

ORTHOREXIA NERVOSA: PSYCHOLOGICAL
DISORDER OR SOCIAL TREND?

THESIS

Presented to the Honors Committee of
Texas State University
in Partial Fulfillment
of the Requirements

for Graduation in the Honors College

by

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San Marcos, Texas
May 2015

ORTHOREXIA NERVOSA: PSYCHOLOGICAL
DISORDER OR SOCIAL TREND?

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ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my advisor, Dr. Crystal Oberle for her excellent guidance, encouragement and providing me with an utmost supportive environment. I could not have wished for a better mentor.

I would like to thank Dr. Sylvia Crixell for her assistance reading drafts and providing expert feedback. I would also like to express my thanks to Dr. Amy Meeks for recruiting and encouraging her students to participate in my study. Thank you all!

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ABSTRACT

Although there has been a wealth of anecdotal evidence on Orthorexia nervosa (ON), empirical studies on the topic are surprisingly limited. ON has been described as a pathological fixation on the consumption of healthy food and obsession with proper nutrition. The purpose of this study was to begin to establish a valid scale to measure the phenomenon and to examine the validity of ON as a psychological disorder. This study evaluated the possible overlap between ON and existing DSM disorders that it has been compared to in previous literature, specifically other eating disorders and anxiety disorders. The findings of the study indicate ON shares many important characteristics to eating disorders. Most notably, there were significant positive correlations between ON and anxiety, disordered eating, and attempts to lose weight. Although findings suggest this construct may be part of an eating disorder diagnosis, further research is needed to be able to determine if ON is a distinct construct, part of an existing disorder, or simply a social trend.

I. INTRODUCTION

American society has a dysfunctional relationship with food. As the obesity epidemic continues to soar, eating disorder rates also steadily rise. The cacophony of dietary advice and health trends has left Americans in a state of confusion and anxiety over healthy food choices. According to Michael Pollan's (2006) book, *The Omnivore's Dilemma*, the widespread anxiety about food and weight loss products in America with only growing obesity levels to show from it has resulted in what he deems a "national eating disorder." Despite the abundance of food and the significant number of obese and overweight Americans, many are surprisingly malnourished. The culprit is the overconsumption of processed, energy-dense foods devoid of adequate vitamins and nutrients. In response to the concerning obesity levels, there has been a cultural shift towards eating nutritious, whole foods as a method to achieve weight loss. Although there have been recent positive strides in American society towards healthy eating, it has come with a backlash. Many clinicians and researchers believe this trend toward healthy eating behaviors has been taken to the unhealthy extreme and become problematic.

These eating behaviors that have emerged in the past few decades have invited research and debate into eating behaviors that may be regarded as pathological. Eating disorders such as Anorexia nervosa and Bulimia nervosa have existed for years, but only recently have been formally classified as disorders. Although Orthorexia nervosa is not a formal diagnosis in the *Diagnostic and Statistical Manual of Mental Disorders-V*, it is used to describe a pathological fixation on the consumption of healthy food. Individuals thought to have Orthorexia may exclude foods from their diets they consider to be impure because they have herbicides, pesticides, or artificial substances. This eating pattern has

elicited much recent debate as to whether this is really a unique psychological disorder that masquerades as health, a form of an existing disorder, or simply a new social trend (McInerney-Ernst, 2011).

Origins of Orthorexia Nervosa

Bratman (2000) initially coined the term Orthorexia nervosa (ON), which comes from the Greek words “*orthos*” (pure), and “*orexia*” (appetite). Bratman was a general physician who was on the upswing of the natural eating movement in the United States and saw this phenomenon as a type of eating disorder where the motivation is on food *quality* rather than *quantity*. Bratman contends that in contrast to Anorexia nervosa (AN) where the motivation is weight loss, individuals with ON are compelled by a desire to achieve personal purity and perfection (Bratman, 2000; Mathieu, 2005). However, recent research has suggested that these motivations are also present in individuals with AN (Lilenfeld, Wonderlich, Riso, Crosby, & Mitchell, 2006; Shafran, Cooper, & Fairburn, 2002). Previous research has indicated that many individuals with eating disorders do focus on the quality and types of food they will allow themselves to eat (Affenito, Dohm, Crawford, Daniels, & Striegel-Moore, 2002; Fernstrom, Weltzin, Neuberger, Srinivasagam, & Kaye, 1994; Kummer, Dias, & Teixeira, 2008; Sunday & Halmi, 1996).

Bratman determines that ON can be considered a psychological disorder because of the harmful physical, psychological, and social effects to the individual over time. Similar to individuals with AN, those with ON regard their ability to adhere to a restrictive diet to be a personal achievement of self-discipline and conversely view their deviation from their diet as a major failure of self-control. Although in both AN and ON individuals starve themselves, the ultimate end goals for the individuals are different. ON

individuals are striving to improve or manage their diet by only eating the most biologically pure and nutritious foods, whereas anorexic individuals are concerned with their physical appearance motivated to lose weight by the fear of obesity (Koven & Senbonmatsu, 2013). Additionally, individuals with AN are known to shamefully hide their eating habits, whereas individuals with ON proudly flaunt their habits, seeing them as a sign of superiority.

Physical, Social, and Psychological Consequences of ON

Serious negative physical consequences of ON have been reported due to strict dietary regimens that can result in malnutrition. Individuals thought to suffer from ON may restrict entire food groups from their diet that they may feel are not ideal or that they consider “impure” in some way (McInerney-Ernst, 2011). Although there are not yet empirical studies on the potential long-term physical consequences of ON, Bratman cites cases in which he attributes adverse medical conditions to ON related nutritional deficiencies (Bratman, 2000). Psychologically, individuals spend much of their time and energy thinking about food; planning and preparing foods they consider healthy. If they mistakenly consume a food they consider to be “impure” or “bad” and violate their rules, they may punish themselves with increasingly strict dietary guidelines or self-imposed fasts. These individuals describe the overpowering desire to be entirely pure, natural and healthy that is beginning to take over their entire lives (Bratman, 2000; Mathieu, 2005).

Food becomes the center of the existence of individuals with ON, whether they are organizing, planning, preparing, shopping, or purchasing foods. Because of their strict and rigid lifestyle, individuals thought to suffer with ON experience social withdrawal and isolation. Because they will only eat certain foods and types of foods, they may stop

eating at restaurants or bring their own food from home in public. They may develop a morally superior attitude because of their pure food habits and can experience a growing isolation from their family and friends who do not understand the connection food has with these individuals to their self-concept (Bratman, 2000; Mathieu, 2005).

Background Literature

There has been very limited research worldwide on ON, and the existing research has focused on very limited samples such as a group of medical students, nutrition students, yoga instructors, or performance artists. Even in these relatively homogenous samples, however, the results have been highly variable. Specifically, there is a lack of cumulative systematic investigation studies that build on prior studies. There are instead studies that examine a range of ON variables. Because of this, comparing results across studies is challenging.

For example, a study examining the prevalence rate of ON in a group of Australian female dieticians ($n = 283$, M age = 36.2 years) found the following rates of ON: 52.3% had no ON symptoms, 34.9% showed some symptoms of ON behavior, and 12.8% were considered to have ON. Individuals who had at least some ON behaviors presented as follows: 8.8% of them reported an increase in self-esteem from eating healthy foods, 4.6% felt a sense of guilt or self-loathing when they did not adhere to their diet, 2.5% avoided eating away from home because of food fears, 2.5% avoided eating with other people and 1.1% of them took their food along with them when eating away from home. The authors of this study propose that this confirms that ON seems to be fairly common in dieticians (Kinzl et al., 2006). However, because this study did not contain a control group the results are actually insubstantial.

A study conducted by Bosi and colleagues (2007) evaluated potential ON symptoms in a total of 318 Turkish resident medical doctors (149 female, *M* age range = 27.2 years). The findings from this study indicated 45.5% of the medical residents included in this study were considered to have ON or to exhibit “highly sensitive behavior” (p. 661) towards healthy nutrition and their eating habits (Fidan et al., 2010). The authors of this study suggest explanations as to why ON may be more prevalent in this population, including the fact that doctors have a greater knowledge of the effects of nutrition on health.

Another study examined the relationship between ON and fitness in Sweden, and included 251 participants who were involved in fitness routines (166 female, *M* age for men = 28 years, *M* age for women = 32 years). Of these participants, 66% of the men and 54% of the women exercised 3-4 times each week. The results of this study indicated that for females only, more ON symptoms were found in individuals who exercised more frequently (Eriksson, Baigi, Marklund, & Lindgren, 2008). Although this is the only study to examine the possible relationship between ON and exercise level, the findings show there may be a link between these lifestyles and provides a direction for additional research to be conducted.

Aksoydan and Camci (2009) investigated ON symptoms in a group of Turkish performance artists. Of the 94 participants, 46.8 % were opera singers, 29.8% were ballet dancers, and 24% were symphony orchestra musicians. The findings of this study were that overall 54.6% of participants had ON symptoms. The opera singers were the group of performance artists to have the highest rate of ON, at 81.8%. The second highest prevalence of ON was the symphony orchestra musicians at 36.4% then the ballet dancers

at 32.1%. The high levels of ON found in these individuals suggests this eating pattern may be prevalent in those involved in the performing arts. These results from all of these studies overall though are only from a few preliminary studies on a limited sample of individuals and not substantial enough to draw conclusions based on the data alone.

Finally, one study has been conducted in the United States as a dissertation. McInerney-Ernst (2011) conducted research on 163 students at the University of Missouri at Kansas City. Her data incorporated self-reported responses to measures of demographic factors, lifestyle, anxiety, obsessive-compulsive disorder, eating disorders and health concerns. McInerney-Ernst found that as much as 82% of her sample met the criteria for ON, based on Donini's (2004) cut-off of 40 on the ORTO-15 which measures ON symptoms (Shah, 2012). Her study found that ON shares many characteristics with established eating disorders, such as eating concerns and worry about the food one has eaten. Her results found the measure has poor internal consistency, and coupled with the significantly high number of participants in the sample who met the criteria for ON, it can be determined that the ORTO-15 measure is not valid for an American sample (Shah, 2012).

There remains a shortage of studies on both the contributing risk factors as well as how to classify this hypothesized "disorder". The data on other epidemiological factors is unclear, with inconsistent findings for the relationship between ON and age, weight, education level, marital status, and lifestyle factors such as weight control, smoking, and alcohol consumption.

The existing research has significant limitations. First, nearly all the existing studies involve individuals in either European or Eastern cultures. There is only one existing

research study done on an American sample, which was a dissertation. Given the present cultural shift in the United States towards a healthy lifestyle, it is crucial that the prevalence of ON be further evaluated in an American population.

Additionally, nearly all of the existing studies have depended on Bratman's (2000) general conceptualization of ON as a "fixation on healthy food" (p. 9) and obsession for proper nutrition that focuses on food quality rather than quantity. Bratman was the first to coin the term ON in 1997, and none of the studies since have sought to expand or redefine this interpretation into an operational definition for ON. Because studies are relying on a measure with limited psychometric properties, they should be interpreted with caution. The majority of Bratman's tests are very subjective, and the wording of each question may be interpreted differently based on the test taker (Shah, 2012). The first question of Bratman's test ("Do you spend more than three hours a day thinking about healthy food?") seems to be straightforward, but the term "healthy" can mean something entirely different to each test taker.

Despite these critiques and limited psychometric properties, a few studies have translated Bratman's questionnaire into different languages to use in studies (Shah, 2012; Kinzl et al., 2006; Korinth et al., 2009). Donini and colleagues (2004) developed their own questionnaire with the goal to diagnose and measure the phenomenon modeled off of Bratman's (1997) scale for their ORTO-15. Donini and colleagues determined that in their Italian culture, questions are rarely designed in a dichotomous response. They adapted Bratman's original test on a 4-point Likert scale with "Always," "Often," "Sometimes," and "Never," as possible answers and added five questions of their own (Shah, 2012).

Finally, there remains a continuing debate as to whether ON is a unique psychological disorder, a form of an existing disorder, or just a social trend (McInerney-Ernst, 2011). Some clinicians argue ON is a unique form of an eating disorder, while others insist it is an obsession as found in obsessive-compulsive disorder. It has also been argued that ON is not a real disorder, rather a societal trend stemming from the major recent cultural shift promoting healthy eating. Research on ON has only begun to skim the surface and has not yet established construct validity; therefore, it is too soon to make any sweeping conclusions about the nature of this eating behavior (McInerney-Ernst, 2011). Because of the cultural emphasis on fighting obesity and the push towards healthy eating, it is essential to better understand ON to help classify individuals who take healthy eating to the unhealthy extreme.

Eating Disorders and Orthorexia Nervosa

The majority of studies conducted on ON struggle to classify this phenomenon into a diagnosis. It is unclear whether ON is an eating disorder, a separate disorder, or even a disorder at all. Although many studies address this issue, none of them have produced a clear consensus. A few studies highlight that ON shares many characteristics with AN (Fidan, 2010). Commonly shared characteristics are high anxiety, a need to control external environment and a possible genetic predisposition for perfectionism. Bratman (2000) who initially coined the term thought it should be categorized as a unique eating disorder. He also acknowledged there is an overlap between ON and AN, and compared their chronic nature. Martins et al. looked at the differences in motivation that distinguishes ON from eating disorders (2011). For example, individuals with AN and BN are motivated by weight loss, whereas individuals with ON are motivated by goals of

achieving a healthy, pure diet. Martins also suggested that treatment resistance may be lower in individuals with ON compared to eating disorders. Because eating disorders are ego-syntonic disorders, individuals are less aware that their behaviors are unhealthy and more likely to deny the existence of the disorder as well as its severity (Polivy & Herman, 2002). However, based on Bratman's research, individuals with ON could also deny their symptoms because they see their diet as healthy and cannot fathom negative consequences of their clean eating habits. Martin's findings suggest that ON should be treated as a separate construct than eating disorders. Though these symptoms do suggest there is some overlap with AN, the criteria of low weight, amenorrhea and compensatory behaviors are typically not met with ON. Some have proposed ON may instead be a risk factor that can lead to the development of a full-blown eating disorder (MacEvelly, 2001). It has also been speculated that individuals who are in recovery from an eating disorder may turn to ON behaviors in order to hold on to certain behaviors.

One study looked at a list of "new" eating proposed eating disorders that have cropped up and attempted to gain recognition in the DSM-5. Night Eating Syndrome, Muscle Dysmorphia, Emetophobia (fear of choking), and Orthorexia were studied in terms of the amount of attention they were receiving in the popular media versus professionals (Vandereyckn, 2011). Vandereyckn found the most commonly known disorder to be ON, and the least commonly known to be Night Eating Syndrome. It is apparent from this study that although ON is a familiar term, there is a significant lack of clear empirical research and more studies need to be conducted. Because existing conclusions related to whether or not ON is a unique disorder is largely based on

anecdotal evidence, more research is needed to effectively compare eating disorders with ON.

Anxiety Disorders and Orthorexia Nervosa

Another argument, based on anecdotal evidence, argues that ON would be better classified as an anxiety disorder, specifically a variant of obsessive-compulsive disorder (OCD; Bratman, 2000; Mathieu, 2005; McInerney-Ernst, 2011). Bratman describes in his original book what he noted to be a rigid adherence to dietary requirements: carefully weighing all consumed food, engaging in excessive planning of meals, and suffering from feelings of guilt when one diverges from their self-imposed dietary guidelines (Shah, 2012). In individuals thought to have ON, the “pure” eating behaviors are the obsessive feature of OCD (Mathieu, 2005). Other clinicians point to limited empirical evidence, which argues that anxiety, need for control and striving for perfection are present in ON and common characteristics of OCD (Donini et al., 2004; Mathieu, 2005; Kinzl, Hauer, Traweger, & Kiefer, 2006; McInerney-Ernst, 2011). However, according to specific *DSM-V* (2013) criteria, the official diagnosis of OCD must also include other important symptoms such as bizarre obsessions the individual realizes are obsessive and repetitive behaviors to suppress the thoughts (McInerney-Ernst, 2011).

In summary, the diagnostic nature of ON remains unclear. Remarkably binge-eating disorder took sixty years to be officially recognized as a diagnosis, so it remains unclear if ON will follow a similar trajectory. Further research is needed to determine whether ON is a unique psychological disorder, or an existing psychological disorder. While some clinicians contend that ON is a unique form of eating disorder, others argue it to be one form of obsession found in OCD. Yet, others have claimed ON to be a societal trend

instead of a psychological disorder. There remains widespread debate over the exact nature of this phenomenon, and further research is needed in order to come to a better understanding of this complex issue.

Purpose of the Study

Despite the recent media attention ON has gained, few studies have been conducted to better understand the nature of this eating pattern. Therefore, I sought to explore this largely unstudied phenomenon in an attempt to understand and create an inventory to begin to measure this eating behavior. The purpose of this study was to first serve as a preliminary step to better understand the overall nature of this potential disorder, further advancing current knowledge about ON as a potential psychological disorder. A second purpose of the study was to begin to evaluate the validity of ON as a psychological construct by evaluating the relationship between ON as a measure compared to measures of self-reported anxiety, disordered eating patterns and ON symptoms using a US college sample.

Research Questions

One of the central goals of this study was to investigate the relationship between ON and disordered eating behaviors, specifically food preoccupation that is characteristic of bulimia, caloric restriction that is characteristic of anorexia, and excessive dieting attempts. Related to the aforementioned goal is a second goal of examining whether ON symptomology is greater for those who diet for the purpose of losing weight (by managing their diet, taking diet pills, or participating in an organized weight loss program), irrespective of any eating disorder. Another aim was to explore the relationship between ON and potentially relevant health-behavior factors such as BMI, exercise

frequency, anxiety, and caffeine and alcohol consumption. Finally, I wanted to also explore the differences between the demographic gender and ethnicity groups in relation to ON symptoms.

II. METHOD

Participants and Procedure

A sample of 294 Texas State University undergraduates participated in this study by completing an online survey through Qualtrics in exchange for extra credit in one of their psychology courses in the Spring of 2015. The majority of the participants were female (80.6%) and the mean age for males and females was 20.55 ($SD = 2.76$, range 18-39 years). Thirty-seven percent identified their ethnicity as Caucasian, 31.0% were Hispanic, 14.3% were African American, 3.4% were Asian or Pacific Islander, 0.3% were Native American, and 13.9% were Other or Multi-Ethnic.

Measures

The online survey (see Appendix) given to each participant contained four measures: (1) Demographics Questionnaire, (2) Orthorexia Scale, a scale to measure ON symptoms, (3) Beck Anxiety Inventory, and (4) Eating Attitudes Test.

Demographic Questionnaire

Participants completed a demographic questionnaire, which included questions about age, sex, level of education, ethnicity, marital status, weight, height, exercise habits, tobacco use, alcohol use, and caffeinated beverage intake. The participants' height and weight were used to calculate their BMI using the National Institute of Health's (2008) BMI calculator which uses the standard formula, $BMI = \text{weight (pounds)} * 703 / \text{height squared (inches}^2\text{)}$.

Orthorexia Scale

The Orthorexia Scale is a self-report measure of symptoms of ON that consists of 11 items. The items are rated on a 5-point Likert scale with the following response

options: “Always”, “Most of the Time”, “Sometimes”, “Rarely”, and “Never”. This scale was based off of Bratman’s original scale in his book *Health Food Junkies* (Bratman & Knight, 2001) and ORTO-15 (Donini et al., 2005). Although ORTO-15 is currently the most commonly used assessment of ON symptoms, this measure’s psychometric properties and overall reliability are very limited (McInerney-Ernst, 2011). Because of this scale’s limitations in measuring ON, in the current study, I create a revised scale with the goal of creating a scale with better predictive ability. Six of the questions in this measure were taken from Bratman’s original scale, three were taken from ORTO-15, and two new questions were added. Results of a factor analysis on this scale are provided in the results section of this thesis document.

Beck Anxiety Inventory

The Beck Anxiety Inventory (BAT; Beck, Epstein, Brown, & Steer, 1988) is a composed of 21 self-report questions that measure the severity of an individual’s anxiety symptoms. This scale measures two factors: *somatic*, which includes physiological symptoms, such as “numbness or tingling” and *subjective anxiety and panic*, which includes “fear of the worst happening” (Beck et al., 1988). Each question has four possible responses from “Not at All”, “Mildly”, “Moderately”, and “Severely”, and has a maximum score of 63.

Eating Attitudes Test

The Eating Attitudes Test-26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) is a scale used to screen individuals who have indicated some form of eating disordered behavior. This instrument is not meant to diagnose; rather it is a way to determine whether further testing is needed to make an eating disorder diagnosis. There

are three different subscales in the EAT-26: Dieting, Bulimia and Food Preoccupation, and Oral Control. Participants answer on a 6-point Likert scale with the following response options: Always=3, Usually=2, Often=1, Sometimes=0, Rarely=0, and Never=0. Only one question is scored in the reverse matter. The total points are calculated, and a total score of greater than 20 is where significant disordered eating symptomology is usually present. The EAT-26 is one of the most widely used measures to screen symptoms of disordered eating. The original validation study of the EAT-26 showed that the three subscales were interrelated and are reliable, making this scale a valid and economical instrument to use as an objective measures of the symptoms of AN and BN (Garner et al., 1982).

III. RESULTS

A principal component analysis was used to determine the validity of the ON scale. Of the 14 total items, 11 questions predominantly loaded into a single factor that seemed to address the ON construct. The remaining 3 items predominantly loaded onto a second factor of mood and quality of life, and because these items assessed a different albeit related construct, they were excluded in the final ON scale. The correlational data for the scale are located in Table 1. This final ON scale showed a high level of internal consistency (11 items; Cronbach's $\alpha = .83$).

Table 1

Correlations Between Individual ON Items and Total Score

Item	<i>r</i>
Items loading predominantly onto Component 1	
Do you give up foods that you used to enjoy in order to eat the 'right' foods?	.71
Is the nutritional value of your meal more important than the pleasure of eating it?	.65
In terms of dieting or eating healthy, are you stricter with yourself than you used to be?	.64
Do you feel guilty when you stray from your diet?	.64
Does your diet make it difficult for you to eat out, distancing you from family and friends?	.63
Does your self-esteem get a boost from eating healthily?	.59
Do you feel at peace with yourself and in total control when you eat healthily?	.54
Are you willing to spend more money to have healthier food?	.54
Do you eat fewer kinds of foods than you used to?	.54
Do you consume more diet supplements, herbal remedies, or probiotics than you used to?	.54
Do you plan your meals several days ahead?	.53
Items loading predominantly onto Component 2	
Does the thought about food worry you for more than three hours a day?	.46
Does the quality of your life decrease as the quality of your diet increases?	.42
Do you think your mood affects your eating behavior?	.37

A series of Pearson correlation analyses were conducted to assess the relationship between ON and the four subscale scores of the EAT-26, BMI, anxiety, exercise frequency, and consumption of alcohol and caffeine. ON was significantly, positively correlated with the disordered eating scales of bulimia and food preoccupation, oral control, dieting for weight loss, and dieting with healthy foods. Symptoms of ON were also significantly, positively correlated with exercise frequency, BMI, and anxiety scores. Intake of caffeine and alcohol were not significantly correlated with symptoms of ON. The data for these correlations are located below in Table 2.

To determine group differences within ON scores, independent samples t-tests were conducted to assess which factors correlate with ON. The results of these analyses are shown in Table 3.

Table 2
Correlations Between ON and Other Continuous Variables

Variable	<i>r</i>	<i>P</i>
EAT-26 scales		
Bulimia and food preoccupation scale	.26	< .001**
Oral control scale	.28	< .001**
Dieting for weight loss scale	.45	< .001**
Dieting with healthy foods scale	.31	< .001**
Exercise frequency	.23	< .001**
Alcohol consumed	-.08	.17
Caffeine consumed	.07	.26
Anxiety	.14	.02*
BMI	.12	.05*

* $p < .05$. ** $p < .001$.

Table 3

t Tests Assessing Group Differences in ON Scores

Variable	<i>n</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>P</i>
Gender				-0.49	288	.62
Men	54	33.83	7.27			
Women	236	33.29	7.32			
Trying to lose weight?				-6.36	290	< .001**
Yes	190	35.26	6.61			
No	102	29.92	7.24			
Managing diet?				-7.04	290	< .001**
Yes	168	35.78	6.15			
No	124	30.16	7.47			
Engaging in exercise?				-6.08	290	< .001**
Yes	170	35.46	6.85			
No	122	30.51	6.91			
Taking diet pills?				-2.90	290	.004*
Yes	27	37.22	7.09			
No	265	33.00	7.20			
In weight loss program?				-1.84	290	.07
Yes	9	37.78	9.64			
No	283	33.25	7.18			

p* < .05. *p* < .001.

The mean scores for ON were almost equal among male and female participants. Participants who reported trying to lose weight had significantly greater ON scores than those who were not trying to lose weight. Participants who reported attempts to manage their diet scored significantly higher on the ON scale than those who were not managing their diet. Participants who reported engaging in exercise scored significantly higher on the ON measure than those who were not exercising. Participants who reported taking

diet pills scored significantly higher on scores of ON than those who were not taking diet pills. However, participants who reported being involved in a weight loss program did not have significantly higher ON scores than those who were not in such a program.

Finally, a one-way ANOVA was performed to compare the differences in ON scores for ethnicity. Among ON scores for participants who identified themselves as Caucasian, Hispanic or Latino, and African American, there was no statistically significant difference. The results for this analysis are shown below in Table 4.

Table 4
ANOVA Assessing Ethnic Group Differences in ON Scores

Variable	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>df</i>	<i>P</i>
Ethnicity				2.98	2, 237	.053
Caucasian	108	33.19	6.80			
Hispanic/Latino	91	34.14	7.29			
African American	41	33.15	7.82			

V. DISCUSSION

Discussion of Results

A central purpose of this study was to add to the limited research available [about](#) ON and to develop a more valid scale to measure this phenomenon. Despite the recent increased interest in this eating pattern, there remains a lack of research on this topic to fully understand how this potential disorder needs to be classified.

One of the primary research questions was to determine if there was a relationship between ON and disordered eating behaviors. ON symptoms were closely correlated with disordered eating behaviors, in particular caloric restriction that is characteristic of anorexic behaviors, food preoccupation and corresponding bulimic behaviors, and excessive dieting attempts. The significant overlap between these disordered eating symptoms and ON symptoms suggests ON may be best classified as a type of eating disorder. A higher score on these disordered eating measures typically indicates a greater likelihood that the individual may have an eating disorder. Because the high scores for these measures were correlated with high ON scores, this relationship indicates eating disordered behavior and ON symptomology may be part of the same construct. Consistent with this claim, several studies have referred to ON as a type of eating disorder, including Bratman (2000) who initially coined this term.

Related to the aforementioned goal was a second goal of examining whether ON symptomology is greater for those who diet for the purpose of losing weight (by managing their diet, taking diet pills, or participating in an organized weight loss program), irrespective of any eating disorder. High ON scores were highly correlated with efforts to lose weight. This finding was surprising considering the main objective of

ON is health and adhering to a pure diet, rather than weight loss. This high correlation with efforts to lose weight again suggests that ON may be better classified as an eating disorder because the hallmarks of both AN and BN are desire and efforts to lose weight. Similarly, individuals who scored high on the ON scale also scored high on attempts to manage their diet. This finding was an expected result considering that the main symptom of ON is managing their diet to make it as biologically pure and perfect as possible.

A third goal of this study was to investigate the relationship between ON and potentially relevant health-behavior factors, such as BMI, exercise frequency, anxiety, and caffeine and alcohol consumption. First, individuals' BMI's were positively correlated with ON symptoms, suggesting that individuals who scored high on ON symptoms more likely have a greater weight for their height. This finding is somewhat expected and could be related to the correlation between ON and wanting to lose weight, if these high-ON individuals are trying to be healthier in their eating habits in order to lose weight as needed to be healthy physically. Second, individuals with higher ON scores also reported a higher exercise frequency than those who scored lower. This finding was expected considering that individuals with high ON scores are again ultimately concerned with their physical health, which would likely include an exercise regimen. Third, higher self-reported scores of anxiety were also highly correlated with ON symptoms, which suggests that ON may be more than a mere social trend. Eating disorders commonly co-occur with anxiety disorders, which may be another indicator that ON would be best classified as a type of eating disorder. Finally, both alcohol and caffeine consumption had no significant correlation with ON scores, suggesting they

those who are high in ON are not necessarily concerned with drinking alcohol or caffeine.

Last, the fourth goal of the study was to examine the differences in ethnicity and gender in relation to ON scores. There was no significant difference between ON scores and ethnicity, with the scores among participants that identified themselves as Caucasian, Hispanic or Latino, and African American all being fairly consistent. This finding was surprising considering that eating disorders are commonly characterized as a Western-cultural phenomenon among Caucasian females (Davis & Yager, 1992; Miller & Pumariega, 2014). This finding suggests that ON may be best classified as a separate eating disorder diagnosis rather than grouped under AN or BN. This finding is further surprising considering that the healthy eating behaviors have been shown to differ by ethnicity. According to a nutrition study that calculated individuals' healthy eating indexes, or overall quality of an individual's diets, African Americans were more often classified as having a poor diet compared to Hispanic and Caucasian participants (Guo et al., 2004).

Similarly with gender, the scores between males and females were also statistically equivalent. This finding was an unexpected result because women are exceedingly more likely than males to develop an eating disorder with only an estimated 5-15% of AN and BN sufferers being male. This finding indicates that this eating phenomenon may be better classified as a new eating disorder subtype rather than clustered with the established AN, BN, or binge eating disorder. The lack of difference between genders was also surprising since women were shown to possess a greater

healthy eating index than males when Guo and colleagues (2004) compared the nutritious intake of their diets.

Practical Applications

In the present study, we began to evaluate the diagnostic area of ON symptoms in an America college sample. By working towards developing a valid scale for this phenomenon, those at risk or who score high on this scale can more easily determine whether they may need to seek psychological and medical help. A valid diagnostic scale can help those uncertain as to whether ON is problematic in their lives and provide a term for the symptomology they experience to better seek out care. Furthermore, developing a scale is the preliminary step towards evaluating if ON is a psychological disorder and needs to be introduced to the DSM as a formal diagnosis.

Strengths and Limitations

Because this study was among one of the first investigating the symptoms of ON and the first using this particular ON scale, these results are still preliminary in nature. This scale has only been used once and although it has demonstrated strong internal validity, more studies need to be conducted to establish a greater baseline. A strong internal validity is only correlational, and because this does not tell us the cause of this purported disorder, we have to take the results with this in mind. Because ON is still in the process of being categorized and fully understood, more studies need to be conducted to develop a more comprehensive understanding of the makeup of this proposed disorder. Another limitation of this study is that we only used students from a central Texas university; therefore, results may vary across the country at different universities in more diverse areas of the country. Additionally, all data were collected via self-report

measures, which are subject to participants under-reporting the severity of their symptoms to appear in a more favorable light. Despite these limitations, the large sample size was a major strength of this study, as the results have a greater reliability than with a smaller sample. The validity of the ON scale was another factor that added positively to the overall quality of this study and the conclusions that may be drawn from it.

Implications for Future Research

Because research on the topic of ON and whether it can be considered a disorder is still in the preliminary stages, there remains a wealth of future research to be explored. Future studies should continue to test for a valid scale that can be used to screen for the likelihood of ON, as well as begin to further delineate a diagnosis. After a final instrument has been repeatedly tested and proved to be effective, a cut-off score can be established to indicate the likelihood to which ON is present. Once a general understanding of this construct has been established, future studies should include qualitative studies to examine the degree to which this phenomenon appears to be interfering with the daily lives and functioning of individuals. Based on this evidence, the best course of treatment to properly address and treat this issue can be determined.

Conclusion

In summary, the recent interest that has emerged around this new disordered eating pattern has elicited debate as to whether it should be regarded as pathological. The findings from this study indicate that ON shares many critically important characteristics with established eating disorders. However, given the lack of differences in ON symptoms between the two genders and among different ethnic groups, ON may be an eating disorder that is distinct from AN and ON. Until more research is conducted,

though, making any conclusive classification of ON as a psychological disorder at the present time is premature given that studies have only made preliminary strides towards the process of developing a psychological diagnosis (Blashfield et al., 1990; Kendall & Jablensky, 2003; Shah, 2012). Given the current cultural climate that puts a heavy emphasis on health and wellness, it is vital that the underlying mechanisms of ON are better understood through continued empirical and systematic research before labeling these eating patterns as pathological.

APPENDIX

Demographics Questionnaire

What is your gender?

Male Female

Current Age: _____

What is your highest level of education?

High school graduate Associate degree Bachelor's degree some college credit,
no degree Master's degree Doctorate Degree

Which best describes your ethnic background? (Check all that apply)

White/Caucasian Black/African American Hispanic/Latino Asian/Pacific
Islander American Indian/Alaskan Native Other or Multiple Race/Ethnicity

What is your current marital status?

Single Married Cohabiting Separated Divorced Widowed

How much do you currently weigh? _____

How tall are you? _____ feet and _____ inches

Are you currently trying to lose weight?

No Yes

If so, please check all the methods of weight control you are currently involved in

managing diet
 engaging in exercise
 taking diet pills
 involved in a weight loss program (i.e. Weight Watchers)

How often do you exercise *each week*? _____

What has been your *lowest* weight as an adult? _____

What has been your *highest* weight as an adult? _____

Do you currently smoke cigarettes? No Yes

If so, about how many cigarettes do you smoke *each day*? _____

Do you currently drink alcohol? No Yes

If so, about how many alcoholic beverages do you drink *weekly*? _____

Do you currently consume caffeine? No Yes

If so, about how many caffeinated beverages do you have each day? _____

Orthorexia Scale

The following 14 questions are relevant to Orthorexia nervosa. When selecting your response, only consider how you felt and ate during the past month, including today.

1. Does the thought about food worry you for more than three hours a day? *
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
2. Do you think your mood affects your eating behavior? *
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
3. Do you plan your meals several days ahead?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
4. Is the nutritional value of your meal more important than the pleasure of eating it?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
5. Has the quality of your life decreased as the quality of your diet has increased? *
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
6. Have you become stricter with yourself lately?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
7. Does your self-esteem get a boost from eating healthily?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
8. Have you given up foods you used to enjoy in order to eat the 'right' foods?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
9. Does your diet make it difficult for you to eat out, distancing you from family and friends?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
10. Do you feel guilty when you stray from your diet?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
11. Do you feel at peace with yourself and in total control when you eat healthily?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
12. Are you willing to spend more money to have healthier food?
a. Always b. Most of the Time c. Sometimes d. Rarely e. Never

13. Has the kinds of foods you allow yourself to eat shrunk?
 a. Always b. Most of the Time c. Sometimes d. Rarely e. Never
14. Have you increased your consumption of dietary supplements, herbal remedies, or probiotics?
 a. Always b. Most of the Time c. Sometimes d. Rarely e. Never

* These three questions have been omitted from the scale.

Beck Anxiety Inventory

Please record the response that indicates how much you have been bothered by the given anxiety symptom during the past month, including today.

- | | | | | |
|----|-------------------------|-----------------------------------|--|---------------------------------|
| 1. | Numbness or tingling | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |
| 2. | Feeling hot | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |
| 3. | Wobbliness in legs | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |
| 4. | Unable to relax | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |
| 5. | Fear of worst happening | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |
| 6. | Dizzy or lightheaded | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |
| 7. | Heart pounding / racing | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |
| 8. | Unsteady | | | |
| | a. Not at all | b. Mildly - didn't bother me much | c. Moderately - wasn't pleasant at times | d. Severely - bothered me a lot |

9. Terrified or afraid
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
10. Nervous
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
11. Feeling of choking
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
12. Hands trembling
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
13. Shaky / unsteady
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
14. Fear of losing control
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
15. Difficulty in breathing
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
16. Fear of dying
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
17. Scared
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
18. Indigestion
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
19. Faint / lightheaded
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot

20. Face flushed
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot
21. Hot/cold sweats
 a. Not at all b. Mildly - didn't bother me much c. Moderately - wasn't pleasant at times d. Severely - bothered me a lot

Eating Attitudes Test

For each statement below, circle the response that indicates how often you feel the way that is indicated in the statement.

1. Am terrified about being overweight
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
2. Avoid eating when I am hungry
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
3. Find myself preoccupied with food
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
4. Have gone on eating binges where I feel I may not be able to stop
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
5. Cut my food into small pieces
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
6. Aware of the calorie content of foods I eat
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
7. Avoid food with high a carbohydrate content (bread, rice, potatoes, etc.)
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
8. Feel that others would prefer if I ate more
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
9. Vomit after I have eaten
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
10. Feel extremely guilty after eating
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
11. Am preoccupied with a desire to be thinner
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never

12. Think about burning up calories when I exercise
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
13. Other people think I'm too thin
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
14. Am preoccupied with the thought of having fat on my body
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
15. Take longer than others to eat my meals
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
16. Avoid foods with sugar
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
17. Eat diet foods
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
18. Feel that food controls my life
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
19. Display self-control around food
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
20. Feel that others pressure me to eat
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
21. Give too much time and thought to food
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
22. Feel uncomfortable after eating sweets
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
23. Engage in dieting behavior
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
24. Like my stomach to be empty
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
25. Have the impulse to vomit after meals
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never
26. Enjoy trying new rich foods
 a. Always b. Usually c. Often d. Sometimes d. Rarely e. Never

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