

Exploring the Relation between Identity Style and Bulimic Behavior

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Running head: The Functional Model of Bulimia

Abstract

Research on bulimic behavior has lead Polivy and Herman (2002) to suggest that bulimic behaviors serve a functional purpose to avoid engaging in identity formation. A conceptual model was formulated to test the functional model of bulimia. A sample of 213 female undergraduate students completed measures of self consciousness, aversive self-awareness, depression, desire to escape meaningful life issues, self-harming, bulimia, and identity avoidance. Structural equation modeling strategies revealed support for the functional model of bulimia. The investigation provides further evidence that eating disorders have implications for identity formation and that the study of non-clinical adolescent samples can provide insight into the nature of how bulimia and identity are related constructs.

Exploring the Relation between Identity Style and Bulimic Behaviour

Bulimia nervosa during adolescence is the eating disorder subtype characterized by cycles of binge-eating and compensatory behaviors or purging episodes. Compensatory behaviors are desperate attempts to prevent weight gain, and include methods such as purging, exercising, or fasting (Polivy & Herman, 2002). Bulimia nervosa is differentiated from anorexia as adolescents with the former fail to suppress their weight below 85% of its expectation for height and age (Polivy & Herman, 2002). Furthermore, adolescents diagnosed with bulimia nervosa do not experience amenorrhea, the loss of their menstrual cycle. The common confusion over this distinction is perpetuated by the subcategory of bulimic-type anorexia in the DSM-IV (Polivy & Herman, 2002). The current investigation will focus exclusively on bulimia and its characteristic behaviors.

The conceptual basis for eating disorders has long been explored in the literature. Intriguingly, a lack of etiological evidence for bulimia nervosa remains. Empirical investigations on eating disorders date back to the late 19th century and have debated between organic/genetic and social/psychological explanations (Surgenor, Horn, Plumridge, & Hudson, 2002). Little progress has been made in contemporary investigations towards resolving this epidemiological crisis. Polivy and Herman (2002) acknowledged that, “by the turn of the millennium, AN [anorexia nervosa] and BN [bulimia nervosa] were well-established – as was the research enterprise – but a clear understanding of the source of the disorders or how to prevent or treat them remained elusive” (p. 188). Causal explanations of bulimia nervosa are inhibited due to the inability to conduct experimental research on the phenomenon (Polivy & Herman, 2002). Polivy and Herman (2002) recognized that “much of the literature consists of atheoretical attempts to measure and correlate particular researcher’s favorite variables rather than attempting to test

etiological hypothesis about ED's [eating disorders]" (p. 17). The current investigation aims to contribute to the theoretical explanation of bulimia nervosa.

Eating disorders remain significantly more prevalent among females than males in the general population. Lewinsohn, Striegel-Moore and Seeley (2000) provide the lifetime prevalence rates of eating disorders as 23 per 1,000 female adolescents compared to 1.4 per 1,000 male adolescents. Accordingly, the current investigation will employ an all female sample. Furthermore, Lewinsohn and colleagues (2000) acknowledge the tendency of epidemiological investigations to focus on adult sample populations. They suggest a need to focus prospective designs on adolescents presenting target symptoms of the disorders. This approach has exceedingly practical implications for intervention strategies (Lewinsohn et al., 2000). Additionally, Lewinsohn and colleagues emphasized the necessity of considering non-clinical individuals displaying eating disorder symptomology or 'partial syndrome' (PS-ED) (Lewinsohn et al., 2002). To further investigate this phenomenon a non-clinical sample has been utilized in this study.

Several theoretical accounts of bulimia nervosa exist in contemporary literature (Heatherton & Baumeister, 1991; Polivy & Herman, 2002; Polivy, Herman, & McFarlane, 1994). Perhaps the design receiving the most compelling evidence to date is that of Polivy and colleagues (1994). These researchers propose that individuals engage in binge behaviours as a means of coping with threats to ego-identity (Polivy et al., 1994). Specifically they claim that, "rather than dwell on the direct threat of self-image, the dieter, by overeating, may put himself in a position to misattribute distress to the overeating itself; the distress of overeating is usually easier to deal with than is distress arising from more serious threats to one's emotional well-being" (Polivy et al., 1994, p. 505). Evidence for Polivy and McFarlane's (1994) theory

derives from a unique experimental investigation on the effects of induced stress on restrained eaters. The methodological format of this design lends to its efficacy in formulating a causal explanation of binge eating behaviour. Results of statistical comparisons between experimental and control groups confirmed that stress induced dieters consumed larger quantities of food regardless of its palatability. This finding evidenced the purposeful theory of bulimia where in binge behavior serves to alleviate identity related distress (Polivy et al., 1994; Polivy & Herman, 2002). Accordingly, this conceptual framework for bulimic binge behavior has been deemed the 'bulimia-as-purposeful' or 'functional theory of bulimia' in relevant literature (Wheeler, Adams & Keating, 2001). The present investigation will adopt the functional theory of bulimia as a means to explore etiological factors of the illness.

Wheeler and colleagues (2001) proposed a model to conceptualize Polivy et al.'s (1994) functional theory of bulimic behavior. Within this design, the dimensions of self-consciousness, aversive self-awareness, depression, desire to escape (significant life issues), and bulimic behavior, were found to collectively predict the avoidance of identity issues (Wheeler et al., 2001). A diffuse-avoidant identity style (the outcome of the model) is defined by Berzonsky and Adams (1999) as youth who are externally controlled, demonstrate high levels of procrastination, and defensive avoidance. These individuals are found to assume an external locus of control, display emotion-focused coping, and behave in an inconsistent manner across social situations (Berzonsky, 1992, 1994; Berzonsky & Ferrari, 1996 as cited in Adams, Munro, Doherty-Poirer, Munro, Peterson & Edwards, 2001). Compared to identity achieved, moratorium (those uncommitted to an identity orientation), and foreclosed (those who have not undergone an identity crisis and conform to other prescriptions for identity), identity-diffused youth remain uncommitted and avoid the exploration of identity issues (Berzonsky, 1989). Those individuals

who engage in the avoidance of identity reflection maintain a negative self-image and thus tend to be highly self-conscious and socially isolated (Adams, Abraham, & Markstorm, 1987).

Consequently, this type of identity processing style is found to be common among individuals with bulimia nervosa (Polivy & Herman 2002; Polivy et al., 1994; Wheeler et al., 2001).

Few investigations on bulimia nervosa have considered the relation between binge behavior and identity processing orientation (Wheeler et al., 2001). Accordingly, the current design aims to revalidate the bulimia-as-purposeful model, as found in Wheeler and colleagues' (2001) investigation. Updating the model via the utilization of a current sample population of late adolescents, as well as the administration of multiple measures for each construct of the design, will presumably evidence the efficacy of the functional model for explaining bulimic behavior.

Although Wheeler and colleagues (2001) present evidence for this model, their design fails to account for harmful behaviours associated with the diagnosis of bulimia. The relationship is currently unclear; however, a wide spectrum of self-harmful behaviors can be associated with bulimia nervosa (Favaro & Santonastaso, 2002; Sansone & Levitt, 2002; Sansone & Levitt, 2002; Wonderlich, Myers, Norton, & Crosby, 2002). The current design will expand the construct of bulimic behavior to allow for a thorough investigation of the disorder and its related self-harm behaviours.

The Functional Theory of Bulimic Behaviour

The current investigation will largely derive its conceptual basis from Wheeler, Adams and Keating's (2001) construction of a model for the functional theory of bulimia. These researchers conducted a linear structural equation analysis on a series of measures corresponding to the constructs of their design. Self-consciousness, aversive self-awareness (a combined

measure of perfectionism and ineffectiveness), depression, desire to escape (meaningful life issues), identity style, and bulimic behaviour were entered as variables of the model. Two independent analyses were run to test the models of the escape theory of bulimia (Heatherton & Baumeister, 1991) and bulimia-as-purposeful model (Polivy & Herman, 1994). Results of the analysis confirmed that diffuse-avoidant identity style did not predict bulimic behavior as suggested by the escape theory.¹ However, the model did fit the obtained data evidencing the bulimia-as-purposeful model (goodness-of-fit index, .98) (Wheeler et al., 2001). That is, bulimic behaviour and its interrelated constructs were believed to predict the manifestation of diffuse-avoidant identity style rather than the converse (Wheeler et al, 2001). On the basis of these findings, we replicated the bulimia-as-purposeful model utilizing an updated sample of late adolescent females. The aim was to seek further validation with additional measures as well as the reconsideration of measures included to assess the construct of bulimic behavior. This investigation is thought to add to the emerging body of etiological factors influencing bulimia nervosa.

Diffuse-Avoidant Identity Orientation

The manifestation of a diffuse-avoidant identity as the outcome of the functional-model of bulimia provides a central focus for the design. Erikson addressed the consequential status of identity crisis in his early writings on identity formation. In his original text, *Identity: Youth and Crisis*, Erikson (1968) provides the ingenious contention that,

the term identity confusion has a certain diagnostic significance which should influence the evaluation and treatment of such disturbance. Young patients can be violent or depressed, delinquent or withdrawn, but theirs is an acute and possibly passing crisis other than a breakdown of the kind which (sic) tends to commit a patient to all the malignant implications of a fantastic diagnosis... Thus we have learned to ascribe a

¹ Refer to Baumeister and Heatherton (1996), Dixon and Baumeister (1991), and Heatherton and Baumeister (1991) for a thorough explanation on the escape theory of bulimia.

normative 'identity crisis' to the age of adolescence and young adulthood (p. 17).

Although several recent investigations have been conducted on the maladjustment of diffuse-avoidant youth (Adams, Abraham, Markstrom, 1987; Adams et al., 2001; Berzonsky, 1992; Berzonsky & Adams, 1999), the occurrence of bulimic behavior has largely been neglected in such designs (exception see Wheeler et al., 2001).

Adams, Abraham, and Markstorm (1987) found diffuse-avoidant youth to be highly self-focused and self-conscious. Thus it seems that the avoidance of identity issues contributes to vulnerabilities to specific psychological conditions. Based on a structural equation analysis, Adams and colleagues (2001) proposed that the "most consistent findings across the analysis indicate that diffuse-avoidance is associated with both adolescent boys and girls being more likely to manifest conduct and hypersensitivity disorder behaviors" (p. 316). The researchers suggest that individuals who actively avoid identity formation are more susceptible to a variety of health and social problems (Adams et al., 2001).

Self-Harming Behaviors

In escaping the confrontation of identity issues, diffuse avoidant youth may engage in self-destructive behaviors (Adams et al., 2001). Therefore, it is necessary to consider the array of dysfunctional tendencies associated with the display of diffuse-avoidant identity style. To this end, we will consider the potential for self-harm behaviors found to be sometimes co-morbid with bulimia nervosa. Several recent studies have reported a relation between bulimia and self-harm behaviors (Bulik, Sullivan, Carter & Joyce, 1997; Favaro & Stantonastaso, 2002; Sansone & Levitt, 2002; Sansone, Wiedermen & Sansone, 1998; Wonderlich, Myers, Norton & Crosby, 2002). Of particular relevance to the current investigation is Sansone and Levitts' (2002) study on self-harm behaviors among those with eating disorders (2002). These researchers included

overdoses, and self-mutilation (cutting or burning oneself) in their definition of self-harm behaviors (Sansone & Levitt, 2002). Their review of literature based on articles in both PsycINFO and Medline resulted in the confirmation of many phenomenal trends. Specifically, Sansone and Levitt (2002) found the prevalence of self-harm behaviors among inpatients with bulimia nervosa to be 25%, and the prevalence of these behaviors to be even higher for the bulimia-alcoholic co-morbid groups (mean equal to 9.45 for self-harm behaviors in the eating disorder group, versus mean equal to 15.88 in the co-morbid group) (Sansone & Levitt, 2002). Although this is a finding of significant importance, the authors acknowledged that most of the reviewed literature did not account for specific self-harm behaviors (for example cutting, burning, and hitting oneself) (Sansone & Levitt, 2002). Furthermore, there remains a need for studies that are correlational in nature to supplement Sansone and Levitt's findings. The current investigation will include Sansone, Wiederman, and Sansone's (1998) measure for self-harm behavior within the construct of bulimic behavior. We aim to further establish an understanding of this self-destructive phenomenon. The present study accounts for the lack of correlational investigations on the prevalence of self-harm behaviors co-occurring with bulimia nervosa.

Hypothesized Model

In line with Wheeler and colleagues' (2001) conception that diffuse-avoidant identity processing is a likely outcome of bulimia and its intercorrelates, we propose that all positive relations will exist among the constructs of self consciousness, aversive self-awareness, depression, desire to escape meaningful life issues, self-harming and bulimia. The interconnections of these variables are expected to predict diffuse-avoidant identity processing orientation. That is, we expect the functional theory for bulimia nervosa to be reconfirmed. As the theory assumes that individuals with bulimia engage in binge eating as a means of avoiding

identity issues, we predict that a diffuse-avoidant identity style will be the consequential outcome of the illness.

Methods

Subjects

Participants included 213 female undergraduate students attending the University of Guelph (Ontario). As subjects were not selected on the basis of eating disordered behaviour, this was a non-clinical sample population. Approximately one half of the subjects were recruited via the subject testing pool for introductory psychology students, receiving 2.0 credits for their participation. One quarter of subjects were derived from an introductory adolescent development course and were also credited for their participation. The remainders were students enrolled in second and third year level psychology courses who participated in the study without incentive. The age of the students ranged between 18 to 25 years, with the majority being either 19 or 20 years old (34.3 % and 33.8% respectively). The highest level of education obtained by most of the subject's parents was at the post-secondary level (61.5%). Most participants were of North American decent (76.1%), although one percent of the sample was African American, three percent were Asian and 19.2% were descendent of another origin.

Measurements²

Self Consciousness. This construct was measured via the Self-Consciousness Scale Revised (Schiefer & Carver, 1985) and the Social Awareness Inventory (Shelden, 1996).

Schiefer and Carver (1985) refer to self-consciousness as the “tendency to think about and attend to the more covert hidden aspects of the self, aspects that are personal in nature and not easily accessible to the scrutiny of other persons” (p. 687).

² We will correct for differences in alpha levels across the constructs by using the formula $1 - \alpha$ in the data analysis.

The Self Consciousness Scale Revised version contains 22 items measured on a four-point scale from 3 (a lot like me) to 0 (not at all like me). Cronbach's alpha for the subscales of private self-consciousness, public self-consciousness, and social anxiety were reported to be .75, .84, and .79 respectively. Test-retest correlations were reported at .76, .74, and .77 for the subscales (Scheier & Carver, 1985). A sample item from the scale includes, "I think about myself a lot" measured on a four-point scale.

The Social Awareness Inventory (SAI) includes 64 items measured on a four-point scale from (0) very uncharacteristic of me, to (3) very characteristic of me. A sample item is, "I reflect about myself and my inner motives a lot". Sheldon (1996) has reported that "all subscales demonstrated internal consistency exceeding the goal of .70 except the subscale assessing awareness of others experience from the self perspective" (alpha = .68) (p. 623).

Averse self-awareness. The subscales of EDI-Perfectionism, and EDI-Ineffectiveness from the Eating Disorder Inventory (EDI; Garner, Olmstead, & Polivy, 1983), were utilized as a combine measure for averse self-awareness. The EDI-P consists of six items "assessing excessive personal achievement expectations for personal achievement" (Garner et al., 1983, p. 18). A sample item includes, "I hate being less than the best at things".

The EDI-I includes 10 items assessing negative self-evaluations (i.e. "I feel alone in the world) (Garner et al., 1983). The EDI is rated on a 6-point scale ranging from 3 (always) to 0 (never). The EDI-P is significantly correlated with Hopkins' Symptom Checklist interpersonal sensitivity subscale ($r = .51, p < .001$). The EDI-I was found to significantly correlate with the EAT self-esteem subscale ($r = .76, p < .001$) (Garner et al., 1983). These results evidence the

adequate level of convergent validity for the subscales. Cronbach's alpha measure for internal consistency was reported at above $r = .80$ (Garner et al., 1983).³

Depression. Enduring depressive affect was measured via the Beck Depression Inventory (Beck, 1978). This scale consists of 21 groups of statements with corresponding options measured on a 4-point scale ranging from 0 to 3. A sample item includes (0) I do not feel sad, (1) I feel sad, (2) I am sad all the time and I can't snap out of it, (3) I am so sad or unhappy that I can't stand it" (Beck, 1978). The Cronbach's alpha coefficient for the scale was .81 for a non-psychiatric sample (Beck, Steer, & Garbin in press, as cited by Beck, Rush, & Shaw, 1979). Test-retest estimates for the inventory were reported at .90 (Beck, Rush, & Shaw, 1979). Meta analysis of the scale revealed a mean correlation of .60 for clinical cases of depression and non-clinical cases (Beck et al., 1979).

Desire to Escape. The desire to escape meaningful life issues was measured via the Avoidance of Existential Confrontation Scale (AEC Scale; Thauberger & Sydiaha, 1977). The avoidance of ontological confrontation is defined as, "any attempt to escape from the 'givens' of life or the natural circumstances of a human individual" (Thauberger, Ruzinsky, & Cleland, 1981, p. 748). The scale consists of 36 items, measured on 7-point rating scales. A sample item includes, "There is (1) no purpose to life to (7) purpose to life". Reliability indexes are reported to range from $r = .62$ to $.73$ (odd-even). A two-week test-retest correlation coefficient of $r = .75$ has been reported (Thauberger, Ruzinsky & Cleland, 1981). Thauberger and Sydiaha-Symor (1977) proposed that despite previous suggestions, the avoidance of existential issues remains distinct from the construct of neuroticism.

³ The EDI-P and EDI-I subscale items are counter balanced in the questionnaire to account for differential responding.

Identity Style. Identity has been defined by Adams and Berzonsky as a “perceived sense of self unity across situations and persistence in personality over time” (1977, p. 562). This construct will be measured by two identity inventories.

The Identity Style Inventory Revised (ISI-3) (Berzonsky, 1992) consists of 40 items measured on a 5-point scale ranging from, (1) not at all like me, to (5) very much like me. An example from the ISI-3 is “I’m not really sure what I’m doing in school; I guess things will work themselves out”. The ISI-3 yields a subscale measure of diffuse-avoidant identity style relevant for the current design. Test re-test reliability for a two- week interval for diffuse-avoidant style was reported at .83. Berzonsky (1992) reported the alpha co-efficient for diffuse-avoidant identity style at .76.

The Objective Measure of Ego Identity Status (OMEIS), (Adams, Shea, & Fitch, 1979) was administered as a supplementary measure for identity. This scale contains 24 items with a corresponding 6-point scale ranging from ‘strongly agree’ to ‘strongly disagree’. A sample item includes “My parents had it decided a long time ago what I should go into, and I’m following their plans” (Adams et al., 1979). The OMEIS yields a subscale measure of diffuse-identity status. The convergent-divergent correlation range for the diffuse-identity subscale was reported at .66 (Adams & Ethier, 1999). Test-retest reliabilities over a four-week period ranged from .71 to .93. Internal consistency was reported at median Cronbach’s alpha equal to .66. Predictive validity, computed between nine indices ranged from -.25 to +.22 (Adams & Ethier, 1999).

Bulimic behavior. Bulimic behavior was measured via the Bulimia Test-Revised (BULIT-R; Thelen, Farmer, Wonderlich, & Smith, 1991). The BULIT-R is comprised of 36 items all of multiple choice format with 5 response options. An example of an item from the BULIT-R is “would you presently call yourself a “binge eater”? (1) Yes, absolutely, (2) yes, (3)

yes, probably, (4) yes, possibly, and (5) no, probably not. The BULT-R has been found to have high predictive validity with an overall validity coefficient obtained by correlating the BULIT-R with bulimic and control groups ($r = .67, p < .001$). The internal consistency of the scale was reported at Cronbach's alpha = .97. Test-retest reliability is exceptionally high for the BULT-R at .95 (Pearson product-moment correlation) (Thelen et al, 1991).

The Self-harm Inventory (SHI) was administered as a measure for self-harm behaviors often found to be co-morbid with bulimia nervosa (Sansone, Sansone, & Wiederman, 1995). The SHI consists of 22 items requiring respondent to indicate 'yes' or 'no' to behaviors which individuals may intentionally engage in to harm themselves. A sample item from the SHI reads, "[have you ever intentionally] abused alcohol?" The overall accuracy of the SHI for detecting individual's with borderline personality was 87.9% (kappa = .51) (Sansone et al., 1998). Sansone and colleagues (1998) failed to report reliability coefficient within their report.⁴ However, the need for further validation is acknowledged.

Procedure

Participants were informed that they would be taking part in a study aimed to investigate the individual tendencies, eating behaviors, and feelings on life in general of female university aged students. Subjects were verbally informed on their right to participate in the study while those in agreement signed a general consent form. A series of group sessions were held in which subjects recruited via the mass testing pool completed the battery of questionnaires. Mass testing pool subjects were provided with a written description of the nature of the investigation. Subjects obtained from the adolescent development and psychology courses were provided with questionnaires and required to return completed versions in subsequent lectures. Following their

⁴ Perhaps this is due to the variable patterns of self-harm behaviors. This may impede on efforts to establish test-retest reliability.

participation in the study, subjects were provided with a debriefing form and contact information for the project director, student coordinator, and available counseling services.

Results

Data Analysis Strategies

Initial data analysis procedures included the generation of means and standard deviations for each variable, the alpha levels for each measure, and a correlation matrix. The final data analysis was a linear structural equation modeling procedure to produce a theoretical illustration of the data.

Descriptive Statistics

The means, standard deviations and individual scale alphas are reported in Table 1. The alphas ranged from a low of .53 to a high of .94 with most indicating an acceptable level of internal reliability. The average alpha for the 13 variables was calculated to be .79. All of the means and standard deviations were within appropriate limits for each scale.

Correlations between all of the variables are reported in Table 2. The majority of hypothesized associations were observed to be significant. Forty-six of seventy-eight (59%) correlations were significant at the .05 level or above. As one would expect four cases of significance at the .05 level by chance alone, the correlations among variables were concluded to have a high level of overall significance.

However, due to the complexity of the correlations, differences in internal consistency for the measures, and the possibility of correlations between predictor variables, the focus of the analysis was upon the linear structural equation model. This form of analysis compensates for different levels of alpha and possible correlations between predictor variables. Essentially, linear

structural equation modeling techniques result in a pattern of relations that allow one to report associations that are significant, while controlling for all other significant associations.

General Model

The conceptual model guiding the analysis is reported in Figure 1. The exogenous (independent) variables included self-consciousness, ineffectiveness, and perfectionism. The endogenous (outcome) variable was diffuse-avoidant identity style. The variables of depression, desire to escape, and bulimic behavior were interlinking and indirect associations between the exogenous variables and outcome measure.

Structural Equation Modeling

A linear structural equation modeling procedure was employed for its powerful ability to test relations among interconnected variables. This methodology allows the use of correlational data to determine the possible fit of a theoretical model to a specific population (Fassinger, 1987).

The correlational data from the original theoretical model were entered into the structural equation analysis (LISREL VII; Jöreskog & Sörbom, 1999). This theoretical model is included in Figure 1. All measures were corrected for attenuation in reliability. Seven individual steps were undertaken to arrive at the final over-identified model. The entered steps are reported in Table 3. Each step included either the establishment of the just-identified model or additional pathways the analysis recommended to be included via the modification index. The modification index indicates the minimum improvements in the chi-square statistic that could be obtained by adding paths to the model (Fassinger, 1987). The final over-identified model is reported in Figure 2. All significant paths and standardized beta weights are included in the diagram. The chi-square value for the overall model was $\chi^2(43, N = 213) = 54.43, p = .12$. The non-significant

chi-square statistic indicates the model is plausible in the current population of undergraduate females. The root mean square error of approximation was .03, the goodness-of-fit index was .96, and the adjusted goodness-of-fit was .92. This indicates that the final model accounts for 92% of the covariance among variables and is considered to be an excellent fit (Fassinger, 1987).

Analysis of the derived model begins with the exogenous variables located along the left-hand side of Figure 2. Here, private self-consciousness had a positive association with diffuse-status ($\beta = .28$), a negative association with diffuse-avoidance ($\beta = -.19$), and a positive association with depression ($\beta = .16$). Self-awareness (from the self perspective) maintained all positive associations among the variables of diffuse-avoidance ($\beta = .27$), diffuse-status ($\beta = .24$), and desire to escape life issues ($\beta = .38$). Self-awareness (from others' perspective) was negatively associated with bulimic behavior ($\beta = -.14$). The final exogenous variable, ineffectiveness, was positively related with depression ($\beta = .63$).

Progressing across the model, the variable of depression assumed both positive associations with bulimic behavior ($\beta = .32$) and self-harm behaviour ($\beta = .22$). Contrary to our hypothesis, the variables of desire to escape and self-harming behaviors unassociated with further variables in the model. Bulimic behavior yielded the expected association with diffuse-avoidant identity style ($\beta = .25$).

Overall there appears to be three embedded models within the final structural equation model reported in Figure 2. Two of the sub-models are neither connected with bulimic behaviour nor diffuse-avoidant identity style. The first embedded model included the associations of both private self-consciousness ($\beta = .28$), and self-awareness (from the self perspective) ($\beta = .24$), with diffuse-status. These constructs accounted for 10% of the variance in diffuse-status.

The second embedded model included the association between self-awareness (from the self-perspective) and desire to escape life issues ($\beta = .38$). Self-awareness accounted for 14% of the variance in desire to escape.

The final model was of most importance to the focal intent of the study. This model involved the relations between private self-consciousness ($\beta = .16$) and ineffectiveness ($\beta = .63$) to depression, which in turn associated with bulimic behavior ($\beta = .32$). These associations had a positive relation with the outcome measure of diffuse-avoidant identity style ($\beta = .25$). Self-awareness, from the both the self and others' perspectives, also had significant associations with bulimic behavior ($\beta = .38$ and $\beta = -.14$ respectively) and collectively predicted diffuse-avoidant identity style ($\beta = .25$). The major model accounted for 18% of the variance in diffuse-avoidant identity style.

The aforementioned associations provide strong support for Wheeler and colleagues' (2001) preliminary findings confirming the functional theory of bulimic behavior. Essentially the model suggests that individuals who experience a high degree of self-consciousness, coupled with feelings of ineffectiveness, are likely to be depressed, to engage in bulimic behaviors, and ultimately to avoid engaging in identity development. A revised version of the primary theoretical model is included in Figure 3.

Discussion

The hypotheses of positive relations among the interconnected variables of the model was supported by all associations with the exception of the relations between self-awareness (from others' perspectives) and bulimic behavior ($\beta = -.14$), as well as private self-consciousness with diffuse-avoidant identity ($\beta = -.19$). The negative associations are best explained by the alternative measures used to assess the construct of self-consciousness in Wheeler and

colleagues' (2001) original study. Specifically, the private self-consciousness sub-scale of the Self-Consciousness Scale (Schier & Carver, 1985) yielded more significant paths in the current model compared to the public self-consciousness scale in the original investigation (Wheeler et al., 2001). Furthermore, the Social Awareness Inventory (SAI; Sheldon, 1996) was administered as a novel measure in the current study. The SAI indicated that individuals who engage in being aware of them self from an external (others') perspective are less likely to engage in bulimic behaviors, as compared to individuals who engage in self-awareness from an internal perspective. Individuals with bulimia nervosa behaviors appear to be genuinely self-critical. It seems that these individuals are unable to assume an outsider's perspective on the self and thus fall victim to their idiosyncratic views. Possible explanations for these findings are the topic of latter discussion.

Aside from minor exceptions, the current replication of the general theoretical model from Wheeler and colleagues' (2001) original report provided strong evidence for the functional model of bulimic behavior. The theory corresponding with the functional model posits that individuals who engage in bulimic behaviors (binge eating followed by compensatory behaviours) do so as a means of refocusing threats to their ego-identity. In doing so, these individuals ultimately avoid the search for identity development (Polivy & Herman, 2002; Polivy & Herman, 1999; Polivy, Herman & McFarlane, 1994; Wheeler et al., 2001).

Polivy and Herman (1999) further provided the explanation that dieters often utilize binge behavior as a means of re-attributing their negative affect to eating rather than to ego-related distress. This theory has received empirical support in the literature relative to alternative explanations as posited by the psychosomatic comfort, learned helplessness, distraction, and escape theories of bulimic behaviour (refer to Heatherton & Baumeister, 1991 and Polivy &

Herman, 1999 for thorough theoretical explanations). Findings of the current study evidenced the phenomenon wherein university-aged females, who display binge-eating behavior, do so for the purpose of avoiding their normative search for identity. These individuals presumably blame their overwhelming threats to identity on dysfunctional patterns of eating behavior. The findings support the fundamental role of identity issues in the etiology of bulimia nervosa.

Although the current theoretical model (Figure 2) provided evidence for the functional theory of bulimia, several unexpected findings in this study emerged that warrant further consideration. Of particular interest was the lack of a relation between bulimic and self-harming behaviors. Contrary to the hypothesized positive correlation between these behaviors, a slight negative correlation ($r = -.17, p < .05$) was found. This finding implies that individuals with bulimic tendencies in the current sample were less likely to engage in self-harming behaviors. The slight negative association may be explained by the use of a non-clinical sample population in the current study. Favaro and Santonastaso (2002) found self-injurious behaviour to have a significant clinical impact on anorexia and bulimia nervosa. If a clinical sample had been utilized in this study, self-harming might have contributed more predictive validity in the theoretical model.

The small negative correlation between self-harming and bulimic behaviour may be equally explained by the complex association between these phenomena as reported in the literature. Wonderlich, Myers, Norton and Crosby (2002) proposed that co-morbid conditions, such as borderline personality disorder and multi-impulsive bulimia (a highly impulsive subset of bulimic individuals), may be a third factor influencing the complex relation between bulimia and self-harm behaviours. The authors confirmed that the mediating relationship between the behaviors remains unclear (Wonderlich et al., 2002). Sansone and Levitt (2002) suggested that

personality disorder is almost always present among individuals with eating disorders who engage in self-harm behaviour. This finding provides further support for a possible indirect relation that exists between bulimia and self-harm behavior. Factors mediating this relation were evidently overlooked in the current study.

Favaro and Santonastaso (2002) found that self-injurious behaviours have a non-categorical relation with eating disorders but rather form a continuum. Favaro and Santonastaso (2002) suggest that these behaviours may be directly self-aggressive (i.e. skin cutting or nail biting) or indirect (i.e. alcohol or drug abuse). As the majority of items included in the Self-Harm Inventory (SHI) primarily measure direct self-harming behaviors, future investigations should aim to include measures that assess more indirect forms. This may be of significant value in determining the relation within non-clinical sample populations who undoubtedly engage in less extreme self-harming behaviors than clinical groups. The established association between alcoholism and bulimic behavior in the literature provides further support for this conclusion (Bulik, Sullivan, Carter & Joyce, 1997). It might be concluded that individuals with bulimia are more likely to partake in 'escape behaviors' such as alcohol consumption than overt forms of self-injurious behavior.

A finding, which posed further inquiries in the current design, was the differential relation between diffuse-avoidance (as measured by the Identity Style Inventory) and diffuse-status (as measured by the Objective Measure of Ego Identity Status) and the interrelated constructs of the model. Where diffuse-avoidance was highly intercorrelated with private self-consciousness, self-awareness (from self and others' perspectives), depression, and bulimic behaviour; diffuse-status was only found to associate with private self-consciousness and self-awareness from the self-perspective. The associations of the model imply that diffuse-avoidance

and diffuse-status are states of identity that may operate independent of one another. The Identity Style Inventory (ISI; Berzonsky, 1992) and the Objective Measure of Ego Identity Status (OMEIS; Adams, Shea & Fitch, 1979), seem to be tapping into separate concepts of identity development. This was an unexpected finding as the ISI was constructed to closely match the identity-statuses of the OMEIS (Berzonsky, 1989). However, the difference may lie in the specificity of the OMEIS, as well as its focus on the domains of occupation, religion, and politics, relative to the ISI (Berzonsky & Adams, 1999) focus on decision-making processes. In addition, Serafini and Adams (2002) found the identity-status groups of the OMEIS to be associated with the functions of identity. Specifically, the researchers found the diffuse-status group to maintain a passive function of identity development wherein individuals rely on external self-processes (such as imitating others) (Serafini & Adams, 2002). This provides further evidence for conceptual differences that exist between the various measures of identity.

As the outcome variable of diffuse-avoidance was most central to the primary theoretical model (refer to Figure 3), the ISI was considered to be the most appropriate measure for the current analysis. Thus the study assumed that individuals who attain a diffuse-avoidant style are those who avoid dealing with personal problems as well as basic identity issues (Berzonsky, 1992). A comparative analysis between the ISI and OMEIS is recommended in future designs of this nature. Such investigations are necessary in order to confirm the conceptual differences underlying these measures of identity.

Contrary to Wheeler and colleagues' (2001) investigation, as well as several previous empirical reports on eating disorders (Halmi, Sunday, Strober, Kaplan, Woodside, Fichter, Treasure, Berrettini & Kaye, 2000; Polivy & Herman, 2000), the construct of perfectionism failed to form any significant associations in the current study. The absence of perfectionism, as

an exogenous variable in the primary theoretical model, is partly explained by Polivy and Hermans' (2002) report stating that, while perfectionism has been consistently associated with anorexia nervosa, it has not been related to bulimia nervosa to the same extent. Similarly, Halmi and colleagues (2000) found perfectionism to hold such a strong association with anorexia nervosa, that it was considered a phenotype of the disorder. Furthermore, the researchers found perfectionism to be more pronounced in anorexia nervosa subjects who engaged in only purging behaviors in the absence of binge eating behaviors (Halmi et al., 2000). Together the findings suggest that ineffectiveness may be a better indicator of aversive-self awareness than ineffectiveness being in combination with perfectionism, for predicting bulimic behavior.

Private self-consciousness proved to be a superior indicator, over public self-consciousness, of the interconnected variables of the model. Again this finding runs counter to the results of Wheeler and colleagues' (2001) analysis. It is possible that individuals with bulimia nervosa are so focused on their problematic eating behaviors that they are unable to conceptualize an external view of the self. Perhaps this focus on a negative self-perspective is what perpetuates the disorder. However, the inclusion of the private self-consciousness scale in the model makes intuitive sense considering the high predictive validity of self-awareness from an internal perspective (self perspective) that was also found. Private self-consciousness "refers to the tendency to think about and attend to the more covert, hidden aspects of the self, aspects that are personal in nature and not easily accessible to the scrutiny of other persons" (Scheier & Carver, 1985, p. 687). Apparently subjects in our sample, who engaged in bulimic behaviors, were more likely to assume an internal focus on the self rather than valuing external self-evaluations. However, this finding negates the recent association between bulimia and sociotropy, the tendency to seek others' approval, in the literature (Duemm, Adams, & Keating,

in press; Narduzzi & Jackson, 2002). Further replications of the relation between private self-consciousness and bulimia nervosa are required in order to confirm the plausibility of this association.

In agreement with Wheeler and colleagues' (2001) findings, desire to escape life issues held no predictive validity in the bulimia-as-purposeful model. As desire to escape life issues assumes a central role in the functional theory (Polivy & Herman, 1999), it is suggested that an alternate measure of this construct be administered in prospective studies. The lack of an association between desire to escape and bulimic behavior is most likely explained by the inadequate psychometric qualities of the Avoidance of Existential Confrontation Scale (Wheeler et al., 2001).

As two of the embedded models of the analysis held no associations with either diffuse-avoidance or bulimic behaviour, they are of little relevance for the current discussion. However, these pathways should not be overlooked in future investigations of their domains. Accordingly, the findings have implications for research on self-consciousness as well as identity-status development.

The primary theoretical model, which was the emphasis of this investigation, has significant implications for research on the etiology of bulimia nervosa. Most importantly, the reconfirmation of the functional model provides strong evidence for this theoretical account of bulimia nervosa. The model confirms a pattern of associations between self-consciousness, self-awareness, ineffectiveness, depression and bulimic behaviour in predicting the avoidance of identity issues. The functional model provides evidence for the antecedents (self-consciousness, self-awareness, ineffectiveness, depression) and consequence (a diffuse-avoidant identity) of bulimia nervosa. Furthermore, our findings highlight the importance of intervention at the sub-

clinical level in the population of late-adolescent females. Targeting the initial symptoms of self-consciousness, self-awareness, ineffectiveness, and depression, may be effective in the prevention of bulimia nervosa, and in turn, the manifestation of diffuse-avoidant identity. Such intervention strategies are critical considering the dysfunctional characteristics associated with diffuse-avoidant identity in the literature (procrastination, maladjustment, conduct problems, hyperactivity etc.) (Adams, Munro, Doherty-Poirer, Munro, Petersen & Edwards, 2001). Diffuse-avoidant identity style seems to expose individuals to risk of developing a host of co-morbid health conditions (Adams et al., 2001).

In line with the aforementioned associations, individuals with bulimia nervosa should be targeted for therapeutic interventions aimed at resolving the avoidance of the normative search for identity. Bulik, Kenneth, and Kendeer (2000) provided a useful description of identity-focused therapy for eating disorders. Individuals with bulimia nervosa presumably benefit from ‘talk therapy’ with the goal of achieving healthy identity development.

Limitations of the current investigation mainly relate to the nature of the design. Primarily, although linear structural equation modeling allows for a causal examination of interactional relations among variables, it is mainly a correlational technique (Fassinger, 1987). Designs providing experimental accounts of the phenomena are necessary in order to establish the causality of the model’s relations (refer to Polivy et al., 1994). Longitudinal investigations tracing the long-term effects of identity development among individuals with bulimia would provide further support for the design (Wheeler et al., 2001).

Overall, the current replication of the functional model of bulimic behaviour provides strong evidence for the cognitive tendencies involved in this condition. As intended, our analysis contributes to the body of theoretical accounts of bulimia nervosa in the literature. Such

investigations delineate primary factors contributing to the disorder and, thus, should be utilized in guiding approaches of intervention.

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Table 1

Alpha, Mean, and Standard Deviation for each Measure

Measures	Alpha	Mean	SD
SC-Private	.73	15.41	3.82
SC-Public	.87	14.11	4.43
SC-Anxiety	.83	10.76	3.44
SA-Self	.92	57.88	13.33
SA-Other	.93	51.63	13.47
EDI-Perfectionism	.81	16.35	6.12
EDI-Ineffectiveness	.89	21.88	3.55
Beck Depression	.87	9.23	7.08
AEC	.55	162.94	14.05
Diffuse-Avoidance	.64	26.85	5.65
Diffuse-Status	.53	20.26	4.99
BULIT-R	.94	110.48	6.77
Self-Harm	.75	1.07	1.41

Note. SC = Self Conscious Scale; SA = Self-Awareness Inventory, from self and other's perspectives; EDI = Eating Disorder Inventory; AEC = Avoidance of Existential Confrontation; BULIT-R = Bulimia Test-Revised.

Table 2

Correlation Matrix for all Measurements

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SC-Private	—												
2. SC-Public	.32**	—											
3. SC-Anxiety	.21**	.45**	—										
4. SA-Self	.47**	.37**	.31**	—									
5. SA-Other	.30**	.50**	.40**	.72**	—								
6. Perfectionism	.15*	.21**	.17*	.28**	.31**	—							
7. Ineffectiveness	.31**	.31**	.26*	.22**	.27**	.27**	—						
8. Depression	.24**	.31**	.21**	.18**	.19**	.23**	.49**	—					
9. AEC	.13	.31**	.29**	.24**	.33**	.18**	.18**	.25**	—				
10. BULIT-R	-.04	-.09	-.11	.02	-.12	-.06	-.20**	-.12	.01	—			
11. Self-Harm	.07	.10	.02	.14*	.03	.00	.26**	.42**	.02	-.17*	—		
12. Diffuse-Avoid	-.05	.12	.24**	.11	.29**	.05	.13	.18**	.11	-.26**	.13	—	
13. Diffuse-Status	.18**	-.05	-.11	-.06	-.07	.02	.07	-.02	.11	.07	-.12	-.25**	—

Note. SC = Self Consciousness Scale; SA = Social Awareness Inventory; AEC = Avoidance of Existential Confrontation;

BULIT-R = Bulimia Test Revised; * $p < .05$, two-tailed. ** $p < .001$, two-tailed

Table 3

Chi-square, Root Mean Square Error, and Goodness of Fit Indexes for the Proposed Model

	Steps and Variables	Chi-square	RMSEA	GFI	AGFI
1	Original Model	79.74, $p = .00$	.09	.95	.88
2	Trimmed Model	92.59, $p = .00$	.06	.94	.88
3	Add SCS-Private to Depression	84.33, $p = .00$	.06	.95	.89
4	Drop Perfectionism to Depression, add SCS-Private to OMEIS-Diffusion	79.80, $p = .001$	.06	.95	.90
5	Add SA-Self to OMEIS-Diffusion	71.80, $p = .007$	.05	.95	.90
6	Add SA-Self to ISI-Diffuse-Avoid	62.71, $p = .03$	.04	.96	.91
7	Add SCS-Private to ISI-Diffuse-Avoid	54.43, $p = .12$	.03	.96	.92

Note. SCS = Self-Consciousness Scale; OMEIS = Objective Measure of Ego Identity Status Scale; SA = Social Awareness Inventory; ISI = Identity Style Inventory.

RMSEA = Root Mean Square Error of Approximation; GFI = Goodness of Fit Index; Adjusted Goodness of Fit Index.

Figure Captions

Figure 1. The original theoretical model derived from Wheeler and colleagues (2001).

Figure 2. The current theoretical model with beta weights (β), and multiple correlations squared (R^2). $X^2(43, N = 213) = 54.43, p = .12, GFI = .96, Adjusted GFI = .92, Root Mean Square Error = .03$.

Figure 3. The primary theoretical model.





