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Gender Differences in Overt Behavior and Mediators of Depression Severity

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To the Graduate Council:

I am submitting herewith a thesis written by Marlana Maria Ryba entitled "Gender Differences in Overt Behavior and Mediators of Depression Severity." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

Derek R. Hopko, Major Professor

We have read this thesis and recommend its acceptance:

Paula Fite, Michael Olson

Accepted for the Council:

Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

To the Graduate Council:

I am submitting herewith a thesis written by Marlena Ryba entitled, "Gender Differences in Overt Behavior and Mediators of Depression Severity as Assessed through Daily Diary Monitoring." I have examined the final paper copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

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We have read this thesis and recommend its acceptance:

Paula Fite, Ph.D.

Michael Olson, Ph.D.

Accepted for the Council

Carolyn R. Hodges
Vice Provost and Dean of the Graduate School

**Gender Differences in Overt Behavior and Mediators of Depression Severity
as Assessed through Daily Diary Monitoring**

A Thesis Presented for the

Master of Arts

Degree

The University of Tennessee, Knoxville

Marlena Maria Ryba

August 2011

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Abstract

For several decades, evolutionary and social learning theories have been explanatory frameworks to explicate gender differences in overt behaviors and the prevalence, etiology, and maintenance of mental health problems. To further explore relations among gender, overt behaviors, and depression severity, this study used a daily diary methodology to examine gender differences within thirteen behavioral domains and whether differential frequency of overt behaviors and environmental reward mediated the relationship between gender and depression severity. Overall, females engaged in a significantly greater breadth of behavioral domains and reported a higher level of environmental reward. Females reported spending more time in the domains of health/hygiene, spiritual activities, and eating with others. In contrast, males spent a greater duration of time in the domains of physical activity, sexual activity, and hobbies and recreational experiences. In relation to males, females found social activities, passive/sedentary behaviors, eating with others, and engagement in “other” activities to be more rewarding. Gender had a significant direct effect on depression severity, with females reporting increased depression. This effect was attenuated by the mediator (total environmental reward) such that to the extent that females exhibited increased environmental reward, the gender effect on depression was reduced. These data support behavioral models of depression and have clinical relevance as highlighted in the context of behavioral activation interventions for depression.

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The exploration of behavioral gender differences has a lengthy history whereby males and females have been found to differ in several domains, including verbal, visual-spatial, and mathematical abilities, emotional expression, verbal and non-verbal communication, relationship styles, sexual behavior, exercise, self-esteem, and body image, and the propensity to behave aggressively and commit violent crimes (Archer, 2000; Brannon, 1999; Bennett, Farrington, & Huesmann, 2005; Fischer, 1993; Furnham, Badmin, & Sneade, 2002; Maccoby & Jacklin, 1974; Oliver and Hyde, 1993; Peterson & Hyde, 2010; Stewart et al., 2002). In attempting to explain such gender differences, evolutionary theorists posit that their emergence is due to gender-specific adaptive mechanisms in which males and females engage in activities that increase the likelihood of survival and ability to reproduce (Archer, 1996; Buss, 1995; Daly & Wilson, 1983, Kenrick & Keefe, 1992; Tooby & Cosmides, 1992). For example, male's visual-spatial advantages may have evolved from early hunting experiences (Buss, 1995), and aggression, competitiveness to find a partner to procreate, and promiscuity increased chances of reproduction and generational transmission of genes. Conversely, because females generally invest substantial time and energy in raising offspring, they may be more selective in choosing their partner and seek a mate that will provide for their children and maximize their chance of survival. Therefore, whereas females may be attracted to males with more resources, males might be more inclined to pursue feminine youth that would increase likelihood of sexual reproduction. Supporting this theory, cross-cultural studies demonstrated that males emphasized youth and beauty as critical partner qualities and females showed preferences for males with high earning potential, ambition, and industriousness (Buss & Schmitt, 1993; Feingold, 1990).

From a social learning model, gender differences are a function of parental childrearing practices, social reinforcement and punishment, modeling and vicarious conditioning, societal gender role expectations, self- and peer-socialization, and sex segregation (Lippa, 2005; Whiting & Edwards, 1988). For example, infant gender effects parental interactions, with parents handling infant boys more aggressively and parents smiling and speaking to infant girls more frequently (Leaper, Anderson & Saunders, 1998; Lewis & Weinraub, 1979). According to social role theory, males and females exhibit different roles in social situations due to societal expectations and gender stereotyping. This includes females being more passive, cooperative, and compliant, engaging in more domestic tasks, and having differential occupational roles and occupational status (Eagly, 1987; Eagly, Wood, & Deikman, 2000; Merton, 1968). Social role theory asserts that these roles and other dispositions and behaviors are a direct function of social learning. Although evolutionary and social theories are used as explanatory frameworks for explicating behavioral gender differences, they are not always considered mutually exclusive. For example, Harris's (1995) biosocial model and Archer's (1996) co-evolutionary theory do not view the process of social learning as independent of innate dispositions, but rather highlight biological, cultural, and social influences as integrative factors that collectively influence the development and maintenance of gender differences.

Gender and Mental Health

Gender differences are apparent in the prevalence and expression of certain mental health problems. In relation to males, females are more likely to present with internalizing disorders such as depression and anxiety (American Psychiatric Association, 2001; Barlow, 2002; Nolen-Hoeksema, 2001), whereas men have a higher prevalence of externalizing disorders, including

antisocial personality disorder and substance abuse (Brady & Randall, 1999; Mineka, Watson, & Clark, 1998; Rosenfield, 2000). As an example of the many factors contributing to mental health gender differences, consider the widely established finding that depression is more common among females (21%) than males (13%; Kessler et al., 2003). Biological factors such as genetics, hormones, adrenal functioning, and neurotransmitter systems, as well as psychosocial influences including more aversive childhood experiences, gender roles (competing social roles, role limitation, or role overload), increased vulnerability to emotional pain of others, and differential attributions related to life experiences contribute to this discrepancy (Kessler & McLeod, 1984; Nolen-Hoeksema & Hilt, 2009; Piccinelli & Wilkinson, 2000; Radloff, 1975). Females also are more likely to ruminate, exacerbating their level of distress in response to stressful, sad, or unpleasant experiences (Nolen-Hoeksema et al., 1994). Gender role theorists also posit that female gender roles may be more distressing, more routine, and less satisfying than male's, possibly rendering females more susceptible to depression (Gove, 1972; Roxburgh, 1996; Simon, 1997). Integrating biological perspectives, females may be more affected by hormonal and genetic factors (Bierut et al., 1999), and may be more vulnerable to depression due to menstruation and postpartum experiences (Freeman et al., 2004; Seeman, 1997; Steiner, Dunn, & Born, 2003).

To further emphasize the complexities inherent in conceptualizing gender differences in mental health, consider that anxiety disorders are highly coexistent with depression and are also more prevalent among females (Kessler et al., 1994). Numerous studies have shown that adopting stereotypical gender roles can increase the likelihood of becoming anxious, which also may ultimately contribute to the onset of a depressive episode (Breslau, Schultz, & Peterson,

1995; Lewinsohn, Rohde, & Seeley, 1998; Stewart, Taylor, & Baker, 1997). For example, by virtue of social learning, females may be conditioned to become more fearful (Fodor, 1974; Fischer 1993) while male gender roles and behavioral correlates may serve a preventative function for anxiety (Chambless & Mason, 1986) due to characteristics such as courage and assertiveness that may allow for more exposure to aversive or threatening stimuli and thus reduce anxiety-related responding (Shear, Feske, & Greeno, 2000). The higher frequency of negative life events experienced by females may also contribute to increased anxiety and depression prevalence (Bebbington, Tennant, & Hurry, 1991; Cyranowski et al., 2000; Ge, Lorenz, Conger, Elder, & Simons, 1994; Piccinelli & Wilkinson, 2000).

When examining the relation between gender and mental health problems such as depression, understanding overt behavioral patterns may allow further insight into the etiology and maintenance of depression and have important assessment and treatment implications (Hopko, Armento, Bare, & Hunt, 2004). For example, relative to non-depressed individuals, depressed individuals generally report participating in fewer rewarding and pleasurable activities (Hopko, Armento, Cantu, & Chambers, 2003; Lewinsohn and Libet, 1972; MacPhillamy & Lewinsohn, 1974) and engage in fewer social, physical, and educational behaviors (Hopko & Mullane, 2008). Depressed individuals generally exhibit a slower and more monotonous rate of speech, take longer to respond to the verbal behavior of others, exhibit an increased frequency of self-focused negative remarks, and use fewer “achievement” and “power” words in their speech (Gotlib & Robinson, 1982; Libet & Lewinsohn, 1973). Depressed and non-depressed individuals also differ in their non-verbal behavior. Depressed individuals smile less frequently, make less eye contact, more frequently hold their head in a downward position, and are rated as less

competent in social situations (Gotlib & Robinson, 1982; Ranelli & Miller, 1981; Dykman, Horowitz, Abramson, & Usher, 1991).

Given such empirical findings, continued systemic research is necessary to better highlight potential gender differences in various behavioral domains as well as whether these differences facilitate a deeper understanding of gender differences in depression. If males and females differ in the frequency and possibly reward derived from certain overt behaviors, it is conceivable that these differences could contribute to the development and maintenance of psychological problems such as depression (Lewinsohn, 1974). In such cases, it would be feasible to proactively recommend healthy behavioral repertoires and modify treatment interventions to more adequately address psychological distress while taking gender into account. As an important step in this process, it is necessary to more validly assess potential gender differences in the context of major life domains (Hayes, Strosahl, & Wilson, 1999).

The primary aim of this study was to evaluate differences between males and females in activities assessed via self-monitoring through daily diaries. Relative to self-report strategies that retrospectively assess overt behaviors, a more ecologically valid method of determining the frequency of behaviors may be through use of such daily diaries (Hopko, Armento et al., 2003). Studies incorporating daily diaries have found daily ratings of behaviors and depression symptoms to correlate strongly with self-report and clinician-rated measures of depression (Freeman, DeRubeis, & Rickels, 1996; Hopko, Armento et al., 2003; Hopko & Mullane, 2008; Robbins & Tanck, 1984; Stamenkovic et al., 2001). Similar daily diary designs have demonstrated adequate internal consistency and good convergent and discriminate validity in research on anxiety (Beidel, 1996; Nelson & Clum, 2002) and other symptom presentations (Ely,

Dampier, Gilday, O'Neal, & Brodecki, 2002; Grant, Long, & Willms, 2002; van den Brink, Bandell, & Huijer, 2001; Okami, 2002; Watson, 1999). Using this methodology as a novel approach to exploring behavioral gender differences, it was hypothesized that females would engage in more passive and sedentary behaviors, while males would engage in more physical and active behaviors as evolutionary theory and social learning models would suggest. Further, it was hypothesized that males and females would find these specific activities more rewarding as indicated through social learning theory. In addition to speculating that these behavioral gender differences would emerge, it was hypothesized that decreased engagement in non-depressive healthy behaviors and diminished environmental reward would significantly mediate the relationship between gender and depression severity (Carvalho & Hopko, 2011).

Method

Participants

Participants included 82 undergraduate students [(females: $n=54$; males: $n=28$)] from an introductory psychology class at a large southeastern university. The entire sample consisted of 69 Caucasians (84.1%), 8 African Americans (8.5%), and 6 (7.3%) participants who self-identified as Asian American. The mean age of participants was 20.2 years ($SD=3.9$ years). All participants received course-related research credit for their participation in the study and the research was approved by the University of Tennessee Institutional Review Board.

Assessment measures

Participants completed the Beck Depression Inventory-II (BDI-II; Beck et al., 1996), a 21-item measure of depression symptom severity, each of which is rated on a 4-point Likert scale (0-3 point anchors), with items summed to form a total score. The instrument has excellent

internal consistency ($\alpha = .92$) as well as strong convergent validity with other measures of depression (Beck et al., 1996; Nezu, Ronan, Meadows, & McClure, 2000). Internal consistency in this sample was excellent ($\alpha = .93$). For the current sample (BDI-II: $M = 11.7$, $SD = 7.8$), females reported increased depressive symptoms ($M = 13.0$, $SD = 8.0$) relative to male participants ($M = 9.3$, $SD = 7.1$) [$t(80) = 2.11$, $p < .05$].

Procedure

Participants met with an experimenter on two occasions. During the first meeting, participants first completed the BDI-II and a demographic form. Participants were then given a packet that included seven daily activity-monitoring forms and detailed instructions. Participants were instructed to record all of their behaviors and activities for the following week. These daily forms contained space for participants to record their behavioral data from 8 A.M to 2 A.M, within half-hour intervals. Participants were also encouraged to be as honest as possible and to record their behaviors every couple of hours to help them accurately recall their behaviors. They were then asked to code each behavioral activity according to *one* of the following categories:

- (1) Social: time with friends, family, boyfriend or girlfriend, etc.
- (2) Physical: hiking, biking, walking to class, any other exercise, etc.
- (3) Health/hygiene: showering, bathing, brushing teeth, being at the doctor or dentist, etc.
- (4) Spiritual: attending church, engaging in prayer/ meditation, reading religious text, etc.
- (5) Educational: classes, homework, lectures, computer work, etc.
- (6) Passivity/sedentary: napping, sitting, watching television, Internet surfing for fun, etc.
- (7) Sexual: intimate physical acts, intercourse, masturbation, etc.
- (8) Employment/volunteering: working at your job, babysitting, helping the elderly, etc.

(9) Hobbies and recreation: reading, drawing, writing, scrapbooking, playing music, etc.

(10) Eating alone: snacking, meals, etc.

(11) Eating with others: snacking, meals, etc.

(12) Travel: commuting to school, home, work, flying, traveling to foreign countries, etc.

(13) Other: any behavior not coded in domains 1–12.

Additionally, participants were instructed to engage in their normal routines and to not alter their behaviors for the purpose of this study. For each behavior participants listed on their daily activity-monitoring forms, participants indicated the degree to which they found the activity to be rewarding [on a 1 (minimally rewarding) to 4 (highly rewarding) Likert scale]. Finally, participants were provided with an explanation as to what constituted overt behavior and were asked *not* to record specific thoughts, physiological responses, feelings, and emotional experiences. Participants returned approximately 1 week later (pending participant and experimenter availability), returned their daily diaries and completed a post-assessment BDI-II.

Results

The total duration of time (hours per week) spent in each activity domain was calculated for each participant and is presented in Table 1. For the entire sample ($n = 82$), the most commonly reported behaviors were as follows, presented in descending order based on the percentage of time activities were engaged in during the monitoring week: Educational (26%), Passivity/sedentary (25%), Social (13%), Eating with others (6%), Employment/volunteering (6%), Travel (5%), Health/hygiene (4%), Hobbies and recreation (4%), Physical (3%), Other (3%), Eating alone (3%), Spiritual (1%), Sexual (1%), and “other” (<1%). Independent-samples t-tests were used to examine whether the mean duration of time in each activity domain

statistically differed as a function of gender. Estimated Cohen's d is presented as a measure of effect size ($d = 0.20 = \text{small}$; $d = 0.50 = \text{medium}$; $d = 0.80 = \text{large}$). As indicated in Table 1, on a more global level, females engaged in a significantly greater number of behavioral domains and reported a higher level of overall environmental reward relative to males. On a more specific level of analysis, females reported spending a greater duration of time in the behavioral domains of health/hygiene, spiritual activities, and eating with other individuals. In contrast, males reported spending a greater duration of time in the behavioral domains of physical activity, sexual activity, and hobbies and recreational experiences. Males and females did not differ in the duration of time spent in the following behavioral domains: social, educational, passive/sedentary, employment, travel, time spent eating alone, or engagement in "other" activities. Also presented in Table 1, the average reward value recorded on the daily diaries for each behavioral domain was compared as a function of gender. In relation to males, females found social activities, passive/sedentary behaviors, eating with others, and engagement in "other" activities to be more rewarding. There were no group differences in reward ratings in the behavioral domains of eating alone, physical activity, health/hygiene, spiritual, educational, sexual, employment, recreation/hobbies, or travel activities.

Mediation Analyses

Mediation analyses (e.g., tests of indirect effects) were conducted using a bootstrapping method (Preacher & Hayes, 2008), which has a lower Type II error rate and greater statistical power than the traditionally used causal steps approach advocated by Baron and Kenny (1986) (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004, 2008; Shrout & Bolger, 2002). Bootstrapping techniques were performed in line with recommendations

by Preacher & Hayes (2008), with $k = 5,000$ re-samples and 95% bias-corrected and accelerated (BCa) confidence intervals (CI) used to evaluate indirect effects. BCa confidence intervals include corrections for median bias and skew (Efron & Tibshirani, 1993). The use of 95% confidence intervals is equivalent to testing for significance at the .05 level. The confidence interval estimates are reflective of the 5000 resamples and the point estimates indicate best estimations of single sample population parameters. Mediation was considered to have occurred if the 95% BCa confidence intervals generated by the bootstrapping method did not contain zero. Mediation analyses were conducted only for those behavioral domains and reward values that were identified as differing as a function of gender. For all mediation analyses, gender was the independent variable and depression severity (BDI-II) was the dependent variable. Consistent with prior studies (Carvalho & Hopko, 2011; Hopko, Armento et al., 2003; Hopko & Mullane, 2008) depression severity was based on the average BDI-II score from both administrations. This strategy was used to obtain a more accurate index of psychological functioning during the one week assessment period as opposed to using either the time 1 or time 2 administration. As presented in Table 2, daily diary-measured total overall reward significantly mediated the relationship between gender and depression severity. In terms of other diary-based variables identified as differing as a function of gender, time spent in hobbies and recreational activities and reward value of “other” activities also mediated the relationship between gender and depression severity.

Discussion

In the last several decades, substantial research has explored gender differences on a wide range of abilities and behaviors and the potential implications of these differences on a number

of outcome variables, including but not limited to academic performance, occupational status, and mental health functioning. The current investigation expanded on these objectives by utilizing a daily diary monitoring methodology to examine gender differences on thirteen primary life domains that are considered fairly comprehensive insofar as capturing major categories of overt human behaviors (Hayes et al., 1999). In contrast to past research, behavioral gender differences were identified using a more direct and naturalistic assessment method (Cone, 1978) that extended beyond retrospective behavioral accounts, minimized experimental demand characteristics, and did not rely on experimental manipulations to infer relationships between variables. The study also was novel in the aim of addressing how gender differences in overt behavior might mediate the well-established relation between female gender and increased depression prevalence (APA, 2001; Kessler et al., 2003). Consistent with evolutionary and social learning theories of behavioral gender differences, results supported the notion that males and females differ in the duration of time engaged in particular behavioral domains as well as reward experienced in different domains. As predicted, males engaged in more active behaviors for significantly longer time durations, including physical, sexual, and recreational based activities. In contrast, females spent more time engaged in social activities such as spiritual and religious behaviors as well as dining with others. As indicated by increased duration of time in health and hygiene based activities, females also generally appeared more concerned with physical appearance. Also consistent with hypotheses, females reported social behaviors (including eating with others) as well as passive and sedentary activities to be more rewarding.

Contrary to the matching law and social learning theory of gender roles (McDowell, 1982), all high frequency behaviors were not necessarily endorsed as more rewarding.

Furthermore, males did not report greater derived reward in any behavioral domain relative to females. One explanation for these findings involves possible gender differences in terms of reactivity to self monitoring (Kanfer, 1977; Nelson & Hayes, 1981). Second, it is conceivable that the perceived level of reward derived from engaging in particular behaviors is less operational for males than females, with the former gender potentially requiring less salient or potent reinforcement schedules to maintain overt behaviors. Third, the findings of this study support previous research indicating that females are more communal in nature (Suh, Moskowitz, Fournier, & Zuroff, 2004). It was found that women spent more time eating with others and engaging in health/hygiene and spiritual behaviors. While eating with others is clearly a communal activity, it is feasible that health/ hygiene and spiritual behaviors serve as behaviors that increase the likelihood of future communal and rewarding behaviors.

Interestingly, collapsed across all behavioral domains, females reported increased overall reward associated with overt behaviors as well as participation in a significantly greater breadth of behavioral domains. Intriguingly, and contrary to behavioral theory and research supporting the link between increased environmental reward and reduced depressive affect (Carvalho & Hopko, 2011; Ferster, 1953; Hopko, Armento et al., 2003; Lewinsohn, 1974), females also reported increased depression severity on the BDI-II. To address this apparent anomaly, reference to mediational analyses is necessary. Specifically, although gender was found to have a direct effect on depression severity, this effect was attenuated by the mediator (total environmental reward) such that to the extent that females exhibited increased self-reported environmental reward, the gender effect on depression was reduced. This finding is entirely consistent with behavioral models of depression (Ferster, 1953; Hopko, Lejuez, Ruggiero, &

Eifert, 2003; Lewinsohn et al., 1974; Manos, Kanter, & Busch, 2010) and supports conceptual foundations of behavioral activation treatment interventions designed to increase exposure to environmental reward and response-contingent positive reinforcement (Cuijpers, van Straten, & Warmerdam, 2007; Ekers et al., 2008; Sturmey, 2009). Moreover, these data suggest that at least one plausible mechanism to address gender differences in depression may be through concerted efforts to increase environmental reward and reinforcement in depressed females. Indeed, in a recently conducted randomized controlled trial examining the efficacy of behavioral activation for depressed women with breast cancer, the intervention reduced depression significantly, was associated with strong effect sizes, and treatment gains were maintained through 12-month follow-up (Hopko, Armento, Robertson, et al., 2011). Also noteworthy, the significant mediational effect of hobbies and recreational activities suggests that increased engagement in this behavioral domain may serve a potential buffering effect toward attenuating depressive symptoms. Whether specifically targeting this behavioral domain among females with increased depression severity would be an effective behavioral intervention is an empirical question worthy of investigation.

Although study findings are highly provocative, several limitations are noteworthy. First, behavioral contingencies are experienced on a continuous basis. Accordingly, although perhaps an advancement, even the present methodology of monitoring activities in half-hour intervals does not allow measurement of the entire spectrum of overt behaviors and operant relations. Second, functional qualities of behaviors and the frequency of punished behaviors as a function of gender were not explored in the current study (Ferster, 1953, Lewinsohn, 1974). This limitation is significant given the importance of functional relationships and environmental

suppressors in conceptualizing the development and persistence of depression (Carvalho, Gawrysiak, Hellmuth et al., 2011). Third, although participants reported compliance with monitoring procedures when queried post-experimentally, we cannot be certain as to whether diaries were completed at reliable and regular intervals. Indeed, this limitation is inherent in a majority of studies that incorporate diary methods. Future studies can increase participant compliance with the use of Internet-based assessment or palm pilots (Shiffman et al., 2002). Fourth, it is possible that unmeasured variables may account for unique variance in behaviors that in the present study were attributable to gender difference. For example, an assessment of masculinity and femininity (perhaps using the MMPI-2) would help determine the incremental validity of one's gender as a predictor of frequency and reward value of social behavior. Fifth, reward ratings and their association with negative affect were not assessed as a function of temporal factors. Accordingly, although a behavior may initially be perceived as rewarding, delayed negative consequences might occur that could subsequently affect self-reported reward and negatively impact mood. Longitudinal work is necessary to address this issue. Sixth, attention to private behaviors was not undertaken in this study, and therefore the presence of potential gender differences in covert behaviors cannot be addressed. Finally, some measurement error might have been associated with behavioral coding strategies. As the study required participants to code their activities, and although they received instruction on this process, they did not receive extensive guidance or training, which may have resulted in problems with inter-rater reliability and decreased study power.

In closing, study findings are supportive of evolutionary and social learning theories of gender. Given that some research suggests that gender differences have diminished over time as

societal norms have changed and gender roles have become more egalitarian, the findings found in this study are striking (Twenge, 1997). Indeed, it is conceivable that one could predict a magnification of already large effect sizes with inclusion of individuals who rate themselves as highly feminine or masculine on gender identity scales. Furthermore, it might be predicted that depression would be most severe among individuals with high femininity ratings and low levels of environmental reward. This would provide additional support and utility for behavioral activation interventions among depressed individuals, in particular females. Further systematic research in these areas will be critical toward continued refinement of behavioral interventions and conceptualizing the role of gender differences as they pertain to emotional health problems such as depression.

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Appendix

Table 1

Time Duration and Reward Value of Overt Behaviors as a Function of Gender

Behavioral domain	Male		Female		<i>t</i>	<i>p</i>	<i>d</i>
	Mean	SD	Mean	SD			
Total Domains Engaged	9.5	1.5	10.1	1.3	2.04	<0.05	
Total Average Reward	2.6	0.6	2.9	0.4	2.13	<0.05	0.59
Social	28.5	24.6	35.4	16.4	1.51	0.13	
Social reward	3.2	0.6	3.6	0.3	3.20	<0.01	0.84
Physical	12.2	15.8	6.8	7.7	2.04	<0.05	0.43
Physical reward	2.9	1.0	3.0	0.8	0.14	0.89	
Health/Hygiene	6.2	5.4	11.5	5.6	4.10	<0.01	0.96
Health/Hygiene reward	2.6	0.8	2.6	0.7	0.19	0.85	
Spiritual	1.3	3.0	4.3	6.6	2.30	<0.05	0.59
Spiritual reward	2.9	0.9	3.5	0.8	1.48	0.15	
Educational	62.7	22.0	67.6	21.1	0.98	0.33	
Educational reward	1.8	0.6	1.9	0.6	0.65	0.52	
Passivity/Sedentary	68.0	21.9	61.8	20.0	1.30	0.20	
Passivity/Sedentary reward	3.1	0.7	3.4	0.6	2.00	<0.05	0.46
Sexual	2.3	4.7	0.8	2.3	2.02	<0.05	0.41
Sexual reward	3.7	0.6	3.7	0.4	0.15	0.88	
Employment	16.6	25.0	14.0	18.9	0.53	0.60	
Employment reward	2.4	0.8	2.7	0.8	0.89	0.38	
Hobbies/recreation	15.6	26.0	6.3	8.5	2.40	<0.05	0.51
Hobbies/recreation reward	3.2	0.6	3.4	0.5	1.23	0.23	
Eating alone	6.8	4.7	6.2	6.3	0.44	0.66	
Eating alone reward	2.7	0.7	2.7	0.8	0.19	0.85	
Eating with others	11.9	8.5	16.4	10.0	2.04	<0.05	0.48
Eating with others reward	3.1	0.7	3.5	0.5	2.81	<0.01	0.66
Travel	13.8	11.8	11.9	12.9	0.65	0.52	
Travel reward	2.0	0.7	2.1	0.8	0.11	0.91	
Other	5.4	7.7	8.8	8.4	1.77	0.08	
Other reward	1.8	0.7	2.4	0.8	2.82	<0.01	0.80

Table 2

Indirect Effects of Gender on Depression through Duration and Reward Values of Overt Behaviors Using Bootstrapping Technique (N = 82: 5000 Bootstrap Samples).

	Point Estimate	BCa 95% CI	
		Lower	Upper
<u>Simple Mediation</u>			
Total Domains Engaged	-.29	-1.90	0.38
Total Average Reward	-.82	-2.90	-0.02*
Social Reward	-1.20	-2.43	0.01
Physical Duration	.11	-0.42	1.07
Health/Hygiene Duration	-1.07	-3.29	0.43
Spiritual Duration	-.47	-1.38	0.47
Passive/Sedentary Reward	-1.12	-2.42	0.04
Sexual Duration	-.17	-0.99	0.47
Hobbies/Recreation Duration	-1.56	-5.66	-0.14*
Eating With Others Duration	-.68	-1.96	0.02
Eating With Others Reward	-1.13	-3.15	0.96
“Other Behaviors” Reward	-1.72	-4.57	-0.72*

BCa CI = Bias-corrected and accelerated confidence interval. Confidence intervals containing zero are considered non-significant.

Vita

Marlena Ryba was born in Pleszew, Poland to the parents of Izabela and Slawomir Ryba. She moved to the United States with her parents and older sister in 1994. After graduating from North Myrtle Beach High School, she continued her education at the College of Charleston in South Carolina. During her time at the College of Charleston, she held several internship positions that provided her with research and clinical experience. As an intern at the National Crime Victims Center, Marlena assisted and provided guidance to the families of victims and completed a research project. While interning at Bishop Gadsden Retirement Community, she was in charge of coordinating activities and provided assistance for the residents. Marlena also volunteered as a research assistant at Ralph H. Johnson Veteran Affairs Medical Center in the Memory and Neuropsychological Clinic. Marlena graduated in 2006 with a Bachelor of Science in Psychology. After graduation, Marlena worked as a case manager for the Pretrial Intervention Program in Conway, South Carolina. In 2008, she began her doctoral training in Clinical Psychology at the University of Tennessee in Knoxville, TN.