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Subjective Anxiety and Behavioral Avoidance: Gender, Gender Role, and Perceived Confirmability of Self-report

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Abstract

Commonly reported gender effects for differential vulnerability for anxiety may relate to gender socialization processes. The present study examined the relationship between gender role and fear under experimental conditions designed to elicit accurate fear reporting. Undergraduate students ($N = 119$) completed several self-report measures and a behavioral avoidance task (BAT) with a tarantula while wearing a heart rate monitor. Gender roles were operationalized as instrumentality and expressiveness, as measured by the Personal Attributes Questionnaire (Spence, Helmreich, & Stapp, 1975). As expected, women reported greater subjective anxiety and were more avoidant of the tarantula than men. Regardless of gender, low levels of instrumentality were associated with greater avoidance of the tarantula. The hypothesis that men underreport fear compared to women and that gender role differences underlie this reporting bias was not supported. In spite of a ceiling effect on the BAT, results of this study confirm the relevance of gender role in understanding gender effects in fear and anxiety.

Keywords: gender role, anxiety, gender differences, behavioral avoidance

1. Introduction

Women are substantially more likely to demonstrate and report fear and anxiety than men across the life span. Recent reviews of the gender¹ effects in anxiety suggest that risk factors are moderated by gender socialization processes that shape gender-specific expectations regarding the expression of, and the acceptable means of coping with, anxiety (e.g., McLean & Anderson, 2009). According to Bem's (1981) widely cited gender schema theory, all individuals possess some degree of masculine traits, characterized by instrumental (i.e., cognitive and task-oriented) and aggressive behaviors, and feminine traits, characterized by expressive (i.e., emotional and interpersonally oriented) and affiliative behaviors. During gender role development, boys and girls learn socially prescribed behaviors, traits, and skill interests that are consistent with their gender. For example, the expression of fear and anxiety may be considered less consistent with the masculine gender role (e.g., Bem, 1981; Spence and Helmreich, 1978), and fearful behavior may therefore be less tolerated in boys than in girls (Stevenson-Hinde & Shouldice, 1993). Caregivers and other socialization agents (e.g., teachers, peers, media) may encourage gender-conforming behaviors by differentially reinforcing activity and assertiveness among boys and anxious behaviors among girls.

1.1. *The influence of gender role in fear and anxiety*

Several studies have examined how gender roles relate to scores on standard fear scales, such as the fear survey schedule (Wolpe & Lang, 1977) or the fear survey schedule for children-II (Gullone & King, 1992). Among children, greater fear reporting has been associated with higher levels of femininity (Brody, Hay, & Vandewater, 1990; Muris, Meesters, & Knoop, 2005) and lower levels of masculinity (Ginsburg & Silverman, 2000). Similar findings are seen in adults, with some studies showing that fear relates positively with femininity (Tucker & Bond, 1997), others showing a negative association with masculinity (Arrindell, 2000; Arrindell et al., 1993), and others finding that both high femininity and low masculinity are related to elevated fear (Carey, Dusek, & Spector, 1998). Studies examining group differences in gender role have found that participants classified as feminine report greater fear than those classified as masculine (Brehony, 1983; Carsrud & Carsrud, 1979; Dillon et al., 1985).

This research indicates that gender roles are clearly important to our understanding of the gender effects in fear. In fact, gender roles appear to be more closely related to fear and anxiety than biological sex (Brody et al., 1990; Moscovitch, Hofmann, & Litz, 2005; Palapattu, Kingery, & Ginsburg, 2006), though a subset of these studies has found that biological sex significantly predicts reported fear even after controlling for gender role (Arrindell et al., 1993; Dillon et al., 1985).

1.2. *The influence of reporting bias*

One explanation for gender effects in anxiety is that women are more willing than men to report fear and anxiety. Men may be motivated to underreport fear and anxiety because these constructs are incompatible with the traditional masculine gender role and may suggest to others that they are weak or vulnerable (Barlow, 1988). The traditional feminine

gender role, in contrast, bears fewer restrictions on the expression of fear and anxiety and allows women to endorse them with less risk of negative social consequences.

To examine whether men underreport on fear surveys, Pierce and Kirkpatrick (1992) asked participants to complete a fear survey on two separate occasions. During the first assessment, women reported much greater fear than men, as expected. Participants later returned and completed the same self-report measure, but this time they were told that their responses would be “verified” by physiological measures (e.g., heart rate). When participants believed that the truthfulness of their responses would be independently assessed, men, but not women, significantly increased their fear ratings compared to their responses during the first assessment. However, women still reported greater fear than men even during the “verifiable” assessment, suggesting that a reporting bias does not fully account for the gender effect (Pierce & Kirkpatrick, 1992).

Similar results were found in a study examining gender effects in trait anxiety. Egloff and Schmukle (2004) found that women reported greater trait anxiety than men on both an explicit and implicit tests, but that the effect size for gender was approximately half as large on the implicit measures as it was on the explicit measure. In summary, men appear to underreport their true level of fear (Pierce & Kirkpatrick, 1992) and anxiety (Egloff & Schmukle, 2004). However, given the significant gender effects on the “verifiable” fear survey and on the implicit measures of anxiety, reporting biases do not seem to fully account for the observed differences.

1.3. The relationship between reported fear and behavioral avoidance

Studies of overt behavior during fearful conditions suggest that avoidance is partly a function of gender role expectations. For example, a study by Speltz and Bernstein (1976) examining behavioral avoidance among individuals who were fearful of snakes found that, compared to snake-fearful women, equally fearful men showed less avoidance. This suggests that gender effects in avoidance behavior emerge even when controlling for fear levels. Interestingly, the gender effect in avoidance was significantly smaller under high social-demand conditions than under low social-demand conditions, suggesting that overt fear behavior is influenced by social expectations (Speltz & Bernstein, 1976).

Surprisingly, however, only one study has directly examined the influence of gender role on behavioral avoidance. Using a similar design to that of Speltz and Bernstein (1976), Gallacher and Klieger (1995) found that gender and gender role were each correlated with fear of snakes, but not with behavioral avoidance of a snake. The authors concluded that gender role affects the willingness to report fear, but does not influence behavioral avoidance. Interpretability of these findings is limited, however, because behavioral avoidance scores in this study were uniformly low. This ceiling effect may have obscured a relationship between gender role and avoidance that would have been evident given a more challenging task.

1.4. The role of avoidance in anxiety

The fact that gender effects in fears and phobias increase throughout childhood may reflect differential extinction rates to developmentally appropriate fears (Fredrikson, Annas,

Fischer, & Wik, 1996). Compared to girls, boys may receive greater reinforcement for confronting feared situations and for behaving in ways that provide opportunities for emotional processing of fears. According to the emotional processing theory (Foa & Kozak, 1985; Foa & Kozak, 1986; Foa, Huppert, & Cahill, 2006), pathological associations among stimuli, responses, and their meanings can be modified through exposure to the feared stimulus in the absence of anticipated harm. Exposure brings about new learning by providing corrective information about the safety of previously feared thoughts, sensations, situations, and activities (Bouton, 2000; Rescorla, 2001). Thus, socialization that encourages exposure to feared stimuli would facilitate the emotional processing of feared stimuli.

Assuming that the expression of fear and avoidance is less acceptable among men, boys may learn that they are expected to display bravery and purposeful, adaptive coping behavior when faced with anxiety-provoking situations (Bem, 1981; Golombok & Fivush, 1998). This has clear implications for how males learn to respond and cope with fear and anxiety. Research by Greif, Alvarez, and Ulman (1981) found that mothers are more likely to discuss emotional states with their daughters, and more likely to discuss the causes and consequences of the feelings with their sons. Presumably, this would encourage boys to focus on problem solving and gaining control over their emotion, rather than on the experience of the emotion itself. Learning to cope with anxiety in this problem-focused manner may help equip males with the instrumental traits and skills that prevent excessive fears or other anxiety disorders from developing. In contrast, a traditional feminine gender role that deemphasizes autonomy and mastery while promoting dependency and expectations of protection would be more compatible with avoidance behavior.

1.5. The current investigation

Social learning models of anxiety assign a key role to avoidance behavior in the development and maintenance of anxiety disorders. Yet, as discussed earlier, the influence of gender roles on behavioral avoidance remains largely untested. Examining fear and avoidance behavior in vivo and under experimental conditions that are likely to elicit accurate fear reporting would provide a more rigorous test of the influence of gender role on fear and anxiety than relying solely on self-report.

The present study examined fear reporting and behavioral avoidance using a post-test only, independent groups design. Participants completed self-report questionnaires and then completed a behavioral avoidance task (BAT) with a spider while wearing a heart rate monitor. Participants were randomly assigned to one of two conditions: in the "Verifiable heart rate (HR)" condition, participants were told that, because the heart rate monitor would provide an accurate measure of their true fear, it was important that they provide accurate fear ratings; in the "irrelevant HR" condition, participants were told that heart rate is not an accurate measure of fear, and that the heart rate monitor was being tested for use in another study. Based on previous research and current theories of gender socialization, we hypothesized the following:

1. Men will report greater subjective anxiety in the Verifiable HR condition than the Irrelevant HR condition, but women will report a similar level of subjective anxiety in both conditions.
2. Individuals high in the masculine trait instrumentality will report greater subjective anxiety in the verifiable HR condition than the irrelevant HR condition. In contrast, individuals high in the feminine trait expressivity will report a similar level of subjective anxiety in both conditions.
3. Gender (women > men) and gender role (expressivity > instrumentality) will each predict greater levels of self-reported spider fear, subjective anxiety, and behavioral avoidance.
4. Gender roles will account for a greater proportion of the variance in subjective anxiety and behavioral avoidance than gender alone.

2. Method

2.1. Sample

Participants were 109 psychology students (50 men) aged 18–43 (M age = 20.47, SD = 3.01) who had volunteered to participate in a study on “emotional correlates of approach and avoidance” in return for course credit. The spider was not mentioned in the study description in order to reduce selection bias. In order to recruit an approximately equal number of men and women, quota-sampling procedures were used once a sufficient number of women had been recruited. The racial/ethnic composition of the sample was representative of the community from which the sample was drawn: 79.8% were European-American (non-Hispanic), 10.1% were Asian American, 4.6% were Hispanic, 2.8% identified as “other,” 1.8% were African American (non-Hispanic), and .9% were Middle Easterner.

2.2. Measures

2.2.1. Gender role

Gender role was measured using the Personal Attributes Questionnaire (PAQ; Spence, Helmreich, & Stapp, 1975). The PAQ includes three subscales: a masculinity (M) scale, which assesses stereotypical masculine qualities such as independence and competitiveness, a femininity (F) scale, which assesses stereotypical feminine qualities such as warmth and devotion to others (Spence and Helmreich, 1978), and a masculinity-femininity (M-F) scale, which has not been widely used in research and was not scored in this study. Each scale includes eight items rated on a 5-point scale that juxtaposes characteristics with their presumed opposite (e.g., *very passive*–*very active*) or with their negation (e.g., *not at all competitive*–*very competitive*). The PAQ has demonstrated adequate internal consistency (Toller, Suter, & Trautman, 2004) and test-retest reliability (Yoder, Rice, Adams, Priest, & Prince, 1982). We selected the PAQ for this study because it has a more parsimonious and homogeneous factor structure than other gender role measures and because it is described as a

measure of instrumentality and expressiveness, rather than the more global terms of masculinity and femininity. The Cronbach's alphas were .66 for the PAQ-F and .63 for the PAQ-M in the present study, indicating questionable internal consistency (George & Mallery, 2003).

2.2.2. *Fear of spiders*

The Fear of Spiders Questionnaire (FSQ; Szymanski & O'Donohue, 1995) is an 18-item measure of fear and avoidance of spiders. Items are rated on an 8-point Likert-scale, from 0 (strongly disagree) to 7 (strongly agree). The FSQ has excellent internal consistency (Szymanski & O'Donohue, 1995) and test-retest reliability (Muris & Merckelbach, 1996), adequate convergent validity with the spider phobia questionnaire (SPQ; Klorman, Hastings, Weerts, Melamed, & Lang, 1974), and discriminate validity (Szymanski & O'Donohue, 1995). The Cronbach's alpha for the FSQ in the present study was .98, indicating excellent internal reliability.

2.2.3. *Behavioral avoidance task*

Behavioral avoidance tasks (BATs) provide an objective measure of the degree of avoidance of specific stimuli. The BAT steps in this study were modeled on those developed by Woody, McLean, and Klasen (2005) and consisted of 12 carefully graded steps: opening the door to the testing room (step 1); entering the testing room (step 2); looking at a tarantula in the clear terrarium about 3 m from the door (step 3); approaching the spider at measured increments until the participant was standing directly in front of the terrarium (steps 4 through 6); touching the outside wall of the terrarium (step 7); removing the lid of the terrarium (step 8); touching the inside wall of the terrarium (step 9); touching the floor of the terrarium (step 10); gently touching the spider for 1 s with 1 finger (step 11); and gently touching the spider for 3 s with 2 fingers (step 12). BAT scores were calculated on a 12-point scale, ranging from 0 (did not open door to testing room) to 12 (touched the spider for 3 s with 2 fingers).

Subjective anxiety was measured immediately before and after the BAT using the subjective units of distress scale (SUDS; Wolpe & Lazarus, 1966). Ratings were made on a scale from 0 to 100 (i.e., 0 = no anxiety: completely calm and relaxed, to 100 = very severe anxiety: the worst you have ever encountered).

2.2.4. *Post-experimental inquiry*

A brief 8-item "feedback questionnaire" was used to assess hypothesis guessing and the credibility of the experimental manipulation. One key item asked participants to describe their understanding of the purpose of the heart rate monitor. To control for the influence of familiarity with the study stimulus, a second key item asked participants about their previous experience with spiders (e.g., had a pet tarantula).

2.3. Materials

2.3.1. Spider

The spider used for this study was a large Chilean rose tarantula whose legs span at the widest point measured 8 cm. This species is not dangerous to humans and is generally docile, calm, and slow-moving (Webb, 1992).

2.3.2. Heart rate monitors

The heart rate monitor consisted of electrodes attached to a belt worn under the shirt in direct contact with the chest and a watch monitor worn around the wrist. Although the participants were told that the monitors would be recording changes in their heart rate, no heart rate data were obtained. Research has shown that heart rate is not reliably related to fearful avoidance (Jennings, 1981) or self-reported fear of visually depicted fearful stimuli (Pierce & Kirkpatrick, 1992). In fact, Edgerly and Levis (2005) found that heart rate was least effective in discriminating participants' fear levels than behavior, skin conductance amplitude and level, and self-report. In this study, the heart rate monitors were not used to assess heart rate but to persuade participants in the "verifiable HR" condition that their fear ratings during the BAT would be verified by heart rate data.

2.4. Procedures

The experiment involved two phases: a self-report questionnaire phase and behavioral assessment phase, with a separate consent process preceding each phase. After completing the self-report questionnaires, participants were told that the next phase of the study involved completing a task in which they would be asked to approach a tarantula in graduated steps and to provide ratings of how they were feeling during the task using a 0–100 scale. Participants were told that they could terminate the task at any point. In order to reduce experimental demand, participants were told that although there is no actual danger in this situation, it was expected that few people would fully complete the task.

Participants were randomly assigned to one of two conditions: the "verifiable heart rate (HR)" condition and the "irrelevant HR" condition. Participants in the verifiable HR condition were told that the purpose of the heart rate monitor is to provide an independent measure of their true fear level. Replicating the instructions used by Pierce and Kirkpatrick (1992), the experimenter stated: "Heart rate is one of the measures used in a lie detector test because it changes with your emotions. This makes it important to rate your fear level as accurately as possible, because we will compare your answers with changes in your heart rate." Participants assigned to the irrelevant HR condition were told that the heart rate monitor was unrelated to the hypotheses of the study, that research has shown that heart rate has no relationship to an individual's true level of fear, and that the responsivity of the equipment when worn on mobile participants was being tested for a future study.

Next, a second experimenter naïve to the participant's assigned condition provided instruction in how to attach the heart rate belt and asked that the participant wash his or her hands thoroughly using unscented soap because tarantulas may be sensitive to various

fragrances. The experimenter then reviewed the steps of the BAT and obtained an anticipatory SUDS rating. The experimenter then invited the participant to begin the task by opening the door to the adjacent BAT room.

Participants were encouraged to complete as much of the task as they felt comfortable, but were reminded that the task could be stopped at any point. If a participant hesitated in initiating the next step of the BAT, the experimenter prompted them to continue by saying "Please complete as much of the task as you are willing. The next step is . . ." If the participant indicated that he or she did not want to continue (or if the final BAT step was completed), the experimenter obtained a peak SUDS rating and guided the participant out of the testing room.

After completing the BAT, participants completed the brief post-experiment inquiry and were fully debriefed regarding the study hypotheses and the rationale for using deception. After debriefing, participants were given the option of having their data withdrawn. The study protocol was standardized to ensure that there were no systematic differences in the delivery of the protocol across experimenters. Four experimenters were trained in the study procedures as a group and served as mock participants during practice sessions of the protocol. All four of the experimenters were trained to perform both of the experimenter roles so that the characteristics of the experimenter were not confounded with the study conditions. Experimenter responses to possible statements made by participants during the task were specified so that deviations from the protocol script were spelled out verbatim. Periodic covert observation revealed that the detailed specification of the rationale and instructions was effective in ensuring consistency.

3. Results

3.1. *Tests of normalcy*

Preliminary analyses revealed that the BAT and FSQ had skewness values equal to or greater than .75. On the BAT, log and square root transformations were performed, resulting in a normal distribution. To ensure that this transformation did not impact the results, all the analyses that included the transformed BAT were also conducted with the original BAT variable. Both BAT variables resulted in the same statistical conclusions for all analyses. On the FSQ, a square root transformation was performed, resulting in a normal distribution. Indices of normality for all study variables pre- and post-transformations are shown in Table 1. Note that scores on the BAT were recoded such that higher scores indicating greater avoidance in order to ease interpretation and facilitate comparisons with other outcome variables.

Table 1. Means and standard deviations on all study measures by gender

Variable	Men (<i>n</i> = 50)			Women (<i>n</i> = 59)			<i>F</i>	<i>d</i>
	<i>M</i>	(<i>SD</i>)	Range	<i>M</i>	(<i>SD</i>)	Range		
BAT original ^a	11.50	(1.25)	7–12	10.07	(2.39)	1–12	14.55***	.075
Transformed	0.13	(0.29)	0.88–0.00	0.44	(0.39)	1.04–0.00	22.69***	.90
FSQ Original	39.20	(24.83)	18–108	61.49	(33.19)	18–126	15.30***	.76
Transformed	5.99	(1.83)	4.24–10.39	7.54	(2.17)	4.24–11.22	15.81***	.77
PAQ-F	22.80	(3.24)	14–30	24.34	(3.63)	15–31	5.36*	.45
PAQ-M	21.80	(4.10)	12–29	19.93	(3.61)	12–28	6.40*	.48
SUDS-A	27.83	(19.39)	0–75	39.66	(23.94)	0–100	7.85**	.54
SUDS-P	54.48	(24.96)	5–95	69.22	(21.38)	25–100	11.03**	.63

Note: ASE = anxiety-related self-efficacy total score; BAT = behavioral avoidance task total score; FSQ = fear of spiders questionnaire total score; PAQ-F = Personal Attributes Questionnaire–feminine subscale; PAQ-M = Personal Attributes Questionnaire–masculine subscale; SUDS-A = subjective units of distress scale–anticipatory rating; SUDSP = subjective units of distress scale–peak rating.

a. Original BAT represents the number of steps (0–12) completed.

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

3.2. Manipulation check

Random assignment yielded a group size of 56 participants in the irrelevant HR condition and 58 participants in the verifiable HR condition. Results of one-way analysis of variance (ANOVA) and chi-square tests conducted on all demographic and questionnaire measures indicated no significant differences across groups (all p 's $> .05$), indicating that random assignment generated groups that were equivalent at baseline.

Responses on the “participant feedback questionnaire” were examined to assess effectiveness of the experimental manipulation. All participants described the purpose of the heart rate monitor in a manner that indicated that they had accepted the rationale provided by the experimenter. These results suggest that the manipulation was successful in produced differential beliefs regarding the verifiability of SUDS ratings during the BAT.

3.3. Preliminary analyses

3.3.1. Gender effects

Preliminary analyses were conducted to determine if men and women differed with respect to demographic variables. Results from ANOVA and chi-square analyses revealed that there were no significant differences among men and women on any of the demographics assessed. As shown in Table 1, women scored significantly lower on the PAQ-M, $F(1, 107) = 6.40$, $p = .01$, $d = .48$, and significantly higher on the PAQ-F, $F(1, 107) = 5.36$, $p = .02$, $d = .45$, the SUDS-A, $F(1, 107) = 7.85$, $p = .01$, $d = .54$, and the SUDS-P, $F(1, 107) = 11.03$, $p = .01$, $d = .63$ compared to men. Women demonstrated significantly greater avoidance than men during the BAT, $F(1, 107) = 22.69$, $p = .00$, $d = .90$. See Figure 1.

Figure 1. Number of men and women terminating the BAT at each step.

3.3.2. Relationship among criterion variables

Correlation analyses were conducted to examine the relationships among the criterion measures. As shown in Tables 2 and 3, the SUDS-A was significantly correlated with the SUDS-P, indicating that greater anticipatory anxiety was associated with greater peak anxiety. Scores on the BAT were significantly correlated with the SUDS-A and the SUDS-P, indicating that higher levels of anticipatory anxiety and peak anxiety were related to greater avoidance during the BAT. The SUDS-P and the BAT were significantly more related with the SUDS-A and the BAT, $Z(109) = 1.91$, $p = .05$.

Table 2. Correlations between for all study measures

	FSQ	BAT	PAQ-F	PAQ-M	SUDS-A
FSQ	—				
BAT	.54***	—			
PAQ-F	.18	.13	—		
PAQ-M	-.16	-.25**	.04	—	
SUDS-A	.64***	.49***	.08	-.09	—
SUDS-P	.66***	.59***	.11	-.15	.75***

Note: FSQ = fear of spiders questionnaire total score; BAT = behavioral avoidance task total score; PAQ-F = Personal Attributes Questionnaire–feminine subscale; PAQM = Personal Attributes Questionnaire–masculine subscale; SUDS-A = subjective units of distress scale–anticipatory rating; SUDS-P = subjective units of distress scale–peak rating.

** $p < .01$; *** $p < .001$

Table 3. Correlation coefficients, regression weights, and Fisher's Z for comparing gender-related measures and all fear measures

	FSQ	SUDS-A	SUDS-P	BAT
Gender ^a	.36***	.26**	.31**	.42***
PAQ-F				
Entire sample	.18	.08	.11	.13
Men	.12	-.10	.09	.34*
Women	.08	.10	.02	-.13
Fisher's Z	.20	1.01	.36	2.45*
PAQ-M				
Entire sample	-.16	-.09	-.15	-.25**
Men	-.14	.01	-.03	-.21
Women	-.04	-.06	-.15	-.14
Fisher's Z	.51	.35	.61	.37

Note: FSQ = fear of spiders questionnaire; BAT = behavioral avoidance task total score; SUDS-A = subjective units of distress scale–anticipatory rating; PAQ-M= Personal Attributes Questionnaire–masculine subscale; PAQ-F = Personal Attributes Questionnaire–feminine subscale; SUDS-P = subjective units of distress scale–peak rating

a. Coded as men = 0 and women = 1

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

3.3.3. Relationship between anxiety-related variables and criterion variables

To examine the relationships between the criterion measures and the anxiety-related predictors, correlation analyses were computed among scores obtained on the BAT, the SUDS-A, the SUDS-P, and the FSQ. The FSQ was significantly positively correlated with the SUDS-A, the SUDS-P, and the BAT, indicating that greater spider fear was associated with greater subjective anxiety and avoidance during the task.

3.3.4. Relationship between gender-related variables and criterion variables

As shown in Table 3, the PAQ-F was not significantly related with any of the criterion measures. Among men, however, the PAQ-F was significantly related to the BAT, indicating that men with high expressivity displayed significantly greater avoidance than men with low expressivity. Contrary to hypothesis, the PAQ-M was not significantly related to the SUDS-A or the SUDS-P. The PAQ-M was, however, significantly negatively correlated with the BAT, indicating that individuals with high instrumentality were less likely to display avoidance during the BAT.

3.4. Hypothesis-driven analyses

3.4.1. Condition effects

Regression analyses were used to test the hypothesis that men would report greater subjective anxiety in the verifiable HR condition than in the irrelevant HR condition, but that differences in subjective anxiety would not be observed among women across conditions. Gender, condition, and their interaction were entered into a model predicting SUDS-A. This model was significant, $R^2 = .07$, $F(3, 105) = 2.79$, $p = .04$. Contrary to hypothesis 1, only

gender had a significant regression weight in this model, $b = 14.79$, $p = .02$, $pr = .24$, while neither condition, $b = 4.80$, $p = .45$, $pr = .07$, nor the interaction term, $b = -5.82$, $p = .50$, $pr = -.07$, significantly contributed to the model.

A second regression analysis examined interaction between gender and condition with regard to scores on the SUDS-P. This analysis also yielded a significant model, $R^2 = .11$, $F(3, 105) = 4.37$, $p = .01$; again, only gender had a significant regression weight in this model ($b = 18.93$, $p = .00$, $pr = .28$). As shown in Figure 2, the mean peak anxiety ratings among women appear similar across conditions whereas the mean rating among men appear greater in the verifiable HR condition than in the irrelevant HR condition. However, neither condition, $b = 9.26$, $p = .16$, $pr = .14$, nor the interaction, $b = -7.88$, $p = .38$, $pr = -.09$, were significant.

Figure 2. Mean peak anxiety ratings and 95% confidence intervals among men and women for each condition. **Note:** SUDS-P = subjective units of distress scale-peak rating.

A series of linear regression analyses was computed to test the hypothesis that individuals high in instrumentality would report greater subjective anxiety in the verifiable HR condition than in the irrelevant HR condition, but that levels of expressivity would relate similarly with subjective anxiety across conditions. The PAQ-M, condition, and their interaction were entered into two separate models for each criterion variable. Contrary to hypothesis 2, neither of these models were significant, SUDS-A: $R^2 = .01$, $F(3, 105) = .28$, $p = .83$; SUDS-P: $R^2 = .030$, $F(3, 105) = .98$, $p = .40$. Next, the PAQ-F, condition, and their interaction were entered into two separate models for each criterion variable. As hypothesized, these models were not significant, SUDS-A: $R^2 = .03$, $F(3, 105) = .91$, $p = .44$; SUDS-P: $R^2 = .03$, $F(3, 105) = .96$, $p = .41$.

Exploratory analyses examined the influence of condition and gender role on behavioral avoidance. Results paralleled the nonsignificant findings described above with one exception. A model that included the PAQ-M, condition, and their interaction was significant in predicting scores on the BAT among men, $R^2 = .16$, $F(3, 46) = 2.84$, $p = .05$. The significant

beta weight for the PAQ-M, $b = -.04$, $p = .01$, $pr = .39$, indicates that men with higher levels of instrumentality were less likely to avoid the spider. The significant beta weight for the interaction, $b = .05$, $p = .02$, $pr = -.34$, indicates that among men, the influence of instrumentality was less positive in the mock-verifiable condition (coded as 0) than the irrelevant HR condition (coded as 1). Thus, men with high instrumentality displayed greater avoidance in the verifiable HR condition than in the irrelevant HR condition, whereas expressiveness related similarly with avoidance across conditions.

3.4.2. Gender-related predictors of fear and avoidance

Separate linear regression analyses were used to test the hypothesis that gender, instrumentality, and expressiveness would each independently predict self-reported spider fear, subjective anxiety, and behavioral avoidance. As predicted in hypothesis 3, gender was significantly related with each of the criterion measures, regardless of experimental condition. The PAQ-F was related to the FSQ at a trend level, $R^2 = .03$, $F(1, 107) = 3.72$, $b = .12$, $p = .06$. However, once gender was included in the model, the PAQ-F was clearly unrelated ($b = .07$, $p = .24$, $pr = .12$), indicating that although there was a trend for expressivity to predict fear of spiders, the portion of variance accounted for was not significant when gender was included as a predictor. Within-gender analyses revealed that the PAQ-F was significantly related to the BAT among men, $b = -.03$, $p = .02$, indicating that men with high expressivity displayed greater avoidance than men with low expressivity. Contrary to hypothesis 3, scores on the PAQ-M were not related to scores on the FSQ. See Table 3.

Neither the PAQ-M nor the PAQ-F was significantly related to scores on the SUDS-A or the SUDS-P. Thus, the hypothesis that instrumentality and expressivity would predict subjective anxiety was not supported. Given this lack of significant association, combined models that included gender were not examined. The hypothesis that instrumentality and expressiveness would account for a greater proportion of the variance than gender alone was not supported.

Consistent with hypothesis 3, the PAQ-M was significantly related to the BAT, indicating that higher instrumentality was associated with greater avoidance behavior. The relationship between instrumentality and avoidance was no longer significant when controlling for the influence of gender, $b = -.02$, $p = .09$, $pr = .16$. Thus, although greater instrumentality was related to avoidance within a single-predictor model, the portion of variance accounted for was no longer significant when controlling for gender.

4. Discussion

Anxiety research has thrived in recent years and continues to move forward at a robust pace, but our understanding of well-established gender effects has lagged behind. The present study attempted to address this by examining the relationship between gender role and fear, as well as the influence of reporting biases on this relationship.

4.1. Manipulation of perceived verifiability of self-report

Pierce and Kirkpatrick (1992) found that gender differences in reported fear decreased under experimental conditions that encouraged truthful responding. We attempted to replicate

these findings in amore ecologically valid experimental task, but contrary to our hypothesis, neither condition nor the interaction between gender and condition was significantly related to subjective anxiety ratings. Furthermore, neither condition nor the interaction between each gender role and condition was significantly related to subjective anxiety ratings among the entire sample.

Lack of a condition effect could have resulted either because men provided equally honest responses in both conditions or because the experimental manipulation failed to elicit more accurate responding from men. Although the rationale for the heart rate monitor differed across experimental conditions, it was enveloped within a fairly long set of instructions, perhaps reducing the manipulation's saliency. The lack of condition effect may also be attributable, in part, to the reactivity of wearing the heart rate monitor even in the irrelevant HR condition. Alternately, it is possible that the current sample size of 109 participants was not large enough to find an effect using a between-groups design. Indeed, post hoc power analyses revealed that the probability of having made a type II error was approximately 80%. Thus, it is possible that the between-subjects design, standardization of equipment use across conditions, and the sample size of the present study obscured significant condition effects.

No a priori predictions were made regarding how the interaction between condition and gender role would relate with behavioral avoidance. However, exploratory analyses showed that men with high instrumentality were more avoidant in the verifiable HR condition than the irrelevant HR condition, whereas expressiveness related similarly with avoidance across conditions. One explanation for this effect is that in the verifiable heart rate condition, men with high instrumentality were less inclined to persevere because they felt that completing the task would increase their anxiety to a level that they did not want to verbally report in their fear ratings. Men high in instrumentality may have been more willing to persevere when they knew that their subjective anxiety would not be verified.

4.2. The relationship between gender role and avoidance

The present study aimed to replicate and extend the findings of Gallacher and Klieger (1995) using a more challenging BAT modeled after the task developed by Woody et al. (2005). When used previously, this BAT produced an avoidance rate of 54% (i.e., 46% completed the entire BAT). Despite increasing difficulty of the task by including an additional step, a smaller proportion of our participants (40.4% of the entire sample, 59.3% of women, 18% of men) demonstrated at least some avoidance. Thus, the BAT used in the present study demonstrated a ceiling effect similar to the one reported by Gallacher and Klieger (1995). Nonetheless, gender was significantly related to fear of spiders, anticipatory anxiety, peak anxiety, and behavioral avoidance as expected, with women demonstrating greater levels of fear and avoidance than men on all criteria.

Consistent with hypotheses and theories of gender role socialization and anxiety (see Barlow, 1988; Craske, 1999), higher levels of instrumentality among men and women were associated with decreased behavioral avoidance. We also found a significant relationship between expressivity and behavioral avoidance but only among men. The finding that men with higher expressivity were more avoidant is especially notable in light of the BAT ceiling effect and the overall low avoidance scores among men. This suggests that although

the male participants demonstrated very little avoidance overall, those with high expressivity were more willing to terminate the BAT early. To the degree that the PAQ-F scale taps emotional openness, men with high expressivity may have been behaving more concordantly with their subjective experience. Yet, if this hypothesis were true, we would expect men high in expressivity to also report greater anxiety. The lack of relationship between gender role and subjective anxiety suggests that expressivity affects men's behavior but not their subjective anxiety. This could be because men high in expressivity were more comfortable terminating the task before their subjective anxiety rose to a distressing level; they might have not persevered in the task long enough to experience higher levels of subjective anxiety. If the experimental demands had required men to complete the BAT, then there may have been a significant effect for expressivity on subjective anxiety.

Despite the observed relationship between gender role and behavioral avoidance, the PAQ-M and the PAQ-F were less consistently related with other anxiety criteria. Contrary to expectation, neither instrumentality nor expressivity was significantly related with anticipatory or peak anxiety ratings. Although there was a trend for the PAQ-F to relate with the FSQ, neither gender role was significantly related to fear of spiders. This finding is contrary to several previous investigations showing a significant relationship between gender role and fear (Arrindell et al., 1993; Brehony, 1983; Carey et al., 1988; Carsrud & Carsrud, 1979; Dillon et al., 1985; Tucker & Bond, 1997), the large majority of which used similar measures. Although there is some variability as to which gender role is most closely related to self-reported fears, there is little disagreement in the literature that gender role is associated, in some capacity, with fear reporting.

In this study, we asked participants to provide their anxiety ratings confidentially on a piece of paper rather than report the ratings verbally in order to reduce demand characteristics. However, because gender role differences may be most evident in situations with implicit gender role expectations and high social demand, the use of confidential ratings may have had the unanticipated effect of tempering gender role differences. Although speculative, this may explain why gender role differences were evident on observable measure (behavioral avoidance), but not on the self-report measures (FSQ, SUDS-A, SUDS-P). Gender roles may be more strongly related to measures with higher demand characteristics, such as observer-rated criteria. This hypothesis would not, however, explain the lack of relationship observed between the gender roles and self-reported spider fear.

4.3. Limitations and future directions

There are several limitations in this study that warrant discussion. First, it is possible that we had insufficient power to detect condition effects, and/or that experimental instructions were insufficiently emphasized. To replicate the reporting bias demonstrated by Pierce and Kirkpatrick (1992), further research should increase sample size or utilize a within-participants design. Second, the generalizability of our findings is limited by the use of a non-clinical sample, which was fairly restricted in age and ethnicity. Future research will need to examine how gender roles are related to anxiety symptoms among diverse samples and clinical populations. Third, although fear behavior was examined in vivo, this study relied on self-report measures in assessing other key constructs, enhancing the possibility that participants were less than accurate for any number of reasons. This may be especially

likely for measures with high face-validity and content that could elicit reactivity among respondents. To the degree that participants perceived the PAQ items as reflecting gender stereotypes, their responses may have been biased. It is also important to note that, although not markedly inconsistent with previous research, the internal consistency for the PAQ in the present study (PAQ-F: $\alpha = .66$; PAQ-M: $\alpha = .68$) was lower than expected. It may be that gender roles among men and women have become more similar in recent years, and that the lack of gender effects on the PAQ simply reflects this sociocultural change. Although the results of the present study are generally consistent with this notion, the evidence from recent research that men and women differ on measures of gender role is difficult to reconcile with findings in the present study.

A final limitation of relates to the artificiality and demand characteristics of the experimental situation. Although the ceiling effect was unexpected in light of previous research (e.g., Woody et al., 2005), it is possible that it was a function of the experimenter observation and verbal prompting, rather than the difficulty of the task. Future research should include behavioral measures of fear that are both challenging and as unobtrusive as possible.

4.4. Conclusions

In spite of a ceiling effect observed on the BAT, this study found that high levels of instrumentality were associated with greater behavioral approach to a spider. In contrast, high levels of expressivity were significantly related to greater behavioral avoidance but only among men. Contrary to expectation, neither instrumentality nor expressivity was significantly related with anticipatory or peak anxiety ratings suggesting that gender role may be more related to fear behavior than fear reporting. Alternately, methodological issues such as restricting the operational definition of gender role to gender-related personality characteristics may have limited the results.

Evidence that men underreport fear compared to women (see Pierce & Kirkpatrick, 1992) and that gender role differences underlie this finding was not replicated in the present study. Importantly, this study is the first to assess the influence of gender role on potential reporting biases in fear and anxiety. As such, the findings require replication using a stronger experimental manipulation or within-participants design.

Neither gender role subscale was more predictive of the criteria than gender itself and we propose two primary interpretations of this finding, which are not mutually exclusive. First, it may be that men and women differ in other vulnerability factors for anxiety disorders that have yet to be identified. Second, it may be that our ability to conceptualize and measure the influence of gender socialization remains insufficient. Further theoretical and empirical work clarifying the nature of gender roles may be necessary before their influence on fear and anxiety or other gender-related phenomena can be meaningfully assessed. Alternately, future research may need to focus on broadening the operational definition of gender role to include multiple measures that cover diverse aspects of masculinity and femininity.

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Note

1. We use the term gender, meaning the behaviors, attitudes, and personality traits associated with men and women within a particular context, rather than sex, which refers exclusively to biological processes (Deaux, 1985), except in cases where measures of gender role are included to control for the sociocultural and psychological processes inherent to the construct of gender.

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