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Initial Development and Validation of the Deliberate Denial of Disordered Eating Behaviors Scale

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INITIAL DEVELOPMENT AND VALIDATION OF THE DELIBERATE DENIAL OF DISORDERED EATING BEHAVIORS SCALE

by

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ABSTRACT

INITIAL DEVELOPMENT AND VALIDATION OF THE DELIBERATE DENIAL OF DISORDERED EATING BEHAVIORS SCALE

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It is common for individuals who engage in disordered eating behaviors to intentionally conceal symptomatology. The purpose of this study was to develop a reliable and valid measure of deliberate denial as it relates to disordered eating behaviors in a non-clinical population. Deliberate denial of disordered eating behaviors can be defined as any conscious omission, concealment, or misrepresentation of behavior related to disordered eating. The present scale was developed within the context of two studies. Study 1 focused on item generation. Items were based on the definition of deliberate denial of disordered eating behaviors, taken from existing eating disorder assessments and questionnaires, and generated from retrospective survey data. Then, three focus groups ($N = 13$) were asked to generate and review items. Results of the focus group suggested nearly all items (93%) are face valid, with participants indicating they assess aspects of deliberate denial of disordered eating. Focus group members generated 9 new items that were added to the scale. Next, an expert panel ($N = 5$) composed of eating disorder researchers and clinicians provided feedback on the questionnaire structure, instructions, response scale, item phrasing, and the scale utility. Overall, the expert panel endorsed the utility of the scale. They confirmed that a similar scale does not exist elsewhere in the research literature and that it possesses construct validity. Study 2 took the items generated from Study 1, administered the items to 311 undergraduate female students, and an exploratory factor analysis (EFA) was conducted on the responses in order to derive the factor structure of the scale. An exploratory factor analysis (EFA) with varimax rotation was conducted (KMO=.95, Bartlett's

Test of Sphericity: $\chi^2(741)=12{,}539.79$, $p<.001$). Initially, five factors emerged; many items cross-loaded and four factors included items measuring denial of specific behaviors, which by design could not be completed by all participants. Thus, only the first part of the scale was retained. An EFA was conducted on these items utilizing an approach that expects a unidimensional scale: quartimax roatation. For the EFA using quartimax rotation (KMO=.96, Bartlett's Test of Sphericity: $\chi^2(136) =5{,}430.40$, $p <.001$), two factors emerged that contained eigenvalues over 1.00. Items were then reviewed for redundancy and a 12-item scale was identified. A third EFA was conducted on the 12-item scale and a single factor emerged (loading range=.67-.86, eigenvalue=6.46). The unidimensional scale possessed strong internal consistency (α=.94). It was correlated positively with concealment and disordered eating and negatively with disclosure, indicating criterion and convergent validity. It was not associated with social desirability, suggesting discriminant validity. This 12-item scale is the first to measure deliberate denial of disordered eating and can be used to examine the role of denial in the onset and maintenance of disordered eating. Denial likely increases interpersonal problems that may, in turn, increase disordered eating and decrease help seeking behaviors, illuminating a need to address denial in identification, prevention, and treatment efforts.

This thesis is dedicated to my parents, Scott and Pam Howard, for their unconditional love and support in pursuing my passions.

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CHAPTER I

INTRODUCTION

Secrecy about and concealment of eating behaviors are common in people with eating disorders. In fact, retrospective surveys indicate that the majority (72%) of eating disorder patients deny that anything is wrong in the beginning months of their eating disorder and a quarter of patients never disclose their eating disorder to family, friends, or health care professionals (Noordenbos, 1992; SABN, 2003). Denial can be defined as any consciously or unconsciously motivated omission, concealment, or misrepresentation of behavior or internal experience (Vitousek, Daly, & Heiser, 1990). The prevalence of denial among people with eating disorders has been shown through empirical research. Newton, Butler, and Slade (1988) found that of 66 women referred for eating disorder assessment, the individuals who were more likely to be diagnosed with an eating disorder were also more likely to report lower scores on the Eating Attitudes Test (EAT), a self-report measure of disordered eating. Similar to Newton, Butler, and Slade (1988), the majority of past research on denial in eating disorders has focused on denial in terms of refusal to endorse disordered eating in self-reports (Couturier & Lock, 2006; Pryor, Johnson, & Wiederman, 1995; Vandereycken & Vanderlinden, 1983). These studies have measured denial in clinical populations by having patients with known eating disorder diagnoses fill out self-report measures of disordered eating, such as the Eating Disorders Inventory (EDI) or EAT, with lower scores suggesting denial (i.e. if an individual with a known eating disorder does not self-report disordered eating they are denying the problem). However, operationalizing denial in this way does not capture the nuances of denial. Denial is a heterogeneous term that can refer to behavior or cognitions, a state or trait condition, and conscious or unconscious thoughts and actions. In order to better understand denial among

individuals who engage in disordered eating, it is important to begin operationalizing and distinguishing between these different facets of denial

Denial can be categorized as either: 1) unintentional denial (i.e., impaired self-awareness, lack of knowledge) or 2) deliberate distortion (i.e., refusal of self-disclosure, dishonesty; Vandereycken, 2006b). Assessing unintentional concealment via a self-report measure is nearly impossible because it takes awareness of a behavior or cognition to self-report on it. However, deliberate denial may be measurable using self-report. The purpose of this study is to develop a reliable and valid self-report measure of deliberate denial as it relates to disordered eating behaviors (i.e., unhealthy eating patterns that reflect symptoms of an eating disorder) in a nonclinical population. It is particularly important to develop this scale in a non-clinical population (i.e., with individuals who are not currently in treatment for an eating disorder, but engage in, at least, subclinical levels of disordered eating), as individuals who deny problematic behaviors are also likely to avoid treatment settings. By more narrowly defining one facet of denial, we can begin to investigate the impact symptom denial has on interpersonal relationships, early identification and prevention of eating disorders, help-seeking behaviors, and diagnostic significance.

Deliberate Denial and Disordered Eating

Individuals who struggle with disordered eating lie and conceal symptomatology for different reasons. An important distinction is made in the literature between denial in individuals who restrict food (i.e., limit the amount of food they eat) and denial in individuals who binge (i.e., lose control over eating). People who restrict food will often lie about disordered eating behaviors because they do not want someone to intervene on their behaviors. For some individuals who engage in dietary restriction, their behaviors have even become a part of their

identity: a phenomenon known as egosyntonicity (Vandereycken, 2006a). Therefore, a tendency to "fake good" is in defense of their sense of self. Other individuals who restrict food may deny eating disorder symptoms because their disordered eating behaviors give them a sense of self-efficacy or achievement, and they hide their behaviors from others so they will not lose this sense of control and success (Vitousek, Daly, & Heiser, 1990). Individuals who binge differ from individuals who restrict in that they will more often conceal symptoms out of shame and fear of negative evaluation (Petterson, Rosenvenge & Ytterhus, 2008; Vitousek, Daly, & Heiser, 1990).

Although there may be differences in why denial is manifested in individuals who engage in different types of disordered eating behaviors, there are also some similarities. Eating disorders are often heterogeneous and many individuals who engage in restrictive dieting also engage in compulsive over-eating. In addition, it is likely that, to some extent, individuals conceal eating disorder symptomatology regardless of specific disordered eating behavior, because they do not want to be labeled or diagnosed as problematic and face stigmatization (Vandereycken, 2006a).

Deliberate Denial of Disordered Eating in Nonclinical Populations

By augmenting Vitousek, Daly and Heiser's (1990) definition of denial, deliberate denial of disordered eating behaviors can be defined as any conscious omission, concealment, or misrepresentation of behavior related to disordered eating. The Deliberate Denial of Disordered Eating Behaviors scale (DDEBS) was developed with the use of a nonclinical population of female undergraduates who engage in disordered eating behaviors. A female population was used because disordered eating behaviors differ between men and women. Men are less likely to engage in typical compensatory behaviors (e.g., self-induced vomiting) and are less likely to restrict food intake than women; this may be because men who engage in disordered eating

behaviors are more concerned with being muscular as opposed to being thin (Weltzin, 2005). Moreover, a sample of college-aged women was used because this population is most at risk for engaging in disordered eating behaviors. Ninety one percent of college women attempt to control their weight through restricting food intake, and 25% of college women engage in bingeing and purging as weight management techniques (Wade, Keski-Rahkonen, & Hudson, 2011).

As aforementioned, a nonclinical population, in this context, refers to individuals who are not currently in treatment for an eating disorder, but engage in at least sub-threshold levels of disordered eating behaviors. The use of a nonclinical population was important for a variety of reasons. First, deliberate denial of disordered eating behaviors is more relevant to nonclinical populations. Research suggests that individuals who are not in treatment but have symptoms of an eating disorder are more reluctant to honestly share their thoughts, feelings, and behaviors with others and are more likely to avoid visits to health care providers (Vandereycken & Humbeek, 2008). Therefore, the use of clinical samples may not be representative of individuals who deny disordered eating behaviors and thus, be underrepresenting denial of disordered eating. Second, the use of a nonclinical population allowed for the separation of researcher and therapist. Participants in clinical settings may not be motivated to report that they have intentionally denied disordered eating behaviors out of fear that their responses to research questions will affect their course of treatment and get back to their therapist (Vitousek, Daly, & Heiser, 1990). Moreover, ensured confidentiality allowed participants to respond honestly without fear that truthful response would elicit intervention. Finally, this scale did not require the participant to acknowledge that intentionally denying a disordered eating behavior is problematic, thereby reducing motivation to lie about their attempts to conceal disordered eating. In clinical settings, the use of face valid items can be problematic, especially when a patient wants to avoid a

diagnosis; however, in the context of a research study, the use of face valid items helped us build a psychometrically valid scale. Development of this scale was not based on clinician intuition, but rather, on the self-report of individuals who engage in disordered eating behaviors. Individuals who engage in disordered eating behaviors are our best resource for understanding phenomena pertaining to eating disorder populations and perhaps we have underestimated their ability to self-report on their behaviors. In fact, Grisso and Appelbaum (1998) found that individuals who engage in disordered eating behaviors were able to accurately report on the facts of an eating disorder.

Studying deliberate denial of disordered eating behaviors might be most useful in regards to prevention and identification of eating disorders in nonclinical populations given that negative consequences of denial may be evidenced in a hesitancy to seek treatment. Only about a third of individuals with eating disorders are treatment seeking and it is likely that denial plays a role in those avoiding treatment (Vandereycken, 2006a). Moreover, the process of hiding disordered eating behaviors and living a life shrouded in secrecy and deceit may exacerbate existing problems. According to the interpersonal formulation of the development of eating disorders, engaging in disordered eating behaviors increases interpersonal problems (e.g., conflict, social isolation, and rejection). In turn, these interpersonal problems are believed to intensify disordered eating behaviors, which ultimately creates a damaging feedback loop (Rieger et al., 2010).

Existing Measures of Denial of Disordered Eating Behaviors

Past attempts at measuring denial of disordered eating behaviors in nonclinical populations have been limited. The only existing measures of denial of disordered eating behaviors in nonclinical populations are Basile's (2004) Self-Disclosure about Body Satisfaction

scale (SDBS) and the Self-Disclosure about Restrained Eating scale (SDRE). The SDBS and SDRE measure disclosure regarding body image and dieting with questions such as, "Do you tell others when you think you are too thin?" and "Do you tell others when you are on a diet?" respectively. However, scoring low on either scale does not necessarily measure denial because not telling someone how you feel about your body or about your dieting behavior is not the same as denying or lying about how you feel about your body or that you are dieting. Furthermore, questions regarding disclosure of eating disorder symptomatology in Basile's scales are limited to "dieting behaviors"; whereas, disordered eating behaviors span beyond dieting (e.g. vomiting, over-exercising, and binge eating) and many individuals with an eating disorder do not think of their eating disorder as a diet.

There has also been one attempt to measure concealment of disordered eating behaviors retrospectively. This untitled retrospective questionnaire surveyed former eating disorder patients at various stages of recovery and asked them questions regarding their most commonly used concealing behaviors at the beginning phase of their eating disorder (Vandereycken & Humbeek, 2008). Although this questionnaire is designed for a clinical population, it can provide insight into the experiences of nonclinical populations because it is directed at the beginning phases of an eating disorder (in some cases, prior to seeking treatment). The questionnaire asks participants to report on concealing behaviors such as avoidance of eating ("to avoid eating with others, I most often said…") and false impression of eating ("to give the impression I had eaten…"). However, a problem with any retrospective survey is that retrospection can be influenced by the current state of an individual. Interestingly, in this study, the longer the retrospection duration period, the less likely individuals were to report concealing behaviors (Vandereycken & Humbeek, 2008). Nonetheless, this retrospective questionnaire provided useful information on

the rates at which individuals that engaged in disordered eating endorsed using specific concealing behaviors. However, a psychometrically validated scale that can reliably measure deliberate denial of disordered eating behavior is still needed. The proposed scale is the first instrument to specifically measure deliberate denial of eating disorder behaviors in a nonclinical population.

CHAPTER II

STUDY 1

Overview

The purpose of Study 1 was to generate items that measure the deliberate denial of disordered eating behaviors. A multistep process was used to accomplish this aim. Stage 1 involved initial item generation. Stage 2 and Stage 3 aimed to refine item content by asking focus groups composed of individuals who engage in disordered eating behaviors (Stage 2) and a panel of eating disorder experts to generate scale items as well as review the existing scale items (Stage 3).

Stage 1 Method and Results

Procedures. Face valid items addressing concealment of and secrecy about eating disorder behaviors within existing measures were first added to the deliberate denial scale (Basile, 2004; Fairburn & Beglin, 1994). Next, items were added based on information from Vandereycken's (2008) retrospective survey, which assessed the frequency at which eating disorder patients used specific concealing behaviors at the beginning phase of their eating disorder. Finally, the researchers created items that they believed assessed the construct of deliberate denial of disordered eating behaviors by combining intentional denial behaviors (concealment, misrepresentation, and omission; Vitousek, Daly, & Heiser, 1990) with both general (e.g., eating habits) and specific (i.e., restricting, binging, and compensatory behaviors) disordered eating behaviors. See Table 1 for a chart depicting initial item generation (i.e., denial behaviors crossed with disordered eating behaviors)

Results. The initial item pool consisted of twenty-eight items that were generated based on the definition of deliberate denial of disordered eating behaviors, existing eating disorder

assessments and questionnaires, and retrospective survey data. The initial item pool resulted in two parts, the first part contained items about general eating habits while the second contained items about specific behaviors. Table 2 shows the DDEBS items at each stage of Study 1; the items generated during this first stage are listed in the Stage 1 column.

Stage 2 Method and Results

Participants. Three focus groups composed of thirteen female undergraduate students (*M*age = 21; *M*BMI = 31.5) generated items independently and reviewed the scale items created in Stage 1. Participants identified as Black (*n* = 6), White (*n* = 4), Other (*n* = 2), and Asian (*n* = 1), and included freshmen (*n* = 5), sophomores (*n* = 4), juniors (*n* = 1), and seniors (*n* = 3). These individuals were undergraduates from a large southeastern university who complete a previous online survey inquiring about their disordered eating behaviors, expressed interest in participating in future research studies, and reported engagement in disordered eating behaviors. Participants were eligible to participate in the focus groups if they indicated engaging in at least one disordered eating behavior (i.e., binge eating, over-exercising, vomiting, laxative use, and/or diuretic misuse) during the previous 28 days, or reported an average EDE-Q score of 2.3 or higher. A cutoff score of 2.3 was used because it has been found to be predictive of eating disorders (including unspecified or other specified eating disorders) in a community sample (Mond, Hay, Rodgers, Owen, & Beumont, 2004).

Procedures. IRB approval was obtained from Old Dominion University prior to conducting the focus groups. Sixty-three eligible participants were contacted via email throughout the recruitment process (see Appendix B for recruitment email). The initial goal was to conduct two focus groups comprised of 6-8 individuals who engaged in disordered eating behaviors. However, due to the number of individuals who did not show up to the first two focus

groups, a third group was held in order to reach the total goal of 12 to 16 participants. The focus group participants were asked to independently generate items that they thought fit with the construct of deliberate denial of disordered eating. After generating items for the scale independently, they were asked to critique the existing scale items using an item review worksheet (see Appendix C). They were asked to rate whether each item was a "good" (i.e., fit the description of the construct given to them) or a "bad" item (i.e., did not fit the construct). They were then asked whether each item they selected as "bad" should be dropped or replaced. Each focus group lasted approximately 45 minutes to one hour and participants received $15 for their time. Items were added, removed, and revised based on feedback from the focus groups (see Appendix A for detailed procedures).

Results. Results of the focus group suggested nearly all items (93%) are face valid, with participants indicating they assess aspects of deliberate denial of disordered eating. Table 3 summarizes the feedback obtained from focus groups. In particular, Table 3 shows the percent of participants who marked each item as "good", as well as recommendations for revisions provided by participants.

All item revisions that came out of the focus groups can be found in the Stage 2 column of Table 2. Based on feedback from the focus group, five items underwent minor revisions (i.e., changes in diction). In three items, examples were added to clarify the question, such as "*How often do you tell people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?*" In the other two items, phrasing was dropped that reportedly made the item confusing, such as dropping furtively in the question, "*How often do you eat in secret (i.e., furtively)?*" Two items were dropped and replaced because over 50% of participants did not understand, or expressed concerns about, these items. The items that were dropped were, "*How*

often are you honest with others if you find it hard to resist food?" and *"How often do you minimize how much you exercise?"* Focus group members generated 9 new items that were added to the scale, these items can be found at the end of Stage 2 in Table 2. In Study 1, items were liberally retained because Study 2 was designed to refine the item set.

Stage 3 Method and Results

Participants. An expert panel composed of five eating disorder researchers and clinicians reviewed the items. These experts were Dr. Carol Peterson, Dr. Scott Crow, Dr. Kelly Berg, Dr. Stephen Wonderlich, and Dr. Emily Pisetsky. Dr. Carol Peterson is an Associate Professor and Research Associate at The University of Minnesota in the Department of Psychiatry. She is a lead researcher at The Minnesota Center for Eating Disorders Research, has a part-time private practice in which she specializes in eating disorders, and is the Chief Training Officer at The Emily Program (a residential eating disorder treatment facility). Dr. Scott Crow is a Professor of Psychiatry at The University of Minnesota and the Director of the Midwest Regional Postdoctoral Training Program in Eating Disorders Research. He is also the Director of the Disordered Eating/Assessment Core of the Minnesota Obesity Center and the Director of Research at The Emily Program. Dr. Kelly Berg is a former Assistant Professor of Psychiatry at The University of Minnesota and currently works for Nike Corporation as a Brand Consultant. She has published extensively on the assessment and diagnosis of eating disorders. Dr. Stephen Wonderlich is a Professor at The University of North Dakota School of Medicine and Health Sciences. He is the Chair of Eating Disorders at Sanford Health (a large medical facility) and the Co-Director of the Sanford Eating Disorders and Weight Management Center. He sat on the Eating Disorder Workgroup for DSM-5 and has published widely on the topic of eating disorders. Dr. Emily Pisetsky is an Assistant Professor of Psychiatry at the University of

Minnesota and Director of Assessment for the Minnesota Center for Eating Disorders Research. Her primary research interests include investigating novel treatment for eating disorders and identifying factors associated with suicide risk in individuals with eating disorders.

Procedures. The revised scale (following the focus groups completed in Stage 2) was emailed to the panel of eating disorder experts and they were asked to provide feedback within two weeks via a web form. Specifically, they were asked to provide feedback on the questionnaire structure, instructions, response scale, item phrasing, and the scale utility. Items were added, removed, and revised based on the feedback from the expert panel. Appendix D describes the expert panel procedures and questions included on the web form.

Results. Table 4 summarizes the feedback from each expert. While each expert had slightly different feedback, common themes arose. Based on the feedback from the expert panel, the two-part structure of the scale was retained. The panel suggested that whether the two-part structure has utility is an empirical question, which was then addressed in Study 2. The response options were changed to clearly reflect that this scale assesses how frequently individuals engaged in disordered eating behavior *secretly* and not just how often they have engaged in a disordered eating behavior. This was accounted for by qualifying the response options (i.e., beneath the response option *rarely* the scale reads, "*in less than 10% of the chances I could have*"). Moreover, response options were changed from a 5-point Likert scale to a 7-point Likert scale in order to increase potential for variability in responses. The item phrasing shared between all items (i.e., "How often have you…") was moved to appear once at the top of the scale, and all item phrasing was changed to be past tense. Overall, the expert panel endorsed the utility of the scale. They confirmed that a similar scale does not exist elsewhere in the research literature and

it possesses construct validity. The scale items resulting from the panel review can be found in the Stage 3 column of Table 2.

Study 1 Discussion

The aim of Study 1 was to ensure that the DDEBS contained face and construct validity by seeking feedback from individuals who engage in (at least) subclinical levels of disordered eating, as well as eating disorder researchers and clinicians. Results from focus group and expert panel feedback suggested that the initial item pool is face valid, the items assess behaviors that individuals who report subclinical levels of disordered eating behavior engage in, and members of the focus group and expert panel endorsed scale utility.

Study 1 produced a two-part scale. The first part of the scale assesses the tendency for individuals to deliberately deny general disordered eating behaviors and the second part of the scale assesses the tendency for individuals to deliberately deny specific disordered eating behaviors. General eating behaviors refer to any behaviors associated with food or eating (e.g., eating at a social event) while specific eating behaviors refer to certain aspects of different eating disorders (e.g., vomiting after a meal). An important distinction between the two parts of the scale is that everyone eats, but not everyone engages in specific disordered eating behaviors. For example, while everyone could answer the question: "How often have you told someone you have eaten when you have not eaten?" if one does not engage in binge eating at all, one cannot answer the question: "How often have you made up excuses so you can be alone to binge eat?" Therefore, the Likert scale for the second half of the scale included a response option that read, "I have not engaged in this behavior over the past month", allowing for distinction between people who report they have not *denied* engaging in these behaviors, as compared to those people who have not engaged in a specific disordered eating behavior at all.

During initial scale development it was realized that the second part of the scale could potentially cause confusion. Therefore, the expert panel was polled as to whether the second half of the scale warranted inclusion. The expert panel voiced that whether the second part of the scale warranted inclusion was an empirical question that they thought was important. Given this feedback, the second part of the scale was retained in Study 1. One of the goals of Study 2 was to examine item statistics and variance explained by items on Part 2 of the scale to determine their utility. It was hypothesized that a multidimensional scale would arise in Study 2 with multiple factors representing denial of general eating behaviors (Part 1) in addition to denial of specific disordered eating behaviors (Part 2).

CHAPTER III

STUDY 2

Method Overview

The purpose of Study 2 was to administer the set of items developed in Study 1 and then to perform an exploratory factor analysis to refine the scale. The refined scale was used to test the initial reliability and validity of the DDEBS.

Participants

In total, 311 undergraduate female students (*M*age = 21.96, *SD* = 6.07) from a large southeastern university met study inclusion criteria and participated in the study. This sample size is consistent with Tinsley and Tinsley's (1987) recommendation of 5 to 10 subjects per item up to 300 subjects. Moreover, Comrey (1988) suggests a sample size of 200 is adequate in most cases of factor analysis that involve less than 40 items; the current scale had 39 items. Inclusion criteria for this study were: (1) self-report of female gender; (2) a mean score above 2.3 on the EDE-Q or engage in a disordered eating behavior (as noted by selecting "*yes*" to at least one of the EDE-Q questions that assess binge eating and compensatory behaviors); see Study 1 Stage 2 for a description of the rationale for these criteria; and (3) self-report that they are not currently in treatment for an eating disorder or have received treatment for an eating disorder in the past. A female sample was used because disordered eating behaviors are prevalent in this population (90% of reported eating disorder cases are women; Sweeting et al., 2015), highlighting the need to assess and understand factors associated with eating disorder development in this population. Research also suggests disordered eating behaviors differ between men and women (Weltzin, 2005). In particular, men are less likely to engage in typical compensatory behaviors (e.g., self-induced vomiting) and are less likely to restrict food intake than women; this may be because

men who engage in disordered eating behaviors are more concerned with being muscular as opposed to being thin (Weltzin, 2005). Therefore, items in this study that assess denial of eating habits out of a desire to be thin (e.g., eating slowly in order to give the impression you are eating more than you are) may not be relevant to male samples. A nonclinical sample in this context, refers to individuals who are not currently in treatment for an eating disorder, but engage in at least sub-threshold levels of disordered eating behaviors (i.e., above a mean score of 2.3 on the EDE-Q or report engaging in at least one disordered eating behavior). The use of a nonclinical sample is important because individuals who are not in treatment but have symptoms of an eating disorder are more likely to deny symptoms, (Vandereycken & Humbeek, 2008).

The sample of 311 women included 94 Black (32%), 161 White (52%), 22 Asian (7%), 6 Indian (2%), and 24 "other" (8%) female undergraduates. The average body mass index (BMI) for the sample was 27.54(SD=6.93), which is considered overweight. In total, 8 women reported being underweight (3%), 134 normal (43%), 77 overweight (25%), and 92 obese (29%; Center for Disease Control and Prevention, 2017).

Measures

Demographics Questionnaire. A demographics questionnaire that assesses age, gender, race, BMI, and current and past mental health treatment was added to the survey.

Deliberate Denial of Disordered Eating Behaviors Scale (DDEBS). The 39-item DDEBS developed in Study 1 measures the tendency for individuals who engage in disordered eating to intentionally deny such behaviors. Response options range from 1 (*never*) to 7 (*everytime*). Four items were reverse scored. Total scores were calculated by taking the mean of all items, with higher scores indicating higher levels of deliberate denial as it pertains to

disordered eating. The purpose of this study was to refine the number of items in the scale, evaluate the facture structure, and examine the initial reliability and validity of this scale.

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). The EDE-Q assesses the frequency of eating disordered thoughts and behaviors. Response options range from 0 (*no days*) to 6 (*everyday*); or 0 (*no*) to 1 (*yes*); or 0 (*not at all*) to 6 (*markedly*) depending on the item. Total scores are calculated by taking the mean of the 23 Likert scale items, with higher scores indicating higher levels of disordered eating behaviors. An example item is, "Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?" A mean score above a 2.3 indicates engagement in at least subclinical levels of disordered eating (Mond, Hay, Rodgers, Owen, & Beumont, 2004). The scale also asks yes/no questions regarding engagement in specific disordered eating behaviors, such as vomiting, over-exercising, binge eating, use of diet pills, use of laxatives, and restricting food intake. Inclusion criteria required participants to score above a 2.3 or endorse engagement in at least one specific disordered eating behavior whereas the mean score was used as part of the validity measures. EDE-Q scores are positively associated with measures of eating concern (r = .68) and shape concern (r = .78), thus demonstrating criterion validity (Mond, Hay, Rodgers, Owen & Beaumont, 2004). The EDE-Q is a reliable measure of eating pathology in female college samples (Rose et al., 2013). Cronbach's alpha for the current sample was .88.

Eating Attitudes Test (EAT-26; Garner et al., 1982). The EAT-26 is a 26-item measure with three subscales: dieting, bulimia, food preoccupation/oral control. Item responses are rated from 1 (*never*) to 6 (*always*). Higher scores indicate greater eating pathology. The EAT-26 has good internal consistency (Cronbach's alpha = .90; Doninger, Enders, & Burnett, 2005) and good test-retest reliability (r = .86; Mazzeo, 1999). The EAT-26 discriminates between

individuals with and without eating disorders (Garner et al., 1983), thus demonstrating construct validity. Cronbach's alpha for the current sample was .89.

Body Shape Questionnaire (BSQ-16; Evans & Dolan, 1993). The BSQ-16 is a 16-item measure used to assess fears of weight gain, desires for weight loss, body dissatisfaction, and low self-esteem due to one's physical appearance. A sample item is, "Has seeing your reflection (e.g., in a mirror or shop window) made you feel bad about your shape?" Response options range from 1 (*never*) to 6 (*always*). Higher scores suggest more weight and shape concerns. It has good internal consistency (Cronbach alpha = .93-.97; Evans & Dolan, 1993). This measure also has adequate convergent validity (r = .58-.81) with other measures of body dissatisfaction (Rosen et al., 1990) and measures of anxiety and depression (r = .41-.53; Evans & Dolan, 1993). The BSQ is strongly related to the Body Dysmorphic Disorder Examination (BDDE) in female undergraduates (r = .77). The BDDE measures feelings of shame and embarrassment about appearance, excessive importance given to appearance, and body checking and avoidance behavior (Rosen, Jones, Ramirez, & Waxman, 1995). Cronbach's alpha for the current sample was .96.

Self Concealment Scale (SCS; Larson & Chastain, 1990). This is a self-report inventory designed to measure a person's general tendency to conceal personal information that is distressing (e.g., "there are lots of things about me that I keep to myself"). The SCS contains 10 items and employs a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) for each item. The total score is derived from the sum of responses to all items, with greater values indicating greater self-concealment. The SCS is a reliable measure of self-concealment in various populations (e.g., adolescent, college-aged, intercultural, gay and lesbian, etc.), with test-retest (over 4 weeks) and inter-item reliability estimates of 0.81 and 0.83, respectively. SCS

scores are positively associated with secret keeping (r = .35) and negatively associated with disclosure (r = -.36) and openness (r = -.47), thus demonstrating convergent and divergent validity (Larson, Chastain, Hoyt & Ayzenberg, 2015). Cronbach's alpha for the current sample was .91.

Distress Disclosure Index (DDI; Kahn & Hessling, 2001) measures comfort with self-disclosure. The DDI is a 12-item scale designed to measure the degree to which a person is comfortable talking with others about personally distressing information. Items are rated on a 5-point Likert-type scale, with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). As the result of a confirmatory factor analysis, Kahn and Hessling (2001) suggested that the 12 DDI items load on a single factor. DDI scores have shown stable test-retest reliabilities across 2- and 3-month periods of .80 and .81, respectively. Internal consistency has been shown to be high across studies, ranging from .92 to .95 (Kahn, Lamb, Champion, Eberle, & Schoen, 2002). The DDI is positively associated with the Self-Disclosure Index (Miller, Berg, & Archer, 1983) and negatively associated with the Self-Concealment Scale (Larson & Chastain, 1990). Convergent validity of self-reported DDI scores is supported by a strong association with self-reports of emotional self-disclosure in response to a specific, unpleasant event (r = .71). DDI scores are not strongly associated with social desirability (r = .12), thus supporting discriminant validity. DDI scores are strongly negatively associated with expressive suppression (r = -.69), thus supporting divergent validity (Kahn, Hucke, Bradley, Glinsky & Malak, 2012). The DDI has been validated in female undergraduate students (Kahn et al., 2012). Cronbach's alpha for the current sample was .92.

Social Desirability Scale (MC SDS; Crowne & Marlow, 1960). This scale is a 33-item self-report measure of social desirability or need for approval. It assesses the more overt forms of

social desirability such as positive impression rather than an unconscious tendency to want to look good. The 33 items are questions describing undesirable behaviors that most everyone engages in (e.g., "I like to gossip at times"). Respondents receive a 1 for failing to endorse an item. Total scores are sums that range from 0 to 33, with higher scores representing higher social desirability or need for approval. The Social Desirability Scale has acceptable internal consistency with coefficient alpha ranging from .73 to .88. The test-retest coefficient over a one-month interval was high with a correlation of .88 (Crowne & Marlowe, 1960). Convergent and discriminant validity was determined by correlating the MC SDS with the Minnesota Multiphasic Personality Inventory (MMPI) validity and clinical scales. MC SDS is positively correlated with the K and the L scales on the MMPI (r = .40 and r = .54 respectively), thus demonstrating convergent validity. The MC SDS is not highly correlated with the MMPI clinical scales (e.g. r = .15 for the Hysteria scale and r = .21 for the Paranoia scale), thus demonstrating discriminant validity. The MC SDS was originally validated in a sample of college students comprised mostly of females (Crowne & Marlowe, 1960). Cronbach's alpha for the current sample was .73.

Eating Behavior Lie Scale. This validity scale was developed by the researcher for the present study in order to detect attempts by respondents to present themselves in a favorable light with respect to their eating behaviors. Given that the DDEBS asks participants to self-report denial, this measure will help ensure participants are responding honestly to the scale. The scale was modeled after the MMPI lie scale. The 10 items include true and false answers to questions describing undesirable eating habits that most everyone engages in (e.g., "I sometimes eat when I am not hungry"). Participants receive a 1 for failing to endorse an item. Total scores are sums that range from 0 to 10, with higher scores representing higher social desirability about eating

habits. It should be noted that this scale has not been formally validated, as it was developed and used for the first time in the present study. Cronbach's alpha for the current sample was .66.

Big-Five Mini-Markers (Saucier, 1994). Saucier's "mini-markers" are a 40 item subset of adjectives derived from Goldberg's (1992) 100 item set of Big Five personality markers (neuroticism, openness to experience, conscientiousness, extraversion, and agreeableness). Forty adjectives are rated on a 9-point scale ranging from 1 (*extremely inaccurate description of oneself*) to 9 (*extremely accurate description of oneself*). The scale results in five mini-markers representative of the Big Five traits. Total scores for mini-markers are calculated by average scores ranging from one to nine with scores above six indicating identification with the personality trait. The mini-markers were significantly and positively correlated with the original full scale (r = .91 to .96), and correlations between the mini-marker scales and the original scale were reduced, thus demonstrating discriminant validity. The mini-markers demonstrated good internal consistency (Cronbach's alpha = .76 to .86; Saucier, 1994). Cronbach's alpha for neuroticism in our sample was .73.

The Suicide Behaviors Questionnaire Revised (SBQ-R; Osman, Bagge, Guitierrez, Konick, Kooper, & Barrios, 2001). The SBQ-R is a 4-item measure that assesses 4 different dimensions of suicidality: lifetime suicide ideation, the frequency of suicide ideation over the past 12 months, the threat of suicide attempt, and self-reported likelihood of suicide ideation in the future. Each item has it's own rating scale. Lifetime suicide ideation is rated on a 4-point scale from 1 (*non-suicidal group*) to 4 (*suicide attempt grou*p). Frequency of suicide ideation is rated on a 5-point scale from 1 (*never*) to 5 (*very often*). Threat of suicide attempt is rated on a 3-point scale from 1 to 3 (with 1 indicating that an individual has never threatened to commit suicide, 2 an individual threatened to commit suicide one time, and 3 an individual threatened to

commit suicide more than one time). Self-reported likelihood of suicidal behavior in the future ranges from 0 (*never)* to 6 (*very likely*). The original SBQ had high internal consistency with alpha ranging from .75 to .80 (Osman, Bagge, Guitierrez, Konick, Kooper, & Barrios, 2001). The SBQ was significantly and negatively associated with the Reasons for Living Inventory (RFL; r = -.34; Linehan et al., 1983; Cotton, Peters, & Range, 1995), thus demonstrating divergent validity. The SBQ was also significantly and positively correlated with the Scale for Suicidal Ideation (SSI; r = .69; Beck et al., 1979; Cotton, Peters, & Range, 1995), thus demonstrating construct validity. The SBQ-R has since been validated in both clinical and non-clinical populations (Osman, Bagge, Guitierrez, Konick, Kooper, & Barrios, 2001). Cronbach's alpha for the current sample was .83.

Deliberate Self-Harm Inventory-Short Version (DSHI-s; Lundh, Karim, & Quilisch, 2007). The DSHI-s is a 16-item simplified self-report questionnaire derived from the Deliberate Self-Harm Inventory (DSHI; Gratz, 2001). It is designed to measure non-fatal forms of deliberate, direct destruction or alteration of body tissue. A sample item is, "have you ever intentionally cut your wrist, arms, or other areas of your body?" Items are rated on a 4-point scale ranging from 1 (*never*) to 4 (*many times*). Total scores were calculated by taking the average of responses. The original DSHI was developed and validated with a sample of 150 undergraduate students (68% female). Results indicated that the DSHI had high internal consistency (Cronbach's alpha = .82) and adequate test-retest reliability (r = .68). The DSHI was moderately, but significantly correlated with other measures of self-harm (r = .35-.49), thus demonstrating construct validity. Frequency of DSHI was also moderately, but significantly correlated with borderline personality organization (a common correlate of self-harm behavior; r = .48), thus demonstrating convergent validity. The DHSI was correlated more highly with

measures of self-harm and borderline personality organization than history of suicide attempts, age, hours employed per week, history of therapy, or social desirability thus demonstrating discriminant validity (Gratz, 2001). Cronbach's alpha for the current sample was .91.

Attention Checks. The survey contained four attention items to ensure participants were reading the questionnaires (e.g., "select 2 for this question").

Procedure

IRB approval for an online survey was obtained from Old Dominion University. Participants were recruited through a cloud-based research system (SONA) to take part in an online survey. Inclusion criteria to take part in the survey required participants to be over the age of 18. Inclusion criteria for analysis (mentioned above) were taken into account post-data collection. The survey consisted of the deliberate denial items produced in Study 1 and the validity measures described above. Participants consented to take part in the survey by reading the consent form online and checking their agreement. All questions were optional, but participants were reminded if questions were left blank. Participants received course credit for completing the online survey.

Given that some of the validity measures inquired about sensitive topics, such as suicidal tendencies and self-harm behaviors, steps were taken to ensure participant safety. First, local and national mental health referral resources were provided in the consent form and at the end of survey information following standards of practice in community-engaged research (e.g., Hill & Pettit, 2012; van Spijker, Batterham, Calear, Farrer, Christensen, Reynolds, & Kerkhof, 2014). It should also be noted that randomized control trials and other empirical data suggest that asking young adult persons about suicide and related topics do not increase feelings of depression or

suicide (e.g., Gould, Marrocco, Kleinman, Thomas, Mostkoff, et al., 2005; Smith, Poindexter, & Cukrowicz, 2010); rather, it alleviates such concerns yielding an improved sense of well-being.

Results and Discussion

Descriptive statistics. The initial data set consisted of 750 responses. Of these, 52 were removed because they were duplicate entries, did not correctly answer at least 3 of 4 attention items (e.g., "select 2 for this question"), or completed the survey very quickly (less than 1/3 of the median duration time). Next, 283 individuals were eliminated who did not meet study inclusion criteria because they scored below a mean score of 2.3 on the EDE-Q, reported that they did not engage in any disordered eating behavior, or reported they were currently in or had received treatment for an eating disorder in the past. The remaining entries consisted of 311 females and 104 males. Given the interest in disordered eating behaviors in female undergraduates, analyses were conducted on data provided by the 311 females.

Scores on the DDEBS were positively skewed, which was expected given that denial of disordered eating behaviors is a low base rate activity. Box plots did not reveal any outliers. A missing values analysis revealed low levels of missingness (no item was missing more than 5 responses – missingness = 1%). Multiple imputation was used to handle any missing data. Descriptive statistics for all measures used in analysis can be found in Table 5 and item statistics for the initial 39 items can be found in Table 9.

Items on Part 2 of the scale were examined in order to determine utility of the two-part approach. On average, over 20% of participants reported that they had not engaged in the specific disordered eating behavior in question over the past month while over 50% of participants reported never engaging in denial of the specific disordered eating behavior in question over the past month. This raises three concerns: (1) 20% of the data on the second half

of the scale needed to be omitted, (2) there is no way to assess whether participants understood how to correctly respond to the questions, and (3) over 70% of respondents selected either not applicable or that they never engage in denial of behavior, creating low variability in responses to these items. While this provides some evidence that the second half of the scale may be inadequate, an EFA was initially run on the full scale to explore utility of the second half of the scale further.

Exploratory factor analysis. Exploratory factor analysis (EFA) was used to evaluate potential multiple factors of the DDEBS. Prior to running analyses, four items were reverse scored and "not applicable" responses to items that assessed specific disordered eating behaviors were recoded as zeros. Initially, it was predicted that the subscales of the DDEBS would be conceptually related; therefore, EFA procedures using oblique rotation were used in order to determine the optimal number of factors (Hendrickson & White, 1964). However, using a correlated factors approach produced a plethora of cross-loading items. It was hypothesized that this cross-loading could be a function of restricted range or two underlying conceptual theories reflected in the scale (i.e., denial of disordered eating versus engagement in specific types of disordered eating—symptoms associated with binge eating disorder, anorexia nervosa, and bulimia nervosa). In accordance with recommendations from Tabachnick and Fidell (2007), the analysis was re-run using an uncorrelated factor approach that expects multiple subscales: orthogonal varimax rotation. For the EFA using varimax rotation, the Kaiser–Meyer–Olkin (KMO) Measure of Sampling value, which examines presence of meaningful relationships among the items, was ideal (KMO = .95). In addition, the Bartlett's Test of Sphericity suggested that the data is factorable, $\chi 2\ (741) = 12{,}539.79$, $p < .001$. Five factors emerged that contained eigenvalues over 1.00 (see Table 10). As expected, the factors aligned with the two conceptual

theories previously described. The first factor appears to measure deliberate denial of general disordered eating behaviors while the second, third, fourth, and fifth factors seem to measure denial of symptoms associated with the three most common types of eating disorders: binge eating disorder (BED), anorexia nervosa (AN), and bulimia nervosa (BN). Factor loadings for the initial 39-item scale EFA can be found in Table 6.

After review of the item-level descriptive statistics and EFA results above, it was decided to re-run the EFA using only the items from Part 1 of the scale. This decision was made for a variety of reasons. As mentioned previously, on average, over 20% of participants reported that they had not engaged in the specific disordered eating behavior in question over the past month while over 50% of participants reported never engaging in denial of the specific disordered eating behavior in question over the past month. This raises three concerns described in Descriptive Statistics section above. Lastly, inspection of the scree plot (see Figure 1) and review of total variance revealed that the first factor – which was primarily made up of items from Part 1 of the scale – explained almost 50% of scale variance.

Part 1 of the scale initially contained 18 items. An EFA was conducted on these items utilizing an approach that expects a unidimensional scale: Quartimax roatation. For the EFA using Quartimax rotation (KMO=.96, Bartlett's Test of Sphericity: $\chi^2(136) = 5{,}430.40$, $p < .001$), two factors emerged that contained eigenvalues over 1.00 (see Table 11). These two factors accounted for 72% of the variance in the scale, with the first factor accounting for 64% and the second factor accounting for 8% (see Figure 2). Factor loadings for the Part 1 EFA can be found in Table 7. One reverse coded item ("*How often have you openly talked to someone you are close to about your eating habits?*") did not load onto any factor and this item was subsequently dropped from the scale. The remaining items all contained factor loadings above .40 and were

therefore retained in congruence with prior studies of scale development in the eating disorder literature (Forbush et al., 2013).

Review of items. Results of the EFA using Part 1 of the scale produced 17 items that loaded on one of the two factors. However, some of these items were redundant with one another. Therefore, a 12-item scale was developed with a goal of reducing redundancy while maintaining strong reliability and validity. In addition, a 4-item version of the scale was developed as a screening measure. Item total-correlations for each version of the scale and Cronbach's alpha for each version can be found in Tables 13 and 14 respectively. All versions of the scale can be found in Table 12.

12-item scale (DDEBS-12). Many of the items were intentionally made to be redundant with one another with the idea that the most appropriate item wording should be decided empirically. These items were the first to be reviewed. Items 6, 7, and 8 asked participants to report how often they had been dishonest about what they ate, how much they ate, and how frequently they ate respectively. The redundancy of these items was confirmed by inter-item correlations above .86 and similar factor loadings between .804 and .830. It was decided to retain item 7 (*How often have you been dishonest about how much you ate?*) because it had the highest factor loading. Items 1, 2, and 5 asked participants to report how often they have told someone they have not eaten when they have eaten, they were going to eat later in order to avoid eating, and they were not hungry when they were. The three items contained similar factor loading between .722 and .727. However, only items 1 and 2 had a high inter-item correlation. This might be because items 1 and 2 asked directly about the act of eating whereas item 3 assessed denial of hunger. Item 2 was dropped because it had a lower factor loading than item 1 and was endorsed less frequently. Items 10 and 11 asked participants to report how often they spread food

around on their plate to give others the impression that they were eating more than they were and how often they ate slowly in order to give others the impression they were eating more than they were. These two items had inter-item correlations of .867 and similar factor loadings. Item 10 was dropped because it had a lower factor loading and was less frequently endorsed. In addition, focus group members also provided feedback that item 10 was a not a well-known or common behavior (see Table 3). Items 12 and 13 asked participants to report how often they quickly cleared their plate in order to hide how much food they ate or how much food they did not eat. While these two questions were worded as inverses of one another, they appear to measure the same thing as indicated by an inter-item correlation of .795 and similar factor loadings. Item 13 was dropped because it was the least frequently endorsed item of all 17-items.

A third Quartimax EFA was conducted on the 12-item scale (KMO=.94, Bartlett's Test of Sphericity: $\chi^2(66) = 2{,}823.49$, $p < .001$) and a single factor emerged (loading range=.64-.88, eigenvalue=7.41) that accounted for 62% of the variance in the scale (see Figure 3).

17-item versus 12-item. Both versions of the scale had strong reliability and contained item-total correlations above .40 (see Tables 13 and 14). Descriptive statistics for the scale versions suggested that as the scale became shorter the items composing the scale were more frequently endorsed and skewness and kurtosis decreased (see Table 15). Moreover, as the scale became shorter there were no changes in correlations between the DDEBS-12 and measures of validity. Given these findings, the 12-item scale was ultimately retained because it was deemed useful to eliminate the five redundant items for scale clarity and usability. However, beyond redundancy, no other items proved problematic and their elimination would only contribute to loss of variance explained. It is expected that this 12-items scale will most frequently be used for research purposes. Therefore, a shorter unidimensional scale is generally preferred.

4-item screening questionnaire (DDEBS-4). The most frequently endorsed items were retained in a short 4-item version of the scale. This four-item scale may prove useful as a screening questionnaire. Screening questionnaire are often brief measures that can be administered by clinicians as part of routine clinical visit or a research agenda to identify individuals at potentially high risk for a specific condition or, in this case, engagement in certain behaviors. It may also be used to monitor treatment progress, outcomes, or changes in symptoms over time (American Psychological Association, 2014).

Reliability. The internal consistency of the DDEBS was determined by calculating Cronbach's alpha for the items that make up the DDEBS-12 retained on the first factor. The Cronbach's alpha for our sample was .94 indicating strong internal consistency (Nunnally, 1978). The DDEBS-4 screening questionnaire had an alpha of .878.

Validity. All correlations between the DDEBS-12 and measures of validity can be found in Table 16. Convergent validity of the proposed scale was supported by a significant positive correlation with the Self Concealment Scale (SCS; $r = .296$, $p < .01$; Larson & Chastain, 1990) and a significant negative correlation with the Distress Disclosure Index (DDI; $r = -.278$, $p < .01$; Kahn & Hessling, 2001). Significant positive correlations between the DDEBS-12 with the Eating Disorder Examination Questionnaire ($r = .466$, $p < .01$; EDE-Q; Fairburn & Beglin, 1994), the Eating Attitudes Test ($r = .484$, $p < .01$; EAT-26; Garner et al., 1982), and the Body Shape Questionnaire ($r = .557$, $p < .01$; BSQ; Evans & Dolan, 1993) indicated criterion validity. These correlations are strong enough to support criterion validity, but also indicate that the DDEBS-12 measures a construct beyond disordered eating and body dissatisfaction. It was anticipated that a significant positive correlation between the DDEBS-12 and the "mini marker" neuroticism (Saucier, 1994), would indicate construct validity, as neuroticism is a well-

established correlate of disordered eating (Cervera et al., 2003). However, this relationship was not found (r = .104, p > .05). Interestingly, neuroticism was associated with other measures of disordered eating such as the EAT and EDEQ (ps < .01), which may suggest that neuroticism is associated with disordered eating but not denial of such behaviors.

A non-significant correlation between Crowne and Marlowe's (1960) measure of social desirability and the DDEBS-12 suggested that the Social Desirability Scale is an adequate measure of discriminant validity (r = -.084, p > .05).

The researcher created an eating behavior lie scale modeled after the MMPI lie scale in order to assess the tendency for individuals to respond to questions about eating behaviors in a socially desirable way. Using the MMPI as a model, those who scored above a 2 would be considered invalid. A total of 62 participants (20%) scored above a two on the eating behavior lie scale developed for this study (see Figure 4). Figure 4 shows the frequency of eating behavior lie scale total scores for the sample. Given that the DDEBS asks individuals to honestly report on behaviors that they typically deny, the eating behavior lie scale was used to assess valid responses. Therefore, the EFA was re-run on the 12-item scale with these 62 individuals removed. Results did not significantly change (KMO=.94, Bartlett's Test of Sphericity: $\chi^2(66)$ =2,342.29, p <.001) and a single factor still emerged (loading range=.57-.88, eigenvalue=7.43) that accounted for 62% of the scale variance. In addition, individuals who scored above a 2 on the eating behaviors lie scale were compared to those who scored below on self-reports of disordered eating, body dissatisfaction, and denial of disordered eating behaviors. Those who scored above a 2 on the eating behavior lie scale reported less disordered eating, body dissatisfaction, and denial of disordered eating, but the differences were not significant (ps > .05).

This study also looked at whether deliberate denial of disordered eating behaviors is associated with serious negative outcomes. Findings suggest that the denial of disordered eating behaviors is associated with self-harm and suicidal tendencies as indicated by significant positive correlations with the Suicidal Behaviors Questionnaire Revised (SBQ-R; $r = .319$, $p < .01$) and the Deliberate Self-Harm Inventory (DSHI; $r = .382$, $p < .01$; Osman et al. 2001; Gratz, 2001).

CHAPTER IV

GENERAL DISCUSSION

The aim of this study was twofold: (1) to develop a self-report scale that assesses the tendency for individuals who engage in disordered eating behaviors to intentionally deny those behaviors, and (2) to provide initial evidence of its reliability and validity. In Study 1, items were generated using a multistep process. Items were initially generated based on existing measures of disordered eating, qualitative research studies, and a predetermined definition of deliberate denial of disordered eating behaviors (i.e., any conscious omission, concealment, or misrepresentation of behavior related to disordered eating). Item content was expanded and refined through the use of focus groups and an expert panel. In Study 2, the scale was empirically examined through an exploratory factor analysis. The final 12-item scale was used to examine initial evidence of reliability and validity.

Initially, five factors of the scale emerged consistent with two constructs being measured: (1) denial of general disordered eating behaviors and (2) engagement in symptoms associated with the three most common types of eating disorders: binge eating disorder (BED), anorexia nervosa (AN), and bulimia nervosa (BN). The first part of the scale was retained in order to have a unidimensional scale that places a specific focus on assessing denial of general disordered eating behaviors. Moreover, by only using Part 1 of the scale, confusion around allowing participants to select a "not applicable" option in assessment of specific disordered eating behaviors was eliminated. The first half of the scale initially contained 18 items; however, a 12-item version was ultimately retained. The 12-item version reduced redundancy while retaining enough items to capture various aspects of denial. The proposed scale is a 12-item

unidimensional scale that assesses a tendency to conceal general disordered eating behaviors, making it broadly applicable to both researchers and clinicians.

In addition, a 4-item version of the scale was developed as a screening measure. The DDEBS-4 contained the most frequently endorsed items. Screeners are often brief questionnaires that can be administered by clinicians as part of routine clinical visit or a research agenda to identify individuals at potentially high risk for a specific condition or, in this case, engagement in certain behaviors. It may also be used to monitor treatment progress, outcomes, or changes in symptoms over time (American Psychological Association, 2014).

Reliability and Validity

Results from the two studies suggest that the DDEBS is both reliable and valid. The 12-item scale possessed strong internal consistency with an alpha of .94 while the screener contained an alpha of .88, suggesting the items retained produce similar scores. There was also evidence for the criterion, convergent, and discriminant validity of both the 12-item scale and the 4-item screener. Both scales were positively associated with measures of disordered eating (EDE-Q and EAT-26; Fairburn & Beglin, 1994; Garner et al., 1982) and body dissatisfaction (BSQ-16; Evans & Dolan, 1993), thus demonstrating criterion validity. In this case, criterion validity refers to a comparison between the DDEBS and a concurrent expected outcome (i.e., disordered eating and body dissatisfaction). The EDE-Q and EAT-26 are gold standards for assessing engagement in disordered eating while the BSQ-16 is the most frequently used self-report assessment of body dissatisfaction (Brunet, 2005). The scales were positively associated with the Self-Concealment Scale (SCS; Larson & Chastain, 1990) and negatively associated with the Distress Disclosure Index (DD1; Kahn & Hessling, 2001), thus demonstrating convergent validity (i.e., correlations between measures that are theoretically related). The SCS measures a

person's general tendency to conceal personal information that is distressing while the DDI measures comfort with self-disclosure. It then follows that denying disordered eating behaviors (i.e., concealment of an oftentimes distressing behavior; Vandereycken, 2006a) would be associated with concealment of distressing behaviors broadly and a discomfort with self-disclosure.

The scales were not associated with Crowne and Marlowe's (1960) measure of social desirability. A non-existent association demonstrates that responses to the DDEBS are not related to a desire to be perceived in a socially desirable light, thus demonstrating discriminant validity (i.e., confirming that these two divergent conceptual theories are not related).

As previously mentioned, the researcher created an eating behavior lie scale modeled after the MMPI lie scale in order to assess valid responses. The eating behavior lie scale suggested that the majority (80%) of responses were valid and results of the EFA do not change whether or not responses are eliminated based on eat lie responses. It is understood that concerns may arise about the ability of participants to respond honestly to the DDEBS given that the scale asks individuals to report on behaviors that they typically deny. However, there is reason to believe individuals who deny their disordered eating behavior can accurately report on this behavior. First, this scale asks about deliberate denial (i.e., conscious and intentional denial) as opposed to unintentional denial (i.e., impaired self-awareness, lack of knowledge). Second, many questionnaires ask individuals to report on behaviors they may not honestly discuss in other settings. For example, research suggests that while many individuals will not discuss suicidal ideation in face-to-face interactions they will report suicidal thoughts and tendencies in anonymous questionnaires (Warner et al., 2011). Third, participants are guaranteed confidentiality in both research and clinical settings, assuring participants that they can respond

honestly without fear that truthful response will elicit intervention. Lastly, the shame and stigmatization that likely motivates denial is less of a threat in the context of a self-report questionnaire (Vandereycken, 2006a).

Implications

Theoretical implications. The theoretical implications of deliberate denial of disordered eating behaviors may best be understood through an interpersonal formulation of eating disorders. According to the interpersonal formulation of the development of eating disorders, engaging in disordered eating behaviors increases interpersonal problems; in turn, these interpersonal problems are believed to intensify eating disorder symptoms (Rieger et al., 2010). Deliberate denial may have important interpersonal consequences because those close to an individual who deliberately denies disordered eating behaviors may feel manipulated and deceived. Using the interpersonal formulation, there is reason to believe that individuals who engage in disordered eating behaviors are motivated to lie about their behaviors, and that lying increases interpersonal problems and disordered eating. Disordered eating behaviors are associated with an increased fear of negative evaluation (Atlas, 2004; Hinrichsen, Wright, Waller, & Meyer, 2003). Consequently, fear of negative evaluation is a motivating factor for intentionally concealing disordered eating behaviors (Petterson et al., 2008; Vandereycken, 2006a). Individuals who lie tend to experience more negative social interactions, and subsequently, negative social interactions predict increases in eating pathology (DePaulo, Kashy, Kirkendol, Wyer & Epstein, 1996; Howard, Gauvin, Jabalpurwala, Sequin, & Stotland, 1999). The DDEBS-12 might assist in validating this theory, which will be discussed in further detail under future directions.

Interpersonal consequences related to deliberate denial might extend beyond increases in disordered eating. Deliberate denial of disordered eating behaviors may provide insight into why individuals with eating disorders are at a heightened risk for suicide and self-harm (Crow et al., 2009). This study confirmed that denial of disordered eating behaviors is associated with self-harm and suicidal tendencies as indicated by significant positive correlations with the Suicidal Behaviors Questionnaire Revised (SBQ-R) and the Deliberate Self-Harm Inventory (DSHI; Osman et al. 2001; Gratz, 2001). The interpersonal theory of suicide (IPTS) suggests that individuals are at a heightened risk for suicide when three factors are present: low belonging, high perceived burdensomeness, and acquired capability for suicide (Joiner, 2005). Past research has suggested that painful or provocative behaviors (i.e., self-harm behaviors) such as bingeing or starvation (i.e., disordered eating behaviors) are associated with acquired capability of suicide (Selby et al., 2010). Less is known about how disordered eating behaviors might be associated with low belonging and high perceived burdensomeness; however, Dodd, Smith, and Boddell (2014) demonstrated an association between disordered eating behaviors and stress generation (i.e., actively generating stress in one's life), which in turn predicted low belonging and high perceived burdensomeness. Deliberate denial of disordered eating behaviors may be a way in which individuals who engage in disordered eating behaviors create stress in their life or inadvertently exacerbate feelings of low belonging. Lying about disordered eating behaviors may create conflict with peers, and the stress associated with lying may even motivate individuals to isolate themselves from social supports.

Research implications. A psychometrically valid scale that objectively measures the deliberate denial of eating disorder behaviors can be empirically used to test the aforementioned theoretical implications and the impact deliberate denial has on interpersonal relationships,

eating disorder symptoms, and help seeking behavior. Lack of self-disclosure (i.e., the degree to which individuals share their deepest thoughts and feelings with others) and high self-concealment (i.e., the tendency to keep distressing and potentially embarrassing personal information from others) are two factors related to denial and have been linked to increases in disordered eating in nonclinical populations (Basile, 2004; Masuda & Latzman, 2012). Basile (2004) found that there is an inverse relationship between self-disclosure about body feelings and body dissatisfaction as well as an inverse relationship between general self-disclosure and extreme weight control behaviors. This suggests that sharing thoughts and feelings with others may protect individuals from experiencing negative feelings about their body and practicing maladaptive dieting behaviors. Masuda and Latzman (2012) also found an association between self-concealment and dieting behaviors in college women, which supports Basile's work by showing that the tendency to keep personal information to oneself is related to engagement in dieting.

The DDEBS-12 might also be used in research contexts to determine whether denial plays a role in treatment avoidance and/or adherence. The scale could be used to investigate whether individuals who deny disordered eating are less likely to seek treatment, stay in treatment, and/or benefit from treatment. It is possible that individuals who deny disordered eating do so, in part, to avoid intervention from others. This scale could be used in longitudinal studies to determine how denial of disordered eating behaviors specifically relates to increases in or maintenance of symptoms related to eating disorder development as well as help-seeking behaviors over time.

Clinical implications. Identifying the role denial of disordered eating behaviors plays in the onset and maintenance of disordered eating behaviors could aid in identification, prevention, and intervention efforts.

Identification and prevention. Based on previous research, when patients with eating disorders were asked retrospectively what would have made them realize sooner they had an eating disorder or be ready for help, over half said that having a health care professional who was familiar with eating disorders would have helped (Vandereycken & Humbeeck, 2008). Many health care professionals meet denial with confrontation. This strategy often yields defensiveness and leaves the patient feeling misunderstood and unwilling to seek further treatment (Vandereycken, 2006b). In order to support and empathize with individuals who deliberately deny disordered eating behaviors we need to educate clinicians on the causes and consequences of deliberate denial of disordered eating behavior. For example, if it is widely understood that deliberate denial is most often related to shame, a helping professional might try to normalize a patient's behavior before asking them about it, allowing clinicians to identify engagement in disordered eating more often.

There may also be an opportunity to use the 4-item version of the scale as a screening measure (i.e., to flag individuals at high risk for engagement in denial). The DDEBS-4 could be used to determine rates of deliberate denial of disordered eating behaviors in educational (e.g., college, high school) or healthcare settings (e.g., primary care). If high rates of denial were detected in educational settings or an individual endorsed one or more item in a healthcare setting, further action might be taken in order to encourage these individuals to confide in someone or seek treatment. For example, outreach events put on by college counseling centers

might emphasize the importance of confiding in a trusted friend or family member about engagement in disordered eating behaviors

Treatment. Past research on denial in clinical populations has yielded conflicting results regarding the clinical significance of denying disordered eating behaviors in treatment settings (Couturier & Lock, 2006; Pryor, Johnson, & Wiederman, 1995). However, this research has been limited to studies with individuals with AN, and further limited by the lack of a validated assessment measures. The DDEBS-12 could potentially be used as part of an intake (i.e., initial treatment evaluation) in order to determine whether a client engages in denial, how often they engage in denial, and what kinds of denial they engage in. This information may then be used within the context of therapy (i.e., "What are the costs and benefits of denial?"; "How does denial serve you?"; "What would it be like to be honest with others about your disordered eating?"). It is possible that exploring denial may even lead to treatment interventions that contain an honesty component. Pending future research on the role of deliberate denial in the onset and maintenance of eating disorders, internet-based interventions such as *Student Bodies* might incorporate modules about the importance of honesty or finding a trusted confidant. *Student Bodies* is an internet-based intervention that has successfully reduced weight/shape concerns and prevented eating disorders in high-risk college women (Dev, Winzelberg, Celio, & Taylor, 1999).

Strengths and Limitations

To our knowledge, this is the first study that has attempted to build a psychometrically valid scale that assesses denial of disordered eating behaviors. The results of the study produced a brief, unideminsional, reliable, and valid self-report scale that is easy to use. This study was conducted with a large, diverse sample of college women. Although the goal of this study was to

survey a diverse sample of college women (a population at high risk for engaging in disordered eating behaviors; Walker et al., 2015), these findings cannot be generalized to clinical populations, older women, non-college populations, men, and other races besides Black and White.

It is unclear whether this scale could be used with men and older populations of women. The majority of reported eating disorder cases are young women (95% between the age of 12 and 25, and 90% female; Sweeting et al., 2015). However, this does not mean that eating disorders do not impact men and older populations of women. In fact, men may be less likely to report disordered eating because of the stigma associated with disordered eating as a female disease, making denial particularly relevant for this population. Similarly, older women who engage in disordered eating behaviors may have secretly engaged in disordered eating for many years without seeking treatment, also making them more likely to deny symptomatology (Dennis, 2016). Although it is hypothesized that this scale would be applicable to non-college samples and races other than Black and White, this should be determined empirically.

Future Directions

Future research should attempt to replicate these findings with various populations as well as verify the psychometric results using confirmatory factor analysis with a separate sample of 250-300 college women. While denial is likely relevant to other populations, such as men, the content of the scale may need to change. For example, current items related to dietary restriction (e.g., “How often have you deliberately hid food in order to give the impression you ate more than you did?”) may not be as applicable to men, while other items may need to be added in a male version that assess denial of disordered eating behaviors related to attaining muscle mass (e.g., steroid use). Future research will also need to specifically examine whether the factor

structure holds in community samples, older women, men, clinical samples, and races other than Black and White.

The DDEBS-12 could also be used to determine how denial of disordered eating behaviors impacts eating disorder development, interpersonal relationships, help seeking behaviors, suicidal ideation, and self-harm tendencies. Longitudinal designs might investigate whether denial of disordered eating behaviors (as measured by the proposed scale) predicts increases in disordered eating, suicidal ideation, self-harm tendencies, and treatment avoidance at subsequent time points, and whether these maladaptive outcomes are mediated by interpersonal challenges, such as increased conflict. The DDEBS-12 should also be used in experimental designs to determine whether interventions that encourage honesty reduce scores on the proposed scale and, in turn, whether these decreases lead to positive outcomes (i.e., decreases in disordered eating, body dissatisfaction, and suicide/self-harm tendencies; and increases in help-seeking behaviors).

CHAPTER V

CONCLUSIONS

This study provided evidence that the Deliberate Denial of Disordered Eating Behaviors scale is a reliable and valid measure of deliberate denial pertaining to disordered eating behaviors. The scale possessed a strong internal consistency; and adequate measures of content validity, criterion validity, face validity, convergent validity, and discriminant validity. Collectively, results from this preliminary investigation indicated that the DDEBS showed reasonable psychometric qualities. There are currently no other scales available comparable to this one. It is a short scale that can be completed quickly and easily. It is the hope that this scale will be used to determine the role deliberate denial of disordered eating behaviors plays in the onset and maintenance of eating disorders, and ultimately prove useful for informing identification, prevention, and treatment efforts.

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Table 1

Initial Item Generation Chart

General Eating Behavior Items (Part 1)

	General Eating Habits	
Concealment/Omission	How often do eat in secret?	How often do you deliberately hide food (e.g., in a napkin) in order to give the impression you have eaten more than you have?
	How often do you quickly clear your plate in order to hide how much food you have or have not eaten?	How often do you spread food around on your plate in order to give others the impression you have eaten more than you have?
		How often do you eat slowly in order to give the impression you are eating more than you are?
Misrepresentation	How often do you tell people you have eaten when you have not eaten?	How often do you eat more or less food than you lead others to believe?
	How often are you dishonest about what you eat?	How often do you make up excuses to avoid events where you know food will be served?
	How often do you tell people you are going to eat later in order to avoid eating?	How often do you tell people you feel sick in order to avoid eating?
	How often do you tell people you are not hungry when you are?	How often do you tell people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods.
Admit (reverse)	How often do you openly talk about your eating habits with someone you are close to?	

Specific Disordered Eating Behavior Items (Part 2)

	Overeat ("binge" eat)	Loss of Control of Eating	Compensatory (in general)	Dieting/restricting	Exercise	Diet pills/laxatives
Concealment/Omission	How often do you **binge eat** in secret? How often do you hide food to **binge** on?	How often do you hide from others that you sometimes lose control over your eating?	How often do you hide doing things such as over-exercising, vomiting after you eat, or taking laxatives or diet pills?	How often do you intentionally hide **dieting (**e.g., follow food rules, intentionally eat less than your normally would) from others?	How often do you **exercise** in secret?	How often do you hide **diet pills** and/or **laxatives**?
Misrepresentation	How often are you dishonest about **binge eating**? How often have you made up excuses so you can be alone to binge eat (i.e., eating a large amount of food in a short amount of time)?	How often are you dishonest about losing control over your eating?		How often are you dishonest about **dieting**? How often do you make up excuses to **skip meals or snacks**?	How often do you spend more time **exercising** than you lead others to believe? How often do you make up excuses so no one will know you are **exercising**?	How often are you dishonest about using **diet pills** and/or **laxatives**?
Admit (Reverse)	How often do you admit to someone you trust that you **binge eat**, or eat a large amount of food in a short amount of time?	How often do you admit to someone you trust that sometimes when you eat you feel out of control?	How often do you admit to someone you trust that you do things such as over-exercise, vomit after you eat, or take laxatives or diet pills?	How often have you admitted to someone you trust that you diet **(**e.g., follow food rules, intentionally eat less than your normally would)?		

Table 2

Items and Revisions to item content by study Stage

Stage 1	*Stage 2*	*Stage 3*
How often do you…	*How often do you…*	*How often have you…*
Part 1	**Part 1**	**Part 1**
Tell people you have eaten when you have not?	Tell people you have eaten when you have not?	**Told people you have eaten when you have not eaten?[1]**
Tell people you are not hungry when you are?	Tell people you are not hungry when you are?	Told people you are not hungry when you are?
Tell people you have dietary restrictions in order to avoid eating certain foods?	**Tell people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?[2]**	Told people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?
Tell people your feel sick in order to avoid eating?	Tell people you feel sick in order to avoid eating?	Told people you felt sick in order to avoid eating?
Lie about what you eat?	Lie about what you eat?	**Been dishonest about what you ate?[3]**
Eat in secret (i.e., furtively)?	**Eat in secret?[4]**	Eaten in secret?
Spread food around on your plate in order to give others the impression you have eaten more than you have?	Spread food around on your plate in order to give others the impression you have eaten more than you have?	Spread food around on your plate in order to give others the impression you have eaten more than you have?
Eat slowly in order to give the impression you are eating more than you are?	Eat slowly in order to give the impression you are eating more than you are?	Eaten slowly in order to give the impression you are eating more than you are?
Deliberately hide food in order to give the impression you have eaten more than you have?	**Deliberately hide food (e.g., in a napkin) in order to give the impression you have eaten more than you have?[2]**	Deliberately hid food (e.g., in a napkin) in order to give the impression you have eaten more than you have?
Part 2	**Part 2**	**Part 2**
Hide engaging in compensatory behaviors (e.g. over-exercising, vomiting, and/or taking laxatives or diet pills)?	Hide engaging in compensatory behaviors (e.g. over-exercising, vomiting, and/or taking laxatives or diet pills)?	**Hid doing things such as over-exercising, vomiting, and/or taking laxatives or diet pills?[5]**
Lie about bingeing?	Lie about bingeing?	**Been dishonest about binge eating?[3,6]**
Binge in secret?	Binge in secret?	**Binge eaten in secret?[6]**
Try to hide being on a diet from others?	**Intentionally hide dieting from others?[7]**	**Intentionally hid dieting (e.g., follow food rules, intentionally eat less than you normally would) from others?[2]**

Lie about dieting?	Lie about dieting?	**Been dishonest about dieting?[3]**
Exercise in secret?	Exercise in secret?	Exercised in secret?
Make up stories so no one will know you are exercising?	Make up stories so no one will know you are exercising?	**Made up excuses so no one will know you are exercising?[8]**
Lie about using diet pills/laxatives?	Lie about using diet pills/laxatives?	**Been dishonest about using diet pills/laxatives?[3]**
Make up stories to hide the fact that you threw up after eating?	Make up stories to hide the fact that you threw up after eating?	**Made up stories or excuses to hide the fact that you vomited after eating?[8,9]**
Lie about purging?	Lie about purging?	**Been dishonest about vomiting after eating (i.e., making yourself sick after eating)?[2,3,9]**
Make up excuses to avoid social events where you know food will be served?	**Make up excuses to avoid events where you know food will be served?[10]**	Made up excuses to avoid events where you know food will be served?
Make up stories so you can be alone to binge?	**Make up stories so you can be alone to binge (i.e., eating large amounts of food in a short amount of time)?[2]**	**Made up excuses so you can be alone to binge (i.e., eating large amounts of food in a short amount of time)?[8]**
Honest with others if you find it hard to resist food?*	**Openly discuss your eating habits with someone you are close to?*,[11]**	Openly talked about your eating habits with someone you are close to?*
Make up excuses to avoid events where people might see your body (e.g., avoid going to the beach)?	**Make up excuses to avoid events where people might see your body (e.g., avoid going to the beach)?[12]**	
Minimize how much you exercise?	**Tell others that you spend less time exercising than you actually do?[11]**	Spent more time exercising than you lead others to believe?[7]
Quickly clear your plate in order to hide how much you have or have not eaten?	Quickly clear your plate in order to hide how much you have or have not eaten?	**Quickly cleared your plate in order to hide how much you have eaten?[13]**
		Quickly cleared your plate in order to hide how much you have not eaten?[13]
Lie about exercising?	**Lie about exercising?[14]**	
Hide diet pills and/or laxatives?	**Hide diet pills and/or laxatives?[15]**	
Make up excuses to go to the bathroom after eating so you can purge?	**Make up excuses to go to the bathroom after eating so you can purge?[15]**	
	Lie about how much you eat?[16]	**Been dishonest about how much you ate?[3]**

Lie about how frequently you eat?[1,6]	**Been dishonest about how frequently you ate?[3]**
Eat more or less food than you lead others to believe?[16]	**Eaten more food than you lead others to believe?[13]**
	Eaten less food than you lead others to believe?[13]
Admit to someone you trust that you engage in disordered eating behaviors (e.g., bingeing, over-exercising, vomiting, and/or taking laxatives or diet pills)?[*,16]	**Admitted to someone you trust that you binge eat or eat large amounts of food in a short amount of time?[*,13]**
Tell people you are going to eat later in order to avoid eating with others?[16]	**Told people you are going to eat later in order avoid to eating?[17]**
Hide food to binge on?[16]	Hid food to binge on?
Make up excuses to skip meals?[16]	**Made up excuses to skip meals or snacks?[19]**
Eat prior to a meal to in order to conceal how much you are eating around others?[16,18]	
Make up excuses to avoid events where you know dinner will be served?[15,16]	
	Admitted to someone you trust that you do things such as over-exercising, vomiting after you eat, and/or taking laxatives or diet pills?[*,13]
	Hid bingeing or eating large amounts of food in a short amount of time?[20]
	Admitted to someone you trust that you diet (e.g., follow food rules, intentionally eat less than you normally would)?[*,20]
	Hid from others that you sometimes lose control over your eating?[20]
	Admitted to someone you trust that when you eat you sometimes feel out of control?[*,20]
	Been dishonest about feeling a loss

	of control over your eating?[20]

*reverse code

All revisions based on feedback

1 = added "have note eaten" at the end for clarity
2 = added example(s) for clarification
3 = changed to "been dishonest" as to not make the scale feel accusatory
4 = deleted "furtively" due to lack of knowledge regarding definition
5 = deleted "compensatory behaviors" to reduce confusion
6 = clarified "bingeing" as "binge eating"
7 = clarified intention and streamlined wording
8 = changed "stories" to "excuses" (or added excuses) for consistent wording and to clarify question intention
9 = changed "threw up" and "purge" to "vomiting" for consistent wording
10 = dropped "social" in order to ensure we are assessing deceit around disordered eating as opposed to social anxiety
11 = dropped and replaced item from previous stage due to lack of clarity
12 = dropped item as feedback suggested this item assesses deceit due to body dissatisfaction as opposed to disordered eating
13 = split question in order to assist with accurate interpretation
14 = dropped due to difficulty in interpreting direction of response (i.e., more or less exercise)
15 = dropped due to redundancy with another item
16 = added from focus group item generation
17 = dropped "with others" to account for the fact that some people may be avoiding eating all together (not necessarily just with others)
18 = dropped item due to low probability
19 = added "snacks" to make question more comprehensive
20 = added from expert panel item generation

Table 3

Summary of focus group feedback

Item	Percent of participants that marked item as face valid	Suggestions for Revisions
1. How often do you tell people you have eaten when you have not?	100%	
2. How often do you make up excuses to avoid social events where you know food will be served?	85%	*Clarify that this is a place where you will have to eat (e.g., dinner)*
3. How often are you honest with others if you find it hard to resist food? (reverse code)	31%	*How often do you tell others…* *How often do you admit…*
4. How often do you tell people you are not hungry when you are?	92%	
5. How often do you tell people you have dietary restrictions in order to avoid eating certain foods?	85%	*Provide examples, such as gluten free*
6. How often do you tell people you feel sick in order to avoid eating?	100%	
7. How often do you lie about what you eat?	92%	*Add how much or how often*
8. How often do you eat in secret (i.e. furtively)?	100%	
9. How often do you spread food around on your plate in order to give others the impression you have eaten more than you have?	77%	*This is not a common behavior*
10. How often do you make up excuses to avoid events where people might see your body (for example, avoid going to the	85%	

beach)?		
11. How often do you eat slowly in order to give the impression you are eating more than you are?	92%	
12. How often do you quickly clear your plate in order to hide how much food you have or have not eaten?	92%	
13. How often do you deliberately hide food in order to give the impression you have eaten more than you have?	85%	*Specify (e.g., in a napkin)*
Part 2		
14. How often do you hide engaging in compensatory behaviors (e.g. over-exercising, vomiting, and/or taking laxatives or diet pills)?	100%	
15. How often do you make up stories so you can be alone to **binge**?	92%	*Prefer excuses to stories*
16. How often do you lie about **bingeing**?	100%	
17. How often do you **binge** in secret?	100%	
18. When you are on a **diet,** how often do you try to hide it from others?	92%	*Make wording consistent*
19. How often do you lie about **dieting**?	100%	
20. How often do you minimize how much you **exercise**?	46%	*Don't use the word minimize* *How often do you lie about time spent exercising?*
21. How often do you **exercise** in secret?	100%	

22. How often do you lie about **exercising?**	92%
23. How often do you make up stories so no one will know you are **exercising**?	100%
24. How often do you hide **diet pills** and/or **laxatives**?	100%
25. How often do you lie about using **diet pills** and/or **laxatives**?	92%
26. How often do you make up excuses to go to the bathroom after eating so you can **purge**?	100%
27. How often do you make up stories to hide the fact that you **threw up** after eating?	100%
28. How often do you lie about **purging**?	100%

Table 4

Summary of expert panel feedback

Question	*Expert 1*	*Expert 2*	*Expert 3*	*Expert 4*	*Expert 5*
2-Part Structure "Do you think it makes sense to ask questions pertaining to both general as well as specific disordered eating"	There is utility in a 2-part structure	You need to be clear as to whether you are assessing disordered eating or denial	Assessing specific behaviors separately makes sense	The 2-part structure is fine, but you need to be clear about the difference	The utility of the 2-part structure is an empirical question
Instructions "What is your opinion of the current instructions: The following questions are concerned with the PAST MONTH. Please read each question and circle the appropriate number to the right. How often do you…"	You should use, "How often did you.." as opposed to "How often do you…"	The instructions are Fine as is	Change the term "concerned with…"	At some point you might want lifetime data as opposed to past month	Provide more context and empathy within the instructions
Response Scale "What is your opinion of the Likert scale currently being used?"	Some people prefer a 7-point scale to a 5-point scale	The scaling is fine, but you could consider anchoring the time points (i.e., number of days)	I think this scaling works well	You could link scale to actual frequency (i.e., number of days)	You could use a 7-point scale to increase variability
Item phrasing "What is your opinion of the item phrasing being used"	The item phrasing seems to be a good fit	The stem for the item phrasing is fine	The phrasing should be past tense (i.e., "how often have you" versus "how often do you"	I am not sure there would be anything better	Put the item phrasing once at the top (i.e., "how often have you…"
Scale utility "Do you think this would be a useful scale?"	It is funny to ask people to self-report denial, but deliberate denial makes sense	This is an interesting measure and there is not a current scale like it	I like this a lot	Great addition to the literature	This has its place, but valid answers will require insight and willingness

Table 5

Descriptive Statistics for Validity Measures

Scale	Min	Max	Mean (SD)	Skew	Kurtosis
EDEQ	0	5.13	2.09(1.14)	.18	-.45
BSQ	16	96	49.12(20.38)	.28	-.76
EAT	26	85	29.58(10.34)	1.75	1.63
SCSI	1	5	2.57(1.02)	.26	-.883
DDI	12	58	34.97(6.18)	-.88	2.97
MCSDS	4	29	16.20(4.83)	.31	-.27
NEUROTICISM	19	63	40.84(8.84)	-.06	-.29
SBQR	4	19	6.62(3.22)	1.34	1.27
DSHSI	0	28	3.11(6.06)	2.28	4.34
EATLIE	0	7	1.52(1.69)	1.06	.27

Note. EAT = Eating Attitudes Test. EDEQ = Eating Disorder Questionnaire. BSQ = Body Dissatisfaction Questionnaire. SCSI = Self Concealment Inventory. SBQR = Suicide Behaviors Questionnaire – Revised. DSHI = Deliberate Self Harm Inventory. MCSDS = Marlowe Crowne Social Desirability Scale. DDI = Distress Disclosure Index. NEURO = Neuroticism. Min = Minimum Score. Max = Maximum Score. SD = Standard Deviation.

Table 6

Deliberate Denial of Disordered Eating Behaviors Scale
39-Item Exploratory Factor Analysis Loadings

Item *How often have you…*	*Deliberate Denial of Disordered Eating (General)*	*Deliberate Denial of Binge Eating*	*Deliberate Denial of Weight Control Behaviors*	*Deliberate Denial of Dietary Restriction*	*Deliberate Denial of Vomiting*
Been dishonest about how much you ate?	**.896**				
Been dishonest about how frequently you ate?	**.895**				
Been dishonest about what you ate?	**.882**				
Told people you are not hungry when you are?	**.726**				
Told people you have eaten when you have not?	**.720**				
Told people you are going to eat later in order to avoid eating?	**.711**				
Told people you felt sick in order to avoid eating?	**.606**		.415		
Ate less food than you led others to believe?	**.587**			.550	
Made up excuses to avoid events where you know food will be served?	**.580**				
Ate slowly in order to give the impression that you are eating more than you are?	**.548**			.564	
Eaten in secret?	**.498**	.564			
Ate more food than you led others to believe?	**.486**	.490			
Quickly cleared your plate in order to hide how much food you ate?	**.483**			.613	
Spread food around on your plate in order to give other the impression you ate more than you did?	**.479**			.597	

Quickly cleared your plate in order to hide how much you did NOT eat?	**.478**			.699
Binge eaten in secret?		**.889**		
Been dishonest about binge eating?		**.871**		
Hid food to binge on?		**.791**		
Been dishonest about feeling a loss of control over your eating?		**.778**	.404	
Hid from others that you sometimes lose control over your eating?		**.735**		
Made up excuses so you can be alone to binge eat (i.e., eating a large amount of food in a short amount of time)?		**.727**		
Hid bingeing or eating large amounts of food in a short amount of time?		**.682**		
Admitted to someone you trust that you binge eat, or eat large amounts of food in a short amount of time?*		**.509**	.519	
Admitted to someone you trust that when you eat you sometimes feel out of control?*		**.485**	.556	
Spent more time exercising than you lead others to believe?			**.750**	
Been dishonest about using diet pills and/or laxative?			**.653**	
Exercised in secret?			**.643**	
Intentionally hid dieting (e.g., follow food rules, intentionally eat less than you normally would) from others?			**.633**	
Been dishonest about dieting?			**.609**	
Made up excuses so no one will know you are exercising?			**.598**	
Made up excuses to skip meals or snacks?	.466		**.563**	

Admitted to someone you trust that you do things such as over-exercising, vomiting after you eat, and/or taking laxative or diet pills?*	**.487**		
Told people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?	**.443**		
Made up stories or excuses to hide the fact that you vomited after eating?			**.824**
Been dishonest about vomiting after eating (i.e., making yourself sick after eating)?			**.761**
Hid doing things such as over-exercising, vomiting after you eat, and/or taking laxatives or diet pills?	.454		**.528**
Deliberately hid food (e.g., in a napkin) in order to give the impression you ate more than you did?		.617	
Openly talked about your eating habits with someone you are close to?*			

Table 7

Deliberate Denial of Disordered Eating Behaviors Scale
17-item Exploratory Factor Analysis Loadings

Item	*Factor 1*	*Factor 2*
How often have you…		
Ate less food than you led others to believe?	.878	-.129
Quickly cleared your plate in order to hide how much you did NOT eat?	.867	-.304
Ate slowly in order to give the impression that you are eating more than you are?	.845	-.167
Spread food around on your plate in order to give other the impression you ate more than you did?	.832	-.240
Been dishonest about how much you ate?	.830	.449
Told people you felt sick in order to avoid eating?	.819	-.021
Quickly cleared your plate in order to hide how much food you ate?	.819	-.182
Been dishonest about what you ate?	.815	.447
Been dishonest about how frequently you ate?	.804	.466
Made up excuses to avoid events where you know food will be served?	.792	-.005
Told people you have eaten when you have not?	.777	.174
Deliberately hid food (e.g., in a napkin) in order to give the impression you ate more than you did?	.761	-.330
Ate more food than you led others to believe?	.728	.008
Told people you are going to eat later in order to avoid eating?	.722	.225
Told people you are not hungry when you are?	.722	.292
Eaten in secret?	.649	.143
Told people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?	.610	-.110

Table 8

Deliberate Denial of Disordered Eating Behaviors Scale
12-item Exploratory Factor Analysis Factor Loading

Item *How often have you…*	*Deliberate Denial of Disordered Eating Behaviors (General)*
Ate less food than you led others to believe?	.875
Told people you felt sick in order to avoid eating?	.830
Quickly cleared your plate in order to hide how much food you ate?	.817
Ate slowly in order to give the impression that you are eating more than you are?	.811
Made up excuses to avoid events where you know food will be served?	.800
Been dishonest about how much you ate?	.762
Deliberately hid food (e.g., in a napkin) in order to give the impression you ate more than you did?	.753
Ate more food than you led others to believe?	.747
Told people you are not hungry when you are?	.719
Told people you have eaten when you have not eaten?	.716
Eaten in secret?	.666
Told people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?	.637

Table 9

Item Statistics

Item	Min	Max	Mean(SD)	Skew	Kurtosis
DDEBS1	1	7	2.17 (1.47)	1.41	1.55
DDEBS2	1	7	2.07 (1.51)	1.54	1.58
DDEBS3	1	7	1.65 (1.27)	2.30	4.89
DDEBS4	1	7	3.45 (2.01)	0.31	1.19
DDEBS5	1	7	2.51 (1.66)	1.01	0.24
DDEBS6	1	7	2.33 (1.57)	1.08	0.32
DDEBS7	1	7	2.34 (1.57)	1.06	0.18
DDEBS8	1	7	2.28 (1.59)	1.17	0.41
DDEBS9	1	7	1.78 (1.33)	1.91	3.21
DDEBS10	1	7	1.65 (1.20)	2.18	4.46
DDEBS11	1	7	1.70 (1.27)	2.00	3.40
DDEBS12	1	7	1.59 (1.21)	2.34	5.30
DDEBS13	1	7	1.56 (1.25)	2.56	6.24
DDEBS14	1	7	1.46 (1.10)	3.05	9.86
DDEBS15	1	7	1.87 (1.39)	1.62	1.73
DDEBS16	1	7	1.75 (1.34)	2.02	3.57
DDEBS17	1	7	1.65 (1.41)	2.31	4.57
DDEBS18	1	7	1.84 (1.50)	1.88	2.62
DDEBS19	0	7	1.42 (1.59)	2.10	4.04
DDEBS20	0	7	1.44 (1.48)	1.84	3.42
DDEBS21	0	7	1.44 (1.50)	1.97	3.76
DDEBS22	0	7	1.32 (1.42)	2.00	4.07
DDEBS23	0	7	1.25 (1.37)	2.29	5.37
DDEBS24	0	7	1.34 (1.35)	1.91	3.76
DDEBS25	0	7	2.10 (2.00)	1.12	0.14
DDEBS26	0	7	1.18 (1.27)	2.32	5.86
DDEBS27	0	7	1.34 (1.49)	2.16	4.52
DDEBS28	0	7	1.37 (1.45)	2.01	3.93
DDEBS29	0	7	1.30 (1.40)	2.12	4.71
DDEBS30	0	7	1.26 (1.26)	1.95	3.99
DDEBS31	0	7	1.47 (1.49)	1.90	3.48
DDEBS32	0	7	1.59 (1.46)	1.51	2.04
DDEBS33	0	7	1.57 (1.61)	1.70	2.31
DDEBS34	0	7	1.46 (1.53)	1.80	2.86
DDEBS35	0	7	1.38 (1.45)	2.04	4.01
DDEBS36	0	7	1.22 (1.25)	2.39	6.53
DDEBS37	0	7	1.12 (1.25)	2.53	7.15
DDEBS38	0	7	1.22 (1.47)	2.65	7.20
DDEBS39	0	7	1.20 (1.43)	2.74	7.94

Note. DDEBS = Deliberate Denial of Disordered Eating Behaviors Scale. Min = Minimum Score. Max = Maximum Score. SD = Standard Deviation.

Table 10

Eigenvalues for the initial 39-item exploratory factor analysis

Component	Total	% Variance	Cumulative %
1	19.19	49.20	49.20
2	4.15	10.63	59.83
3	1.92	4.93	64.76
4	1.66	4.24	69.01
5	1.27	3.26	72.27

Table 11

Eigenvalues for the 17-item exploratory factor analysis

Component	Total	% Variance	Cumulative %
1	10.80	63.51	63.51
2	1.40	8.26	71.77

Table 12

Items for the three scale variations (17-item, 12-item, and 4-item screening measure)

17-item How often have you…	12-item How often have you…	4-item How often have you…
1. Told people you have eaten when you have not eaten?	1. Told people you have eaten when you have not eaten?	1. Told people you have eaten when you have not eaten?
2. Told people you are going to eat later in order to avoid eating?	3. Made up excuses to avoid events where you know food will be served?	3. Made up excuses to avoid events where you know food will be served?
3. Made up excuses to avoid events where you know food will be served?	5. Told people you are not hungry when you are?	5. Told people you are not hungry when you are?
5. Told people you are not hungry when you are?	7. Been dishonest about how much you ate?	7. Been dishonest about how much you ate?
6. Been dishonest about what you ate?	9. Eaten in secret?	
7. Been dishonest about how much you ate?	11. Ate slowly in order to give the impression that you are eating more than you are?	
8. Been dishonest about how frequently you ate?	12. Quickly cleared your plate in order to hide how much food you ate?	
9. Eaten in secret?	14. Deliberately hid food (e.g., in a napkin) in order to give the impression you ate more than you did?	
10. Spread food around on your plate in order to give other the impression you ate more than you did?	15. Ate more food than you led others to believe?	
11. Ate slowly in order to give the impression that you are eating more than you are?	16. Ate less food than you led others to believe?	
12. Quickly cleared your plate in order to hide how much food you ate?	17. Told people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?	
13. Quickly cleared your plate in order to hide how much you did NOT eat?	18. Told people you felt sick in order to avoid eating?	

14. Deliberately hid food (e.g., in a napkin) in order to give the impression you ate more than you did?

15. Ate more food than you led others to believe?

16. Ate less food than you led others to believe?

17. Told people you have dietary restrictions (e.g., gluten free) in order to avoid eating certain foods?

18. Told people you felt sick in order to avoid eating?

Table 13

Item-Total Correlations

17-item		12-item		4-item	
DDEBS1	.771	DDEBS1	.771	DDEBS1	.868
DDEBS2	.820	DDEBS3	.817	DDEBS3	.818
DDEBS3	.817	DDEBS5	.777	DDEBS5	.879
DDEBS5	.777	DDEBS7	.829	DDEBS7	.866
DDEBS6	.850	DDEBS9	.691		
DDEBS7	.829	DDEBS11	.822		
DDEBS8	.858	DDEBS12	.807		
DDEBS9	.691	DDEBS14	.732		
DDEBS10	.805	DDEBS15	.749		
DDEBS11	.822	DDEBS16	.867		
DDEBS12	.807	DDEBS17	.639		
DDEBS13	.830	DDEBS18	.835		
DDEBS14	.732				
DDEBS15	.749				
DDEBS16	.867				
DDEBS17	.639				
DDEBS18	.835				

Table 14

Alphas by Scale Version

Scale Version	Cronbach's Alpha
17-item	.962
12-item	.941
4-item	.878

Table 15

Descriptive Statistics by Scale Version

Version	Min	Max	Mean (SD)	Skew	Kurtosis
DDEBS17	1	7	1.88(1.10)	1.82	3.42
DDEBS12	1	7	1.84(1.10)	1.90	3.76
DDEBS4	1	7	2.17(1.23)	1.46	1.95

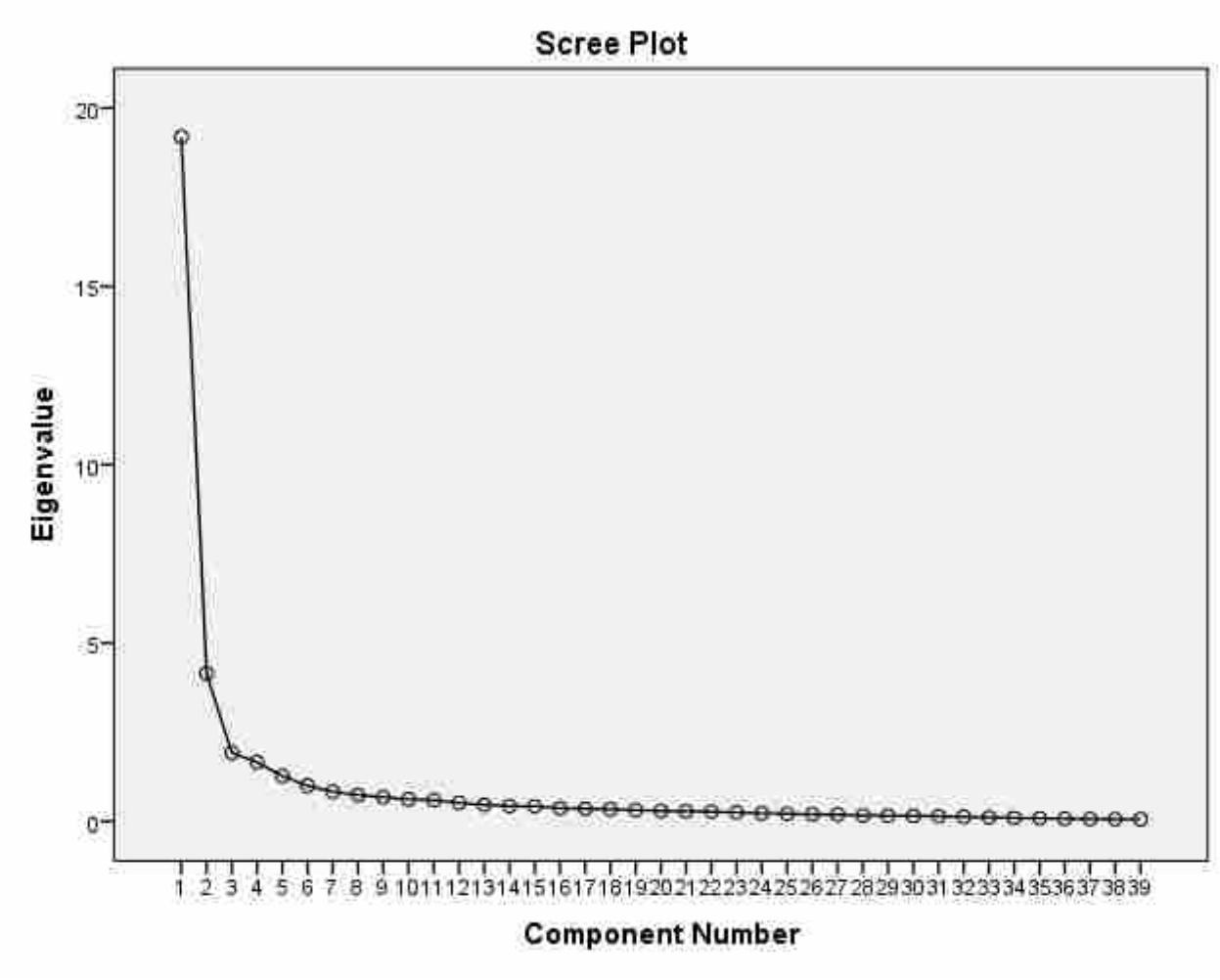
Table 16

Bivariate Correlation Table (DDEBS 12-item)

Scale	DDEBS	EATLIE	EAT	EDEQ	BSQ	SCSI	SBQR	DSHSI	MCSDS	DDI	NEURO
DDEBS	1	.06	.48**	.47**	.55**	.30**	.32**	.38**	-.08	-.28**	.10
EATLIE		1	-.06	-.08	-.22**	.05	-.16**	.08	.33**	-.12*	-.12*
EAT			1	.59**	.56**	.20**	.34**	.22**	-.07	-.15**	.16**
EDEQ				1	.68**	.17**	.26**	.19**	-.16**	-.12*	.17**
BSQ					1	.37**	.31**	.26**	-.21**	-.18**	.19**
SCSI						1	.37**	.18**	-.16**	-.41**	.21**
SBQR							1	.47**	-.12*	-.19**	.24**
DSHSI								1	-.15**	-.10	.23**
MCSDS									1	-.13*	-.50**
DDI										1	-.02
NEUROTIC											1

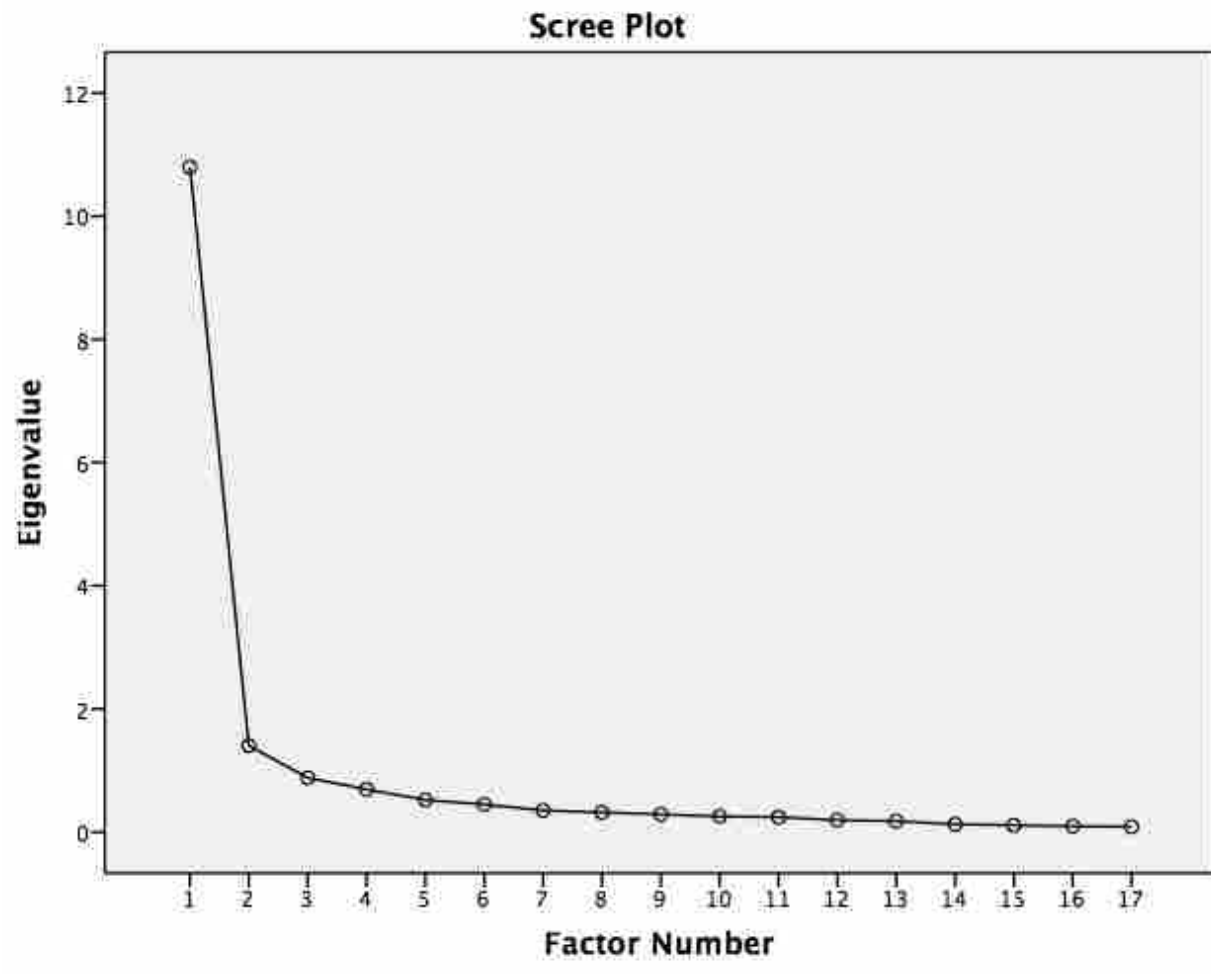
Note. DDEBS = Deliberate Denial of Disordered Eating Behaviors Scale. EAT = Eating Attitudes Test. EDEQ = Eating Disorder Questionnaire. BSQ = Body Dissatisfaction Questionnaire. SCSI = Self Concealment Inventory. SBQR = Suicide Behaviors Questionnaire – Revised. DSHI = Deliberate Self Harm Inventory. MCSDS = Marlowe Crowne Social Desirability Scale. DDI = Distress Disclosure Index. NEURO = Neuroticism. $^{*}p < .05$ $^{**}p < .01$ $^{***}p < .001$

Figure 1



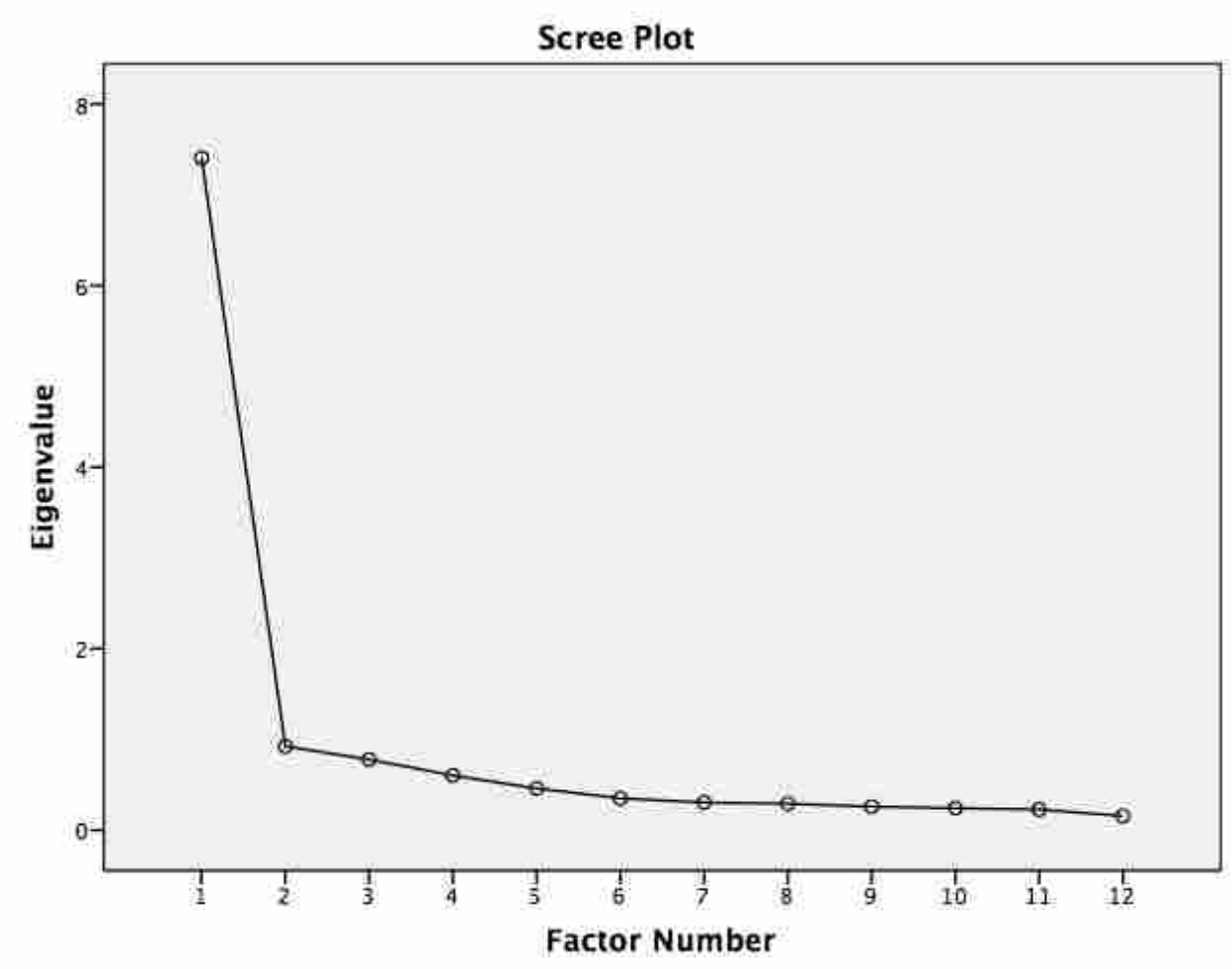
Deliberate Denial of Disordered Eating Behaviors initial 39-item Scree Plot

Figure 2



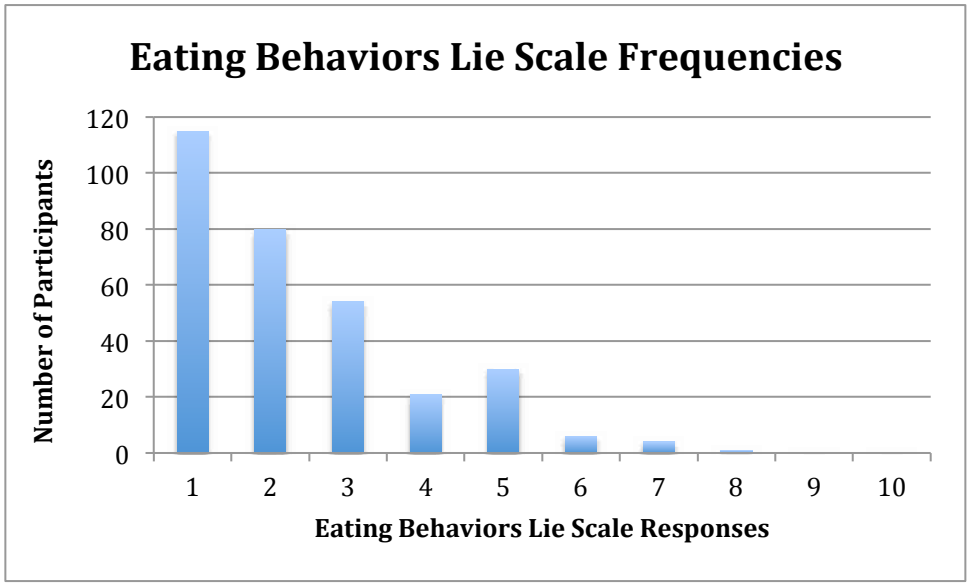
Deliberate Denial of Disordered Eating Behaviors 17-item Scale Scree Plot

Figure 3



Deliberate Denial of Disordered Eating Behaviors 12-item Scale Scree Plot

Figure 4



Eating Behaviors Lie Scale Histogram

APPENDIX A

FOCUS GROUP OUTLINE*

Participants

- 2 groups of 6-8 female undergraduates from a large southeastern university
- Ages 18-22
- Recruited from an online survey in which they expressed interest in future research
- Engaging in, at least, subclinical levels of eating pathology: scoring greater than a 2.3 on the EDE-Q or self-report of specific disordered eating behaviors
- No current or past treatment for an eating disorder

Logistics

- Circle seating in a private room
- Session will be tape recorded
- Principal Investigator will moderate the session
- Assistant moderator will take careful notes and monitor recording equipment
- 60 minute session

Format

1. Welcome
    a. Introduced moderator and assistant
2. Overview of topic (10 minutes)
    a. Definition of deliberate denial of disordered eating behaviors
    b. Purpose: Scale development
    c. Importance of studying deliberate denial of disordered eating behaviors
    d. "You were selected to help us generate items for the scale and provide feedback on the items we have already created"
3. Guidelines (5 minutes)
    a. Session is tape recorded
    b. No cell phones
    c. One person speaking at a time
    d. There are no right or wrong answers
    e. You don't need to agree with others, but you must listen respectfully as others share their views
    f. Talk to each other
4. Ice Breaker (5 minutes)
    a. Go around the room and share name, major, and favorite summer activity
5. Item Generation (20 minutes)
    a. Asked group to take 10 minutes to think of items that they think would assess deliberate denial of disordered eating behaviors. "An example item might be, 'I tell people I have already eaten when I have not'"
    b. Item sharing

   i. Asked focus group to share items that they created and wrote down items on a white board
   ii. Asked group to continue to think of items as the moderators wrote them down

6. Item Feedback (20 minutes)
   a. Gave the focus group the list of pre-existing items and allowed them 10 minutes to complete item review sheet
      i. See Appendix C for item review worksheet
   b. Discussion of items
      i. What item(s) do you think is/are best? How come?
      ii. What item(s) do you think is/are worst? How come?
      iii. What item(s) do you think would be better if the wording was changed?
      iv. Are there any other items you think should be added since seeing this list?
7. Conclusion
   a. Summarized feedback
   b. Reviewed purpose and how the information will be used
   c. Thanked group for the items they generated as well as their feedback on existing items
   d. Paid participants $15
   e. Dismissal

*Format developed from:

Krueger, R.A. (2002). *Designing and conducting focus group interviews*. University of Minnesota. Retrieved April 30, 2016, from http://www.eiu.edu/~ihec/Krueger-FocusGroupInterviews.pdf

APPENDIX B

FOCUS GROUP EMAIL CONTACT

Hello _____,

I am contacting you because you completed a survey this past year entitled CHASE. CHASE inquired about your health, well-being, and general life experiences and attitudes. At the end of the survey, you indicated interest in future research studies. I am building a scale that measures aspects of eating patterns in college women, and was wondering if you would be willing to participate in a focus group to help with scale development?

You would be asked to come to the Mills Godwin Building on Old Dominion University's campus within the next few weeks. The focus group would last approximately 45 minutes to 1 hour. You would be asked to participate in a group discussion, assist in creating items for the scale, and provide feedback on the items that have already been created for the scale. You will receive $15 for participating in the focus group.

Please let me know if you are or are not interested in participating in the focus group. If you are interested, please send me your availability, and I will send you the informed consent document.

Thanks,

_____

APPENDIX C

ITEM REVIEW WORKSHEET

STEP 1: For the below items, please put a check in the box to the left of the items that you **DO NOT** fit with the definition of deliberate denial of disordered eating behaviors (that we discussed earlier) or that are poorly worded

Scale Items

The following questions are concerned with the PAST MONTH. Please read each question and circle the appropriate number to the right. Please answer all the questions.

1 = Not at all 2 = Rarely 3 = Sometimes 4 = Frequently 5 = Very frequently

***6 = I have not engaged in this behavior within the past month**

General (No option to select 6)

1. How often do you tell people you have eaten when you have not?
2. How often do you make up excuses to avoid social events where you know food will be served?
3. How often are you honest with others if you find it hard to resist food? (reverse code)
4. How often do you tell people you are not hungry when you are?
5. How often do you tell people you have dietary restrictions in order to avoid eating certain foods?
6. How often do you tell people you feel sick in order to avoid eating?
7. How often do you lie about what you eat?
8. How often do you eat in secret (i.e. furtively)?
9. How often do you spread food around on your plate in order to give others the impression you have eaten more than you have?
10. How often do you make up excuses to avoid events where people might see your body (for example, avoid going to the beach)?
11. How often do you eat slowly in order to give the impression you are eating more than you are?
12. How often do you quickly clear your plate in order to hide how much food you have or have not eaten?

13. How often do you deliberately hide food in order to give the impression you have eaten more than you have?

The following questions are concerned with the PAST MONTH. Please read each question and circle the appropriate number to the right. Please answer all the questions. **If you have not engaged in the behavior within the past month please select 6**

Specific Behaviors (Select 6 if you have not engaged in this behavior within the past month)

14. How often do you hide engaging in compensatory behaviors (e.g. over-exercising, vomiting, and/or taking laxatives or diet pills)?
15. How often do you make up stories so you can be alone to **binge**?
16. How often do you lie about **bingeing**?
17. How often do you **binge** in secret?
18. When you are on a **diet,** how often do you try to hide it from others?
19. How often do you lie about **dieting**?
20. How often do you minimize how much you **exercise**?
21. How often do you **exercise** in secret?
22. How often do you lie about **exercising?**
23. How often do you make up stories so no one will know you are **exercising**?
24. How often do you hide **diet pills** and/or **laxatives**?
25. How often do you lie about using **diet pills** and/or **laxatives**?
26. How often do you make up excuses to go to the bathroom after eating so you can **purge**?
27. How often do you make up stories to hide the fact that you **threw up** after eating?
28. How often do you lie about **purging**?

STEP 2: For those items that you put a check next to please answer the below questions:

Item #:

Why is this not a good item?

Do you think this item should be dropped from the scale? YES NO
Do you think this item should be re-worded? YES NO
If yes, how?

Item #:

Why is this not a good item?

Do you think this item should be dropped from the scale? YES NO
Do you think this item should be re-worded? YES NO
If yes, how?

Item #:

Why is this not a good item?

Do you think this item should be dropped from the scale? YES NO
Do you think this item should be re-worded? YES NO
If yes, how?

APPENDIX D

EXPERT PANEL OUTLINE

Detailed Procedure

1. Initial Email
    a. Email sent to members of the expert panel that contained the study abstract and asked if they would be interested in giving their feedback on the scale
    b. One prospective member declined to participate and a replacement member was contacted
2. Second Email
    a. After agreement, a second email was sent that contained a link to a survey that contained the below questions:
        i. Provide feedback on each item (if applicable)
        ii. Do you think it makes sense to ask questions pertaining to both general as well as specific disordered eating? Why or why not?
        iii. What instructions do you think should accompany the scale?
        iv. What is your opinion of the Likert scale currently being used?
        v. What is your opinion of the item phrasing currently being used?
        vi. What do you consider the strengths and weaknesses of this scale?
3. Feedback
    a. Members' feedback was recorded in a Qualtrics survey.

APPENDIX E

QUESTIONNAIRES

About You

1. What is your birth date? Month ___ ___ / Day ___ ___ / Year ___ ___

2. What is your height: ____ feet, _____ inches

3. What is your best guess of your weight? _____ pounds

4. What is your race? (circle as many as apply)
(1) Black or African American (4) American Indian or Alaska Native
(2) White or Caucasian (5) Native Hawaiian or Other Pacific Islander
(3) Asian or Asian American (6) Other _____

5. How do you define your sexual identity? Would you say that you are:
(1) Only homosexual/lesbian/gay
(2) Mostly homosexual/lesbian/gay
(3) Bisexual
(4) Mostly heterosexual
(5) Only heterosexual
(6) Other _____

6. Are you CURRENTLY receiving any of the following types of mental health treatment?
a. Psychotherapy or counseling? Yes No
b. Pharmacotherapy or medications? Yes No
c. Other mental health treatment (e.g., chemical dependency)? Yes No
d. Treatment for an eating disorder? Yes No

7. In the PAST have you received any of the following types of mental health treatment?
a. Psychotherapy or counseling? Yes No
b. Pharmacotherapy or medications? Yes No
c. Other mental health treatment (e.g., chemical dependency)? Yes No
d. Treatment for an eating disorder? Yes No

Eating Disorder Examination – Questionnaire (EDE-Q)

The following questions are concerned with the PAST FOUR WEEKS ONLY (28 days). Please read each question carefully and circle the letter that corresponds to the appropriate number of days on the right.

ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…	**No days**	**1-5 days**	**6-12 days**	**13-15 days**	**16-22 days**	**23-27 days**	**Every day**
1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight?	0	1	2	3	4	5	6
2. Have you gone for long periods of time (8 hours or more when not sleeping) without eating anything in order to influence your shape or weight?	0	1	2	3	4	5	6
3. Have you tried to avoid eating any foods that you like in order to influence your shape or weight?	0	1	2	3	4	5	6
4. Have you tried to follow definite rules regarding your eating in order to influence your shape or weight; for example, a calorie limit, a set amount of food, or rules about what or when you should eat?	0	1	2	3	4	5	6
	No days	**1-5 days**	**6-12 days**	**13-15 days**	**16-22 days**	**23-27 days**	**Every day**
5. Have you wanted your stomach to be empty?	0	1	2	3	4	5	6
6. Has thinking about food or its calorie content made it much more difficult to concentrate on things you are interested in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
7. Have you been afraid of losing control over eating?	0	1	2	3	4	5	6
8. Have you had episodes of binge eating?	0	1	2	3	4	5	6
9. Have you eaten in secret? (Do not count binges.)	0	1	2	3	4	5	6

10. Have you definitely wanted your stomach to be flat?	0	1	2	3	4	5	6
ON HOW MANY DAYS OUT OF THE PAST 28 DAYS…	**No days**	**1-5 days**	**6-12 days**	**13-15 days**	**16-22 days**	**23-27 days**	**Every day**
11. Has thinking about shape or weight made it more difficult to concentrate on things you are in; for example, read, watch TV, or follow a conversation?	0	1	2	3	4	5	6
12. Select 1-5 days for this question.							
13. Have you had a definite fear that you might gain weight or become fat?	0	1	2	3	4	5	6
14. Have you felt fat?	0	1	2	3	4	5	6
15. Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

15. On what proportion of times that you have eaten have you felt guilty because the effect on your shape or weight? (Do not count binges.)

(A) None of the times
(B) A few of the times
(C) Less than half the times
(D) Half the times
(E) More than half the times
(F) Most of the time
(G) Every time

16. Over the past four weeks (28 days), have there been any times when you have felt that you have eaten what other people would regard as an unusually large amount of food given the circumstances? No Yes

If you answered yes:

16a. How many such episodes have you had over the past four weeks? _____

16b. During how many of these episodes of overeating did you have a sense of having lost control over your eating? _____

17. Have you had other episodes of eating in which you have had a sense of having lost control and eaten too much, but have not eaten an unusually No Yes

large amount of food given the circumstances?

If you answered yes:

17a. How many such episodes have you had over the past four weeks? _____

18. Over the past four weeks, have you made yourself sick (vomit) as a means of controlling your shape or weight? No Yes

If you answered yes:

18a. How many have you done this over the past four weeks? _____

19. Over the past four weeks, have you taken laxatives as a means of controlling your shape or weight? No Yes

If you answered yes:

19a. How many have you done this over the past four weeks? _____

20. Over the past four weeks, have you taken diuretics (water tablets) as a means of controlling your shape or weight? No Yes

If you answered yes:

20a. How many have you done this over the past four weeks? _____

21. Over the past four weeks, have you exercised hard as a means of controlling your shape or weight? No Yes

If you answered yes:

21a. How many have you done this over the past four weeks? _____

Over the past 4 weeks (28 days)…	Not at all		Slightly	Moderately		Markedly	
22. Has your weight influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23. Has your shape influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24. How much would it upset you if you had to weigh yourself once a week for the next four weeks?	0	1	2	3	4	5	6
25. How dissatisfied have you felt about your weight?	0	1	2	3	4	5	6
26. How dissatisfied have you felt about your shape?	0	1	2	3	4	5	6
27. How concerned have you been about other people seeing you eat?	0	1	2	3	4	5	6
28. How uncomfortable have you felt seeing your body; for example, in the mirror, in shop window reflections, while undressing or taking a bath or shower?	0	1	2	3	4	5	6
29. How uncomfortable have you felt about others seeing your body; for example, in communal changing rooms, when swimming or wearing tight clothes?	0	1	2	3	4	5	6

BSQ-16

We should like to know how you have been feeling about your appearance over the **PAST FOUR WEEKS**. Please read each question and circle the appropriate number to the right. Please answer all the questions.

OVER THE PAST FOUR WEEKS:	Never	Rarely	Sometimes	Often	Very often	Always
1. Have you been so worried about your shape that you have been feeling you ought to diet?.....	1	2	3	4	5	6
2. Have you been afraid that you might become fat (or fatter)?.....	1	2	3	4	5	6
3. Has feeling full (e.g. after eating a large meal) made you feel fat?.....	1	2	3	4	5	6
4. Have you noticed the shape of other women and felt that your own shape compared unfavorably?.....	1	2	3	4	5	6
5. Has thinking about your shape interfered with your ability to concentrate (e.g. while watching television, reading, listening to conversations)?.....	1	2	3	4	5	6
6. Has being naked, such as when taking a bath, made you feel fat?.....	1	2	3	4	5	6
7. Have you imagined cutting off fleshy areas of your body?.....	1	2	3	4	5	6
8. Have you not gone out to social occasions (e.g. parties) because you have felt bad about your shape?.....	1	2	3	4	5	6
9. Have you felt excessively large and rounded?.....	1	2	3	4	5	6

10. Have you thought that you are in the shape you are because you lack self-control?.....	1	2	3	4	5	6
11. Have you worried about other people seeing rolls of fat around your waist or stomach?.....	1	2	3	4	5	6
12. When in company have your worried about taking up too much room (e.g. sitting on a sofa, or a bus seat)?.....	1	2	3	4	5	6
13. Has seeing your reflection (e.g. in a mirror or shop window) made you feel bad about your shape?.....	1	2	3	4	5	6
14. Have you pinched areas of your body to see how much fat there is?.....	1	2	3	4	5	6
15. Have you avoided situations where people could see your body (e.g. communal changing rooms or swimming baths)?.....	1	2	3	4	5	6
16. Have you been particularly self-conscious about your shape when in the company of other people?.....	1	2	3	4	5	6

DSHI-s

This questionnaire asks about a number of different things that people sometimes do to hurt themselves. Please be sure to read each question carefully and respond honestly. Often, people who do these kinds of things to themselves keep it a secret, for a variety of reasons. However, honest responses to these questions will provide us with greater understanding and knowledge about these behaviors and the best way to help people.

Please answer yes to a question only if you did the behavior intentionally, or on purpose, to hurt yourself. Do not respond yes if you did something accidentally (e.g., you tripped and banged your head on accident). Also, please be assured that your responses are completely confidential.

Please circle one response alternative for each question!

1	Have you ever intentionally cut your wrist, arms, or other areas of your body?	Never	Once	More than once	Many times
2	Have you ever intentionally burned yourself with a cigarette, lighter or a match?	Never	Once	More than once	Many times
3	Have you ever intentionally carved words, pictures, designs or other marks into your skin?	Never	Once	More than once	Many times
4	Have you ever intentionally severely scratched yourself, to the extent that scarring or bleeding occurred?	Never	Once	More than once	Many times
5	Have you ever intentionally bit yourself, to the extent that you broke the skin?	Never	Once	More than once	Many times
6	Have you ever intentionally rubbed sandpaper on your body?	Never	Once	More than once	Many times

7	Have you ever intentionally dripped acid onto your skin?	Never	Once	More than once	Many times
8	Have you ever intentionally used bleach, comet, or oven cleaner to scrub your skin?	Never	Once	More than once	Many times
9	Have you ever intentionally stuck sharp objects such as needles, pins, staples, etc. into your skin? (not including tattoos, ear piercing, needles used for drug use, or body piercing)	Never	Once	More than once	Many times
10	Have you ever intentionally rubbed glass into your skin?	Never	Once	More than once	Many times
11	Have you ever intentionally broken your own bones?	Never	Once	More than once	Many times
12	Have you ever intentionally banged your head against something, to the extent that you caused a bruise to appear?	Never	Once	More than once	Many times
13	Have you ever intentionally punched yourself, to the extent that you caused a bruise to appear?	Never	Once	More than once	Many times
14	Have you ever intentionally prevented wounds from healing?	Never	Once	More than once	Many times
15	Have you ever done anything else to hurt yourself that was not asked about in this questionnaire? If yes, what did you do to hurt yourself?	Never	Once	More than once	Many times

16	Have you ever intentionally hurt yourself in any of the above-mentioned ways so that it led to hospitalization or injury severe enough to require medical treatment?	Never	Once	More than once	Many times

SBQ-R

Please check the number beside the statement or phrase that best applies to you

1. **Have you ever thought about or attempted to kill yourself? (check only one)**

    1. Never

    2. It was just a brief passing thought

    3a. I have had a plan at least once to kill myself but did not try to do it

    3b. I have had a plan at least once to kill myself and really wanted to die

    4a. I have attempted to kill myself, but did not want to die

    4b. I have attempted to kill myself, and really hoped to die

2. How often have you thought about killing yourself in the past year? (Check only one)

    1. Never

    2. Rarely (1 time)

    3. Sometimes (2 times)

    4. Often (3-4 times)

    5. Very Often (5 or more times)

3. Have you ever told someone that you were going to commit suicide or that you might do it? (Check only one)

    1. No

    2a. Yes, at one time, but did not really want to die

    2b. Yes, at one time, and really wanted to die

    3a. Yes, more than once, but did not want to do it

    3b. Yes, more than once, and really wanted to do it

4. How likely is it that you will attempt suicide someday? (Check only one)

    0. Never

    1. No chance at all

    2. Rather Unlikely

    3. Unlikely

4. Likely

5. Rather Likely

6. Very Likely

The 40-Item Mini-Marker Set

Please use the list of common human traits to describe yourself as accurately as possible. Describe yourself as you see yourself at the present time, not as you wish to be in the future. Describe yourself as you are generally or typically, as compared with other persons you know of the same sex or roughly your same age. Before each trait, please write a number indicating how accurately each trait describes you, using the following rating scale:

Inaccurate ? Accurate

Extremely Very Moderately Slightly Slightly Moderately Very Extremely

1 2 3 4 5 6 7 8 9

_____ Bashful	_____ Disorganized	_____ Inefficient	_____ Quiet
_____ Bold	_____ Efficient	_____ Intellectual	_____ Relaxed
_____ Careless	_____ Energetic	_____ Jealous	_____ Rude
_____ Cold	_____ Envious	_____ Kind	_____ Shy
_____ Complex	_____ Extraverted	_____ Moody	_____ Sloppy
_____ Cooperative	_____ Fretful	_____ Organized	_____ Sympathetic
_____ Creative	_____ Harsh	_____ Philosophical	_____ Systematic
_____ Deep	_____ Imaginative	_____ Practical	_____ Talkative
_____ Temperamental	_____ Unintellectual	_____ Unsympathetic	_____ Warm
_____ Touchy	_____ Withdrawn	_____ Uncreative	

Distress Disclosure Index (DDI)

Please read each of the following items carefully. Indicate the extent to which you agree or disagree with each item according to the rating scale below:

1 2 3 4 5
Strongly Disagree Strongly Agree

1. When I feel upset, I usually confide in my friends.
2. I prefer not to talk about my problems.
3. When something unpleasant happens to me, I often look for someone to talk to.
4. I typically don't discuss things that upset me.
5. When I feel depressed or sad, I tend to keep those feelings to myself.
6. I try to find people to talk with about my problems.
7. When I am in a bad mood, I talk about it with my friends.
8. If I have a bad day, the last thing I want to do is talk about it.
9. I rarely look for people to talk with when I am having a problem.
10. When I'm distressed I don't tell anyone.
11. I usually seek out someone to talk to when I am in a bad mood.
12. I am willing to tell others my distressing thoughts.

Self Concealment Scale (SCS)

This scale measures self-concealment, defined here as a tendency to conceal from others personal information that one perceives as distressing or negative. Please tick the box, to the right of each of the following 10 statements, that best describes how much you personally agree or disagree with the statement.		*1=strongly disagree*	*2=moderately disagree*	*3=don't disagree or agree*	*4=moderately agree*	*5=strongly agree*
1.	I have an important secret that I haven't shared with anyone					
2.	if I shared all my secrets with my friends, they'd like me less					
3.	there are lots of things about me that I keep to myself					
4.	some of my secrets have really tormented me					
5.	when something bad happens to me, I tend to keep it to myself					
6.	I'm often afraid I'll reveal something I don't want to					
7.	telling a secret often backfires and I wish I hadn't told it					
8.	I have a secret that is so private I would lie if anybody asked me about it					
9.	my secrets are too embarrassing to share with others					
10.	I have negative thoughts about myself that I never share with anyone					

EAT-26

Part B: Check a response for each of the following statements:		Always	Usually	Often	Some times	Rarely	Never
1.	Am terrified about being overweight.	□	□	□	□	□	□
2.	Avoid eating when I am hungry.	□	□	□	□	□	□
3.	Find myself preoccupied with food.	□	□	□	□	□	□
4.	Have gone on eating binges where I feel that I may not be able to stop.	□	□	□	□	□	□
5.	Cut my food into small pieces.	□	□	□	□	□	□
6.	Aware of the calorie content of foods that I eat.	□	□	□	□	□	□
7.	Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes, etc.)	□	□	□	□	□	□
8.	Feel that others would prefer if I ate more.	□	□	□	□	□	□
9.	Vomit after I have eaten.	□	□	□	□	□	□
10.	Feel extremely guilty after eating.	□	□	□	□	□	□
11.	Am preoccupied with a desire to be thinner.	□	□	□	□	□	□
12.	Think about burning up calories when I exercise.	□	□	□	□	□	□
13.	Other people think that I am too thin.	□	□	□	□	□	□
14.	Am preoccupied with the thought of having fat on my body.	□	□	□	□	□	□
15.	Take longer than others to eat my meals.	□	□	□	□	□	□
16.	Avoid foods with sugar in them.	□	□	□	□	□	□
17.	Eat diet foods.	□	□	□	□	□	□
18.	Feel that food controls my life.	□	□	□	□	□	□
19.	Display self-control around food.	□	□	□	□	□	□
20.	Feel that others pressure me to eat.	□	□	□	□	□	□
21.	Give too much time and thought to food.	□	□	□	□	□	□
22.	Feel uncomfortable after eating sweets.	□	□	□	□	□	□
23.	Engage in dieting behavior.	□	□	□	□	□	□
24.	Like my stomach to be empty.	□	□	□	□	□	□
25.	Have the impulse to vomit after meals.	□	□	□	□	□	□
26.	Enjoy trying new rich foods.	□	□	□	□	□	□

Part C: Behavioral Questions: In the past 6 months have you:		Never	Once a month or less	2-3 times a month	Once a week	2-6 times a week	Once a day or more
A	Gone on eating binges where you feel that you may not be able to stop? *	□	□	□	□	□	□
B	Ever made yourself sick (vomited) to control your weight or shape?	□	□	□	□	□	□
C	Ever used laxatives, diet pills or diuretics (water pills) to control your weight or shape?	□	□	□	□	□	□
D	Exercised more than 60 minutes a day to lose or to control your weight?	□	□	□	□	□	□
E	Lost 20 pounds or more in the past 6 months	Yes □		No □			

* Defined as eating much more than most people would under the same circumstances and feeling that eating is out of control

Marlowe and Crowne's Social Desirability Scale

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you personally.

1. Before voting I thoroughly investigate the qualifications of all the candidates. (T)
2. I never hesitate to go out of my way to help someone in trouble. (T)
3. It is sometimes hard for me to go on with my work if I am not encouraged. (F)
4. I have never intensely disliked anyone. (T)
5. On occasion I have had doubts about my ability to succeed in life. (F)
6. I sometimes feel resentful when I don't get my way. (F)
7. I am always careful about my manner of dress. (T)
8. My table manners at home are as good as when I eat out in a restaurant. (T)
9. If I could get into a movie without paying and be sure I was not seen I would probably do it. (F)
10. On a few occasions, I have given up doing something because I thought too little of my ability. (F)
11. I like to gossip at times. (F)
12. There have been times when I felt like rebelling against people in authority even though I knew they were right. (F) ,
13. No matter who I'm talking to, I'm always a good listener. (T)
14. I can remember "playing sick" to get out of something. (F)
15. There have been occasions when I took advantage of someone. (F)
16. I'm always willing to admit it when I make a mistake. (T)
17. I always try to practice what I preach. (T)
18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people. (T)
19. I sometimes try to get even rather than forgive and forget. (F)
20. When I don't know something I don't at all mind admitting it. (T)
21. I am always courteous, even to people who are disagreeable. (T)
22. At times I have really insisted on having things my own way. (F)
23. There have been occasions when I felt like smashing things. (F)
24. I would never think of letting someone else be punished for my wrongdoings. (T)
25. I never resent being asked to return a favor. (T)
26. I have never been irked when people expressed ideas very different from my own. (T)
27. I never make a long trip without checking the safety of my car. (T)
28. There have been times when I was quite jealous of the good fortune of others. (F)
29. I have almost never felt the urge to tell someone off. (T)
30. I am sometimes irritated by people who ask favors of me. (F)
31. I have never felt that I was punished without cause. (T)
32. I sometimes think when people have a misfortune they only got what they deserved. (F)
33. I have never deliberately said

Eating Behavior Specific Lie Scale

1. I have never skipped a meal (T)

2. I have never been dissatisfied with my figure (T)

3. I am always content with my shape (T)

4. I rarely get cravings for unhealthy food (T)

5. I sometimes eat too much (F)

6. I never think about food (T)

7. I eat perfectly portioned meals (T)

8. I sometimes eat when I am not hungry (F)

9. I prefer some foods to others (F)

10. When I get hungry, I think about food (F)

VITA

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Education

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B. A.	Psychology and Economics (awarded May 2012) Saint Olaf College

Background

Lindsay Howard is a third year graduate student at the Virginia Consortium Program in Clinical Psychology. She is pursuing her Master's degree in Experimental Psychology from Old Dominion University while also pursuing her Ph.D. in Clinical Psychology from the Virginia Consortium Program. Lindsay currently does research in the Health Behaviors and Technologies Lab at Old Dominion University. Her research focuses on scale development, race differences in levels of body dissatisfaction and disordered eating, and the interpersonal formulation of eating disorders.

Selected Publications

Howard L., Heron, K., MacIntyre, R., Myers, T., & Everhart, R. (2017). Is use of social networking sites associated with young women's body dissatisfaction and eating disordered eating: A look at Black-White racial differences. *Body Image, 23,* 109-113.

Selected Presentations

Howard, L., & Heron, K. (March, 2017). *Development of the Deliberate Denial of Disordered Eating Behaviors Scale*. Poster presented at the Southeastern Psychological Association Annual Meeting, Atlanta, GA.

Howard L., Heron, K., MacIntyre, R., & Everhart, R. (April, 2016). *Does use of social networking sites influence young women's body image and eating pathology?: A look at racial differences.* Poster presented at the Society of Behavioral Medicine Conference, Washington, D.C.