclusion-Game 2 inclusion participants who reported receiving an average of 33.63% ($Mdn = 33\%$, $SD = 9.79\%$) of the ball tosses in Game 2. For the merge variable in Game 2, all participants reported low ratings of being excluded/rejected/ignored ($M = 4.03$, $Mdn = 3$, $SD = 2.05$). However, the Game 1 ostracism-Game 2 inclusion participants reported lower ratings of being excluded/rejected/ignored in Game 2 ($M = 3.56$, $Mdn = 3$, $SD = 1.18$) than Game 1 inclusion-Game 2 inclusion participants ($M = 4.38$, $Mdn = 3$, $SD = 2.44$), $U = 4492.00$, $Z = -1.97$, $p = .04$. These results from Game 1 and 2 suggest that the manipulation for both ostracism and inclusion were successful.

Results

Data Exploration and Analyses

Statistics were computed using Statistical Package for the Social Sciences (SPSS 18.0). The level of significance was intended at $p < .05$ to control for Type I error. Normal distribution assumptions for the two manipulation check variables and all dependent variables were tested using the Kolmogorof-Smirnov goodness of fit tests for each parameter and each cell. Square root and natural log data transformations were unsuccessfully applied on all non-normally distributed parameters. Therefore, Mann Whitney tests were used to investigate group differences in psychological outcomes. Effect sizes ($r = Z / \sqrt{N}$ where $N =$ the total number of cases; Rosenthal, 1991) were calculated for all Mann Whitney tests. Spearman's rank order correlations were calculated to measure the association between ball tosses and fundamental needs at Game 1 and Game 2.

Group Differences in Prosocial Responses Between Game 1 Ostracized and Included Participants

Did participants who were ostracized in Game 1 toss the ball to the ostracizer (the repeat player in Game 2) more or less frequently than participants who were initially included in Game 1? Actual Cyberball data for Game 2 (when all participants who played Cyberball were included) showed that participants who were ostracized in Game 1 tossed the ball to the repeat player in Game 2, on average, 39% of the time ($SD = 17\%$, $Mdn = 40\%$; range = 70%). Included participants in Game 1 tossed the ball to the repeat player in Game 2, on average, 52% of the time ($SD = 11\%$, $Mdn = 50\%$; range = 60%). A Mann-Whitney test showed that compared to included participants, ostracized

participants passed the ball to the repeat player less frequently in Game 2, $U = 2859.50$, $Z = -5.46$, $r = -.38$, $p < .001$ (see Figure 1). In Game 2, the game-assigned first toss went to either the repeat player (right side; 56.8%, $n = 117$) or the participant (43.2%, n = 89); no tosses were assigned to the left player (newcomer) first.

If the first toss in Game 2 went to the repeat player and then the second toss was passed to the participant, Mann-Whitney test showed that the Game 1 group showed differences in the proportion of tosses that the participant directed toward the repeat player, $U = 193$, $Z = -3.36$, $p = .001$, $n = 55$. Specifically, the overall proportion of tosses to the repeat player was lower for the ostracism group ($M = 40\%$, $Mdn = 50\%$, $SD = 17\%$, range = 70%, $n = 27$) than the inclusion group ($M = 55\%$, $Mdn = 50\%$, $SD = 12\%$, range = 60%, $n = 28$).

When the participant was given the first toss, there were significant differences in how the participant directed the second toss depending on Game 1 condition, Pearson $\chi^2 = 12.10$, $n = 89$, $p < .001$. Specifically, among the ostracism group, 44.1% ($n = 15$) directed the toss to the repeat player. Among the inclusion group, 80.0% ($n = 44$) directed the toss to the repeat player.

Group Differences in Fundamental Needs at Games 1 and 2

Did participants who were ostracized in Game

FIGURE 1

Median Ball Tosses (95% Confidence Interval) to the Repeat Player in Game 2 as a Function of Ostracism Status in Game 1
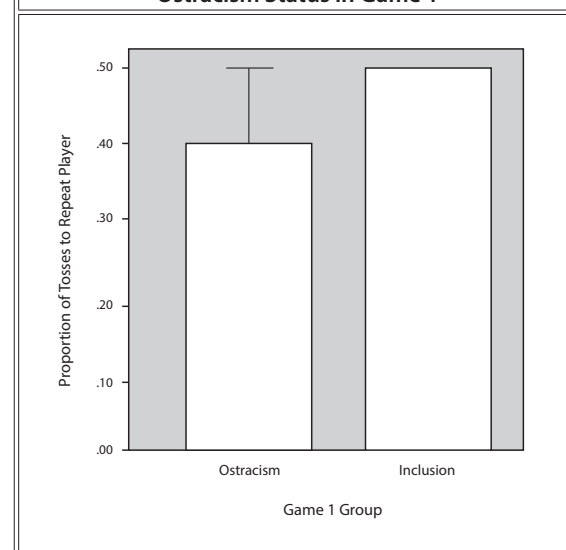
A significant group effect for proportion of ball tosses was found.

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

80 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

1 report lower levels of the four fundamental needs compared to participants who were initially included in Game 1? How did reports of the four fundamental needs compare between the ostracism group and inclusion following the Game 2 inclusion experience? Mann-Whitney tests were conducted separately for Game 1 inclusion and ostracism groups to determine group differences on the four fundamental need states during Game 1 and Game 2. As shown in Table 1, the ostracism group reported lower levels of the four needs during the ostracism experience in Game 1 compared to the inclusion group. However, the Game 1 ostracism group reported higher levels of the four needs during the Game 2 inclusion experience, relative to the Game 1 included group (See Figures 2 and 3, and Table 1). Effect sizes were strong for Game 1 (ranging from $r = -.56$ to $-.74$) and moderate for Game 1 (ranging from $r = -.30$ to $-.43$).

Association Between Prosocial Behavior and Fundamental Needs During Games 1 and 2

Were ball tosses to the repeat player in Game 2 correlated with Game 1 and Game 2 levels of the four fundamental needs? The proportion of tosses passed to the repeat player in Game 2 was positively correlated with Game 1 levels of belonging, $r(203)$ $= .25$, $p <.001$; self-esteem, $r(203) = .20$, $p <.001$; control, $r(203) = .30$, $p <.001$; and meaningful existence, $r(202) = .25$, $p < .001$, for all participants, regardless of ostracism status. The frequency of tosses passed to the repeat player in Game 2 was negatively correlated with Game 2 levels of belonging, $r(203) = -.16$, $p =.02$; self-esteem, $r(203)$ $= -.15$, $p =.02$; control, $r(203) = -.21$, $p = .002$; and meaningful existence, $r(203) = -.19$, $p = .006$, for all participants, regardless of ostracism status (see Table 2). Correlations were performed separately for the inclusion and ostracism groups from Game 1 between proportion of tosses to the repeat player in Game 2 and reports of thwarted needs for Game 1 and Game 2. All observed correlations were statistically insignificant; correlations for the ostracism group ranged from $r = -.19$ to $.18$ and correlations for the inclusion group ranged from $r = -.08$ to $-.01$.

Discussion

The purpose of the study was to investigate the extent to which ostracized individuals responded to their excluders prosocially and to see if these responses were related to the thwarted fundamental needs of belonging, self-esteem, control, and meaningful existence after ostracism and after

an episode of inclusion. Participants played two games of Cyberball, which involved participants being either ostracized or included in the first game. All participants who played Cyberball again were included in the second game. Following both games of Cyberball, the participants completed questionnaires indicating the extent to which they agreed with statements about how they felt during the game.

The first hypothesis was that ostracized individuals in Game 1 would show more prosocial responses to their ostracizers in Game 2. Contrary to our expectations, Game 1 ostracized participants displayed fewer prosocial responses (i.e., more antisocial responses) to their perpetrator by throwing the ball to them significantly fewer times in Game 2 than the initially included participants did. Among participants who were given the first ball toss in Game 2, the initially ostracized group tossed it to the repeat player significantly less times than participants in the initially included group. Even when the repeat player initiated contact first with the participant, ostracized participants still continued to pass the ball to them less frequently, and when the participant was given the first toss (or the first opportunity for a prosocial response), he/she passed it less to the repeat player if ostracized in Game 1. This suggests that an initial prosocial attempt from the ostracizer does not affect the tossing tendency to the ostracizer in Game 2 for the initially ostracized participants. Although previous studies demonstrated the use of both prosocial and

TABLE 1					
Group Differences for Game 1 Condition					
	Ostracism	Inclusion	*U*	*p*	*r*
	Mdn (Range)	Mdn (Range)			
Game 1					
Belonging	9 (20)	19 (18)	641.50	<.001	-.74
Self-Esteem	11 (17)	17 (18)	1746.50	<.001	-.56
Meaningful Existence	11 (20)	20 (19)	1101.00	<.001	-.67
Control	6 (20)	15 (20)	1116.00	<.001	-.69
Game 2					
Belonging	23 (11)	21 (18)	2580.00	<.001	-.43
Self-Esteem	20 (15)	17 (19)	3297.50	<.001	-.31
Meaningful Existence	22 (14)	19 (19)	3005.50	<.001	-.36
Control	19 (16)	16 (20)	3292.00	<.001	-.30

Note. For Game 1, $N = 206$ except for Meaningful Existence ($N = 205$). For Game 2, $N = 206$ except for Control ($N = 205$).

antisocial responses to ostracism, most of these published studies have focused on one episode of ostracism, followed by an opportunity to determine how participants would act following the ostracism. In this study, participants were included following ostracism and so it was expected that this inclusion would contribute to more prosocial responses, especially if the moderating factors shown to be associated with more antisocial responses (i.e., thwarted control and anger) were assumed to be mitigated by the inclusion experience. Perhaps, there were other moderating factors not mitigated by the inclusion experience following ostracism, such as attributions about the ostracizer (e.g., "The ostracizer might just ostracize me again.") or ruminations about the ostracism experience (e.g., "This was a bad experience for me."). Research has shown that ruminating about ostracism as opposed to being distacted after ostracism tends to hinder recovery from threats to the fundamental needs states (Wesselmann, Ren, Swim, & Williams, 2013).

The second hypothesis was that ostracized participants would feel significantly higher levels of belonging, self-esteem, control, and meaningful existence after inclusion (in Game 2), whereas the ostracism episode in Game 1 would contribute to more thwarted needs in the ostracism group. As expected, ostracized participants reported more threats to the fundamental needs after

Game 1 compared to included participants. Also as expected, after Game 2 inclusion, the initially ostracized participants reported significantly higher scores on all four fundamental need states, relative to initially included participants. The importance in our findings resided in how ostracized participants felt emotionally after an opportunity for inclusion. Most of the previous literature on ostracism has been limited to investigating the short-term effects of one ostracism episode. The current findings validate other published studies showing the immediate negative effects of thwarted needs on ostracized participants, relative to included participants (Williams, 2007, 2009). Results of this study were in line with one of the few published studies to date examining the psychological impact of inclusion after ostracism. Specifically, similar to Tang and Richardson (2013), the current findings showed that inclusion after ostracism has a restorative effect on people's needs for belonging, self-esteem, control, and meaningful existence.

As suggested by the Ostracism Detection Theory (Williams, 2009), the third hypothesis was that individuals who reported more threats to belonging and self-esteem and less threats to control and meaningful existence after the initial ostracism episode would be the most likely to display prosocial responses to the ostracizer, when given the opportunity in Game 2. In this


FIGURE 2

Median Reported Post-Game 1 Fundamental Need States (95% Confidence Interval) as a Function of Ostracism Status in Game 1
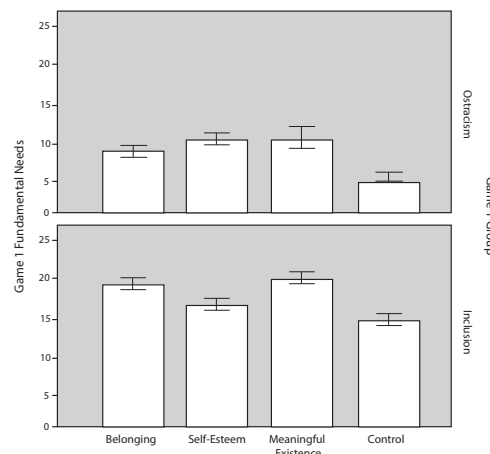
For those ostracized in Game 1, significant differences in reported need states in Game 1 were found for all four fundamental needs.

FIGURE 3

Median Reported Post-Game 2 Fundamental Need States (95% Confidence Interval) as a Function of Ostracism Status in Game 1
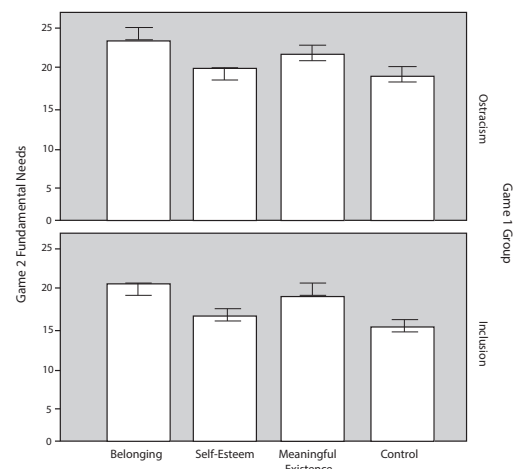
For those ostracized in Game 1, significant differences in reported need states in Game 2 were found for all four fundamental needs.

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

82 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

study, the association between thwarted needs and prosocial responses was not specific to being ostracized or included in Game 1. Rather, more Game 2 prosocial responses were associated with higher Game 1 needs states and lower Game 2 needs states on all four fundamental needs. These findings do not support the suggestion that more prosocial responses following ostracism are related to specific threats to self-esteem/belonging whereas more antisocial responses following ostracism are specific to threats to meaningful existence /control. Perhaps higher need states during Game 1 contributed to a form of the feel-good, do-good phenomenon in which participants felt good enough to act more prosocially with the repeat player in Game 2 regardless of whether they were ostracized or included in Game 1. On the other hand, in Game 2, more thwarted need states for the four needs (rather than belonging/self-esteem specifically or the experience of prior ostracism) were associated with more prosocial tendencies during the game itself. In order to uncover the reason why these associations were observed to be different for Games 1 and 2, researchers need to experimentally examine whether fundamental needs states during the ostracism experience results in different rates of prosocial outcomes during the ostracism and in subsequent interactions with the ostracizers. Whatever the case may be, it appears that the need states of the participants after both games of Cyberball were more strongly related to prosocial responses, rather than the experience of ostracism or inclusion.

There were several limitations to the study. First, the study focused on only one form of ostracism. Due to the nature of Cyberball and the instructions, the study was specific to cyber-ostracism. Conducting a study where the participant was ostracized by individuals present in the same room may have had a much greater effect on the participant's psychological outcomes.

Second, the sample of the study hampered the generalizability of the results. Although ostracism is painful throughout adulthood, the sample of the present study consisted primarily of European American female first year college students, which limits the generalizability to other groups. Third, precautions should be taken in the future to make sure that the participants do not form ideas about study hypotheses. The cover story used for the Cyberball games was similar to other cover stories used in many ostracism studies, but some participants who were ostracized had an idea about the

study hypotheses, prompting the need to discard some of the data. Future research should revise the cover story or use filler questionnaires to prevent participants from identifying the study goals. Still, the results for the full sample and the modified sample were consistent.

Future research could also investigate the influence of different forms of ostracism and individual and situational factors related to prosocial responses. A good procedure that can be adapted is the O-cam procedure (Goodacre & Zadro, 2010; Tang & Richardson, 2013). The O-cam procedure uses a webcam to have the participant interact with two other confederates. Using a webcam would give the participant the face-to-face interaction that occurs in social ostracism and the experience of cyber-ostracism that allows for the easy manipulation of conditions. The two confederates could interact with the participant and induce ostracism, which might elicit a greater emotional and behavioral response than using cyber-ostracism through Cyberball.

In summary, the study utilized the Ostracism Detection Theory (Williams, 2005, 2007) to study emotional (fundamental needs states) and behavioral (ball tossing) responses to ostracism and whether these responses were related to inclusion following ostracism. According to the theory, when people experience ostracism, they immediately feel psychological distress and are motivated to remove the pain and fortify the thwarted fundamental need through a set of responses. There was partial support for the predictions expounded by the model. This study validated the model in that the immediate effects of ostracism through the first game of Cyberball were a lowering of the four

TABLE 2		
Association Between Prosocial Behavior and Fundamental Needs During Games 1 and 2		
	r	*p*
Game 1		
Belonging	.25	<.001
Self-Esteem	.20	<.001
Meaningful Existence	.25	<.001
Control	.30	<.001
Game 2		
Belonging	-.16	.02
Self-Esteem	-.15	.02
Meaningful Existence	-.19	.006
Control	-.21	.002

83

fundamental needs of belonging, self-esteem, control, and meaningful existence. Further, inclusion in Game 2 significantly improved the levels of fundamental needs for the Game 1 ostracized participants, in relation to the Game 1 included participants. Clearly, the Game 2 inclusion experience had an ameliorative influence on fundamental needs states for initially ostracized participants. Although they felt better in Game 2, initially ostracized participants were less prosocial (more antisocial) in Game 2 to their ostracizer than initially included participants. Williams (2009) prediction that threats to belonging and self-esteem would be more likely to elicit prosocial responses was not observed in this study. Rather, threats to the fundamental needs were associated with all four threats in different ways in Game 1 (where both inclusion and ostracism occurred) and in Game 2 (where only inclusion occurred). Overall, this study and the rest of the literature investigating ostracism have brought the scientific community closer to understand the mechanisms that underlie ostracism and how we may be able to help people of all ages cope with the pain that comes from being ostracized from a group. Because ostracism can occur in all walks of life, understanding how we may be able to help others cope with ostracism will help us establish better relationships with each other.

References

Balliet, D., & Ferris, D. (2013). Ostracism and prosocial behavior: A social dilemma perspective. *Organizational Behavior and Human Decision Processes, 120*, 298–308. doi:10.1016/j.obhdp.2012.04.004

Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Twenge, J. M. (2005). Social exclusion impairs self-regulation. *Journal of Personality and Social Psychology, 88*, 589–604. doi:10.1037/0022-3514.88.4.589

Chow, R. M., Tiedens, L. Z., & Govan, C. L. (2008). Excluded emotions: The role of anger in antisocial responses to ostracism. *Journal of Experimental Social Psychology, 44*, 896–903. doi:10.1016/j.jesp.2007.09.004

Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science, 302*, 290–292. doi:10.1126/science.1089134

Goodacre, R., & Zadro, L. (2010). O-Cam: A new paradigm for investigating the effects of ostracism. *Behavior Research Methods, 42*, 768–774. doi:10.3758/BRM.42.3.768

Maner, J. K., Miller, S. L., Schmidt, N. B., & Eckel, L. A. (2010). The endocrinology of exclusion: Rejection elicits motivationally tuned changes in progesterone. *Psychological Science, 21*, 581–588. doi:10.1177/0956797610362676

Nezlek, J. B., Wesselmann, E. D., Wheeler, L., & Williams, K. D. (2012). Ostracism in everyday life. *Group Dynamics: Theory, Research, and Practice, 16*, 91–104. doi:10.1037/a0028029

Rosenthal, R. (1991). *Meta-analytic procedures for social research (Rev. ed.)*. Thousand Oaks, CA: Sage Publications. doi: http://dx.doi.org/10.4135/9781412984997

Sethi, N., Moulds, M. L., & Richardson, R. (2013). The role of focus of attention and reappraisal in prolonging the negative effects of ostracism. *Group Dynamics: Theory, Research, and Practice, 17*, 110–123. doi: 10.1037/a0032436

Tang, H. H. Y., & Richardson, R. (2013). Reversing the negative psychological sequelae of exclusion: Inclusion is ameliorative but not protective against the aversive consequences of exclusion. *Emotion, 13*, 139–150. doi:10.1037/a0029521

Twenge, J. M., Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Bartels, J. M. (2007). Social exclusion decreases prosocial behavior. *Journal of Personality and Social Psychology, 92*, 56–66. doi:10.1037/0022-3514.92.1.56

Warburton, W. A., Williams, K. D., & Cairns, D. R. (2004). When ostracism leads to aggression: The moderating effects of control deprivation. *Journal of Experimental and Social Psychology, 42*, 213–220. doi:10.1016/j.jesp.2005.03.005

Wesselmann, E. D., & Williams, K. D. (2013). Ostracism and stages of coping. In C. N. DeWall (Ed.), *The Oxford handbook of social exclusion* (pp. 20–30). New York, NY: Oxford Press.

Wesselmann, E. D., Ren, D., Swim, E., & Williams, K. D. (2013). Rumination hinders recovery from ostracism. *International Journal of Developmental Science, 7*, 33–39. doi:10.3233/DEV-1312115

Williams, K. D. (2007). Ostracism. *Annual Review of Psychology, 58*, 425–452. doi: 10.1146/annurev.psych.58.110405.085641

Williams, K. D. (2009). Ostracism: A temporal need-threat model. In M. Zanna (Ed.), *Advances in Experimental Social Psychology* (Vol. 41, pp. 279–314). New York, NY: Academic Press. http://dx.doi.org/10.1016/S0065-2601(08)00406-1

Williams, K. D., & Jarvis, B. (2006). Cyberball: A program for use in research on interpersonal ostracism and acceptance. *Behavior Research Methods, 38*, 174–180. doi:10.3758/BF03192765

Williams, K. D., & Gerber, J. (2004). Ostracism: The making of the ignored and excluded mind. *Interaction Studies: Social Behaviour and Communication in Biological and Artificial Systems, 6*, 359–374. doi:10.1075/is.6.3.04wil

Williams, K. D., & Govan, C. L. (2005). Reacting to ostracism: Retaliation or reconciliation? In D. Abrams, M. A. Hogg & J. M. Marques (Eds.), *The social psychology of inclusion and exclusion* (pp. 47–62). New York, NY: Psychology Press.

Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology, 79*, 748–762. doi:10.1037/0022-3514.79.5.748

Williams, K. D., & Nida, S. A. (2011). Ostracism: Consequences and coping. *Current Directions in Psychological Science, 20*, 71–75. doi:10.1177/0963721411402480

Author Note. Julian Leiro, Psychological Sciences Department, University of San Diego.

Please address correspondence to Julian Leiro at j_leiro10@yahoo.com or to Jennifer Zwolinski, PhD at the University of San Diego, Psychological Sciences Department, 5998 Alcala Park, San Diego, CA 92110. E-mail: jzwolinski@sandiego.edu.

Journal Submissions

The Psi Chi Journal of Psychological Research encourages all Psi Chi members—undergraduate students, graduate students, and faculty—to submit manuscripts for publication. Submissions are accepted for review throughout the year. Although manuscripts are limited to empirical research, they may cover any topical area in the psychological sciences.

Submission basics:

- Please send ALL submissions and inquiries through our portal. Manuscripts are peer reviewed, which takes approximately 10–12 weeks.
- Authors' work is judged in comparison to others at their developmental level.
- Once the work is peer reviewed, the primary author will receive e-mail notification (approximately three months after initial submission) for
  - acceptance,
  - acceptance with minor revisions,
  - the encouragement for major revisions and resubmission, or
  - rejection.
- Accepted manuscripts are generally published within a year after initial submission according to submission dates, revision turnaround time, and at the discretion of the Editor.
- If you have any questions about the submission process, please e-mail the Managing Editor at psichijournal@psichi.org.

What to Submit:

1. A **cover letter** that includes
   - identifying information for the primary author, including an e-mail address;
   - the primary author's Psi Chi membership ID number;
   - a description of the primary author's educational status (e.g., an estimated or actual date of graduation, or description of faculty appointment);
   - a statement that the manuscript is original (not published or accepted for publication elsewhere); and
   - a statement that the research was carried out with approval of an institutional review board and following proper procedures for the protection of human participants or animal subjects.
2. For research papers with an undergraduate listed as the first author, submit a **sponsoring statement** that specifies
   - the research adhered to APA ethical standards;
   - the mentor has read and critiqued the manuscript on
     - content,
     - method,
     - APA style,
     - grammar, and
     - overall presentation; and
     - the planning, execution, and writing of the manuscript represent primarily the work of the undergraduate student.
3. A **cover page** in APA style (with manuscript title, authors' names, institutional affiliations, and possibly an author note).
4. A **masked manuscript** following these guidelines:
   - All authors' identifying information (e.g., name and school) is removed from all sections of the entire manuscript.
   - The manuscript is in Microsoft Word.
   - The manuscript includes figures, tables, and charts generated in either Microsoft Word or Excel.
   - Scanned images or illustrations (black and white only, no color) must have a resolution of at least 600 dpi resolution.
   - The manuscript must adhere to APA style.

Journal Submissions

The Psi Chi Journal of Psychological Research encourages all Psi Chi members—undergraduate students, graduate students, and faculty—to submit manuscripts for publication. Submissions are accepted for review throughout the year. Although manuscripts are limited to empirical research, they may cover any topical area in the psychological sciences.

Author Checklist:

Prior to submission, check:

1. Is the primary author a Psi Chi member?
   o The **first author** of a submitted manuscript must be a member of Psi Chi at the time of submission.
   o Additional authors may include non-Psi Chi members.
2. Is the manuscript empirical?
   o **Empirical** articles include original data collection, secondary data analysis, or meta-analysis.
3. Is the contribution original?
   o Only **original manuscripts** (not published or accepted for publication elsewhere) will be accepted.
4. Is this paper ready to be judged by reviewers?
   o Reviewers will be prompted to evaluate your paper based on the **level of work** expected of undergraduate students, graduate students, or faculty.
   o Authors who completed their research as an undergraduate student may submit it after graduation; however, if those students are enrolled in a graduate program, the work will be compared to that of graduate students rather than other undergraduates.

5. Is the research timely?
   o The Editor reserves the right not to review projects completed more than one year before submission.
6. For faculty authors, is a student coauthor included?
   o Faculty must have **at least one student coauthor**. All authors who submit work they completed as an undergraduate must have a faculty mentor who has reviewed the manuscript and affirmed the work was primarily that of the student(s).
7. Is the manuscript **fewer than 35 pages** including all references, tables, figures, and appendices?
8. Has the manuscript been written according to **APA Style**?
   o All manuscripts must be prepared according to the Publication Manual of the American Psychological Association (6th ed.).
   o Refer to the "Checklist for Manuscript Submission" found on APA's website to check the accuracy of your paper for APA style prior to submission.
9. Does the manuscript reference other *Psi Chi Journal* articles? (We highly encourage this!)

SUMMER 2014

PSI CHI
JOURNAL OF
PSYCHOLOGICAL
RESEARCH

86 COPYRIGHT 2014 BY PSI CHI, THE INTERNATIONAL HONOR SOCIETY IN PSYCHOLOGY (VOL. 19, NO. 2/ISSN 2164-8204)

Psi Chi
Journal of
**Psychological
Research**

SPRING 2012 | VOLUME 17 | ISSUE 1

PSI CHI
THE INTERNATIONAL HONOR
SOCIETY IN PSYCHOLOGY

ISSN: 2164-8204
Published by Psi Chi,
The International Honor
Society in Psychology

Welcome to the Psi Chi Journal
of Psychological Research site. Please login.

Login Name

Password

Login   Reset

New Users: Please register here ?
Forgotten Login and Password ?

To ensure proper functionality of this site, both JavaScript and Cookies must be enabled in your browser.

Online Journal Submission Process

All Psi Chi undergraduates, graduates, and faculty* are invited to submit their research to the *Psi Chi Journal of Psychological Research* through the new web based manuscript submission, tracking, and peer review software solution. Better than email submissions used in the past, this software allows users to create personal accounts to make the submission process more efficient.

Four items are required for all submissions:

1) **Cover Letter**
Include primary author's education status, manuscript originality statement, IRB approval

2) **Sponsoring Statement**
Undergraduate first authors only

3) **Cover Page**
Author names, school affiliation, and any author note

4) **Masked Manuscript**
MS Word with all personal information removed

Simply register an account, then click Submit Manuscript:

1) **Upload Files**
Files can be removed, replaced, or reorganized

2) **Enter Manuscript Information**
E.g., title, abstract, authors, keywords, etc.

3) **Review Manuscript Material**
Summary of all information/files submitted

4) **Submit Manuscript**
Receive email confirmation

New software benefits:

- Allows users to track their manuscripts' progress

- Inserts multiple files including cover letters, manuscripts, and figures

- Permits users to prioritize files and coauthors

- Checks for mistakes in the submission process and points out any errors

- Streamlines the process for authors and reviewers

* Psi Chi member ID number required

Register an account: http://pcj.msubmit.net/cgi-bin/main.plex
Tutorial videos: http://www.ejpress.com/demos

PSI CHI
THE INTERNATIONAL HONOR SOCIETY IN
PSYCHOLOGY