

THE RELATIONSHIP BETWEEN SEXUAL DEBUT AND EATING ATTITUDES

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May 2019

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Acknowledgements

I would like to thank my extraordinary advisors, without their guidance and patience none of this would have been possible. Ariel Handy for mentoring me both in my research and outside of the laboratory, I am nothing but grateful for her constant support. Dr. Quimby for sparking my interest in developmental theory and allowing me the opportunity to write on a topic I have great interest towards. Dr. Cindy Meston for giving me the opportunity to begin my pursuit of research in her lab three years ago.

I would also like to thank my sister, Maddie, and the rest of my friends and family for their encouragement and support. Finally, I would like to thank all of the people who participated in this study. Without their willingness to share, this research would not have been possible.

Abstract

Sexual debut is defined as the first time an individual engages in penetrative sexual intercourse. This experience, if negative, has been associated with adverse outcomes such as substance abuse, delinquency, depressive symptoms, and negative self-schemas. The purpose of this study was to expand the literature on sexual debut by exploring specific aspects of sexual debut (ie. age at sexual debut, and nonconsensual or consensual sexual debut) and their relationship with eating attitudes and behaviors. Participants ($N=448$) completed a single session online survey that measured sexual debut, self-esteem, body satisfaction, body esteem and eating attitudes and behaviors. A nonconsensual sexual encounter at sexual debut significantly predicted higher levels of disordered eating attitudes and behaviors. This relationship was mediated by variables of self-esteem and body satisfaction. Understanding sexual debut as a contributor to disordered eating and other variables that affect this relationship can be valuable in expanding the literature on the development of disordered eating as well as women's sexual health and well-being.

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Introduction

Hypotheses

The current study will examine how an individual's sexual debut, defined as first penetrative sexual experience, may impact the development of disordered eating behaviors later in life. The study will address three questions: (1) does an individual's age (early, normative, late) at sexual debut effect the likelihood of developing disordered eating attitudes and behaviors? (2) Does a nonconsensual sexual debut effect the development of disordered eating attitudes and behaviors? (3) Does body satisfaction, body esteem, or self-esteem mediate the relationship between age at sexual debut and disordered eating attitudes or consent at sexual debut and eating attitudes?

Significance of the Study

This study aims to add to the literature on eating disorder development for the benefit of patients with eating disorders, clinicians treating eating disorders, and researchers investigating disordered eating development. The inconsistent findings amongst eating disorder studies make it challenging to determine potential pathways of eating disorder development, hindering the development of effective and targeted eating disorder treatments for patients. This study seeks to establish significant mediating variables which can explain the potential relationship between sexual debut characteristics, such as age and consent at sexual debut, and the outcome of disordered eating. The ability to identify mediating variables in eating disorder development offers significant implications for the research community as well as clinical applications. These findings are applicable to treatment for eating disorder patients or the implementation of preventative measures for individuals that have yet to develop disordered eating but are at higher risk than the general population. Being able to identify which factors could place individuals at

higher risk for eating disorder development, such as adverse or atypical sexual debut, allows for people to seek resources earlier to help protect against disordered eating. Ultimately, this study aims to contribute to the progression of eating disorder research and the implications of future findings.

Review of the Literature

Eating Disorders and Subtypes

There are three distinct types of eating disorders that have been intensely studied which include anorexia nervosa, bulimia nervosa, and binge-eating disorder. *Anorexia nervosa* (AN) is classified by the DSM-5 as the persistent restriction of energy intake that leads to low body weight, intense fear of gaining weight or being fat, and body shape disturbance (American Psychiatric Association, 2013). The AN disorder consists of two separate subtypes which are the binge-purge subtype and the restricting subtype. These two subtypes are differentiated by the presence of *purging* through the use of self-induced vomiting or the improper use of substances such as laxatives or diuretics. This behavior is present in the binge-purge subtype, but not in the restrictive subtype.

Bulimia nervosa (BN) is characterized by recurrent episodes of *binge eating*, consuming an extraordinary amount of food at one time, followed by recurrent inappropriate compensatory behaviors to prevent weight gain from a binge eating occurrence. These compensatory behaviors can include engaging in extreme amounts of exercise, self-induced vomiting, misuse of laxatives, enemas, diuretics, fasting or strict dietary restriction. Two subtypes exist under BN, the purging, and non-purging subtypes. These subtypes are classified by the type of compensatory behavior an individual uses following an episode of bingeing. The purging subtype includes behaviors that forcibly expel food from one's body such as self-induced vomiting, or misuse of laxatives, enemas, and diuretics. The non-purging subtype is classified as compensatory behavior that does not involve any purging. These non-purging behaviors consist of excessive exercise, fasting, and strict dietary restriction. Binge eating episodes in BN must occur in a discrete time frame where a person eats much more than what is relatively normal and feel as if they are uncontrollable,

while the compensatory behaviors can range greatly. In order to be diagnosed with BN, the binge-eating and the compensatory behaviors need to occur at least once a week for three months (American Psychiatric Association, 2013).

Individuals with *binge-eating disorder* (BED) must display recurrent binge eating episodes where an individual consumes much more than what would be comparatively normal and feels as if they are unable to stop. The bingeing episodes in BED are also associated with eating more rapidly than normal, eating until uncomfortably full, eating large amounts of food when not physically hungry, eating alone or in secret due to embarrassment about how much one is consuming and feeling disgusted by oneself or guilty following a binge episode (American Psychiatric Association, 2013). The lack of any type of compensatory behavior is what differentiates BED from BN.

Prevalence of Eating Disorders

Eating disorders are a serious mental illness that affect an extensive group of people. It is estimated that 30 million people in the United States suffer from some form of disordered eating (Le Grange, Swanson, Crow & Merikangas, 2012). Eating disorders are more commonly seen in women than men, as the ratio for diagnosis of an eating disorder is 5:1 (Striegel-Moore, Rosselli, Perrin, Debar, Wilson, May & Kraemer, 2009). Yet, there is a significantly unrecognized group of men who also develop disordered eating. Ten percent of men have been diagnosed with an eating disorder, though this number, in reality, may be higher, as it is suspected that a large number of men do not seek treatment (Sweeting, Walker, MacLean, Patterson, Räisänen & Hunt, 2015). The least prevalent type of eating disorder is AN with only 0.9% of the population diagnosed though it is the most fatal, while BN is more frequently diagnosed with a 1.5% lifetime prevalence (Eating Disorders Coalition, 2016). In comparison to AN and BN, BED is

the most frequently diagnosed eating disorder of the three since 2.8% of the United States population will suffer from this type of eating disorder throughout their lifetime (Hudson, Hiripi, Pope & Kessler, 2007).

Age of Onset of Eating Disorders

Eating disorders can develop at any time in an individual's life, however, the onset of disordered eating most often occurs in either early puberty or early adulthood (Patriciello, Monteleone, Monteleone, Amodio, Calvanese & Volpe, 2017). Based on diagnostic interview data from the National Comorbidity Survey Replication (NCS-R), the median age of onset was 21 years-old for binge eating disorder and 18 years-old for both bulimia nervosa and anorexia nervosa (National Institute of Mental Health, 2018). Puberty or adolescence is considered to be a period of especially heightened risk for eating disorder development due to environmental factors and quickly changing physical development that individuals in this stage of life experience (Klump, 2013). Research shows that the environmental sources of risk arise from psychosocial factors including increased body dissatisfaction, decreased self-esteem, weight concerns, and dieting evolving from pubertal development and changes in the body (Fornari & Dancyger, 2003). More recent research has focused on potential biological and genetic risk factors that are heightened during adolescent development and the pubertal transition. The role of ovarian hormones and estrogen activation at puberty is speculated to contribute to a heightened period of risk to develop eating disorders (Klump, 2013). However, these findings only pertain to females as research regarding males and hormonal changes in puberty do not seem to have the same significance.

Impact of Eating Disorders

The increased attention to the investigation of eating disorders is warranted because of the prevalence within the population and the severe outcomes of the disorder. Eating disorders have one of the highest mortality rates amongst all mental health disorders (Eating Disorders Coalition, 2016), with a 0.51% annual mortality rate (Smink, Van Hoeken & Hoek, 2012). In addition to high mortality rates, the economic impact of eating disorders is far-reaching. Eating disorders have individual and societal financial effects. Individuals have a difficult time paying for expensive treatments that may take considerable time. A recent study found that on average patients in the United States with eating disorders needing outpatient care have annual health care costs that are \$1,869 dollars greater than people that do not have an eating disorder (Samnaliev, Noh, Sonnevile & Austin, 2015). However, patients with eating disorders needing inpatient care have expenses that far surpass that amount. People receiving inpatient care for eating disorders on average had to pay \$38,800 US dollars for their hospital stay (Toulaney, Wong, Katzman, Akseer, Steinegger, Hancock-Howard & Coyte, 2015). This extreme economic burden is often not covered fully by insurance providers. Eating disorders have also been associated with lower rates of employment and lower earnings (Samnaliev, Noh, Sonnevile & Austin, 2015). These findings suggest significant societal economic impacts from the growing prevalence of eating disorders within the United States. Treatment and prevention of EDs may have broad economic benefits for society as well as the individual. Economic accompany emotional burdens for patients with eating disorders and their families and friends. The family is often impacted greatly when a member has an eating disorder. Research has been done specifically in regards to the effect on the siblings of people with eating disorders. A qualitative study conducting interviews found that having a sibling with an ED had a profound and negative

effect on family relationships, and was often a source of conflict, especially around mealtime (Callio, Gustafsson, Örebro universitet, & Institutionen för medicinska vetenskaper, 2016). The sibling showed elevated levels of distress and would report constant worry about the health of their sibling with an ED. These effects can be potentially mitigated by an open and supportive climate within the home to stray from worry or anger that may arise.

Genetic Predictors of Eating Disorder Development

The increasing prevalence and impact of eating disorders have lead researchers to investigate what predictors are reliable for eating disorder development. Eating disorder development has been correlated with numerous factors, including genetic and environmental influences. The genetic influences that are thought to contribute to eating disorder development have been discovered through studies conducted on twin siblings. Twins are either monozygotic, meaning they are identical twins or dizygotic meaning they are fraternal twins. Identical twins share the same genetic makeup, making them the ideal subjects for genetic research. Identical twins having the same genes makes it possible to differentiate genetic from environmental effects by comparing similarity for a trait/disorder between identical twins. After using identical twins as subjects to test for genetic predictors, studies have found that behaviors of binge eating, self-induced vomiting, and dietary restraint are roughly 46 to 72 percent heritable (Bulik, Sullivan, Wade & Kendler, 2000). In addition to these behaviors, attitudes regarding body dissatisfaction, eating and weight concerns, and weight preoccupation, show heritabilities of roughly 32 to 72 percent (Wade, Martin & Tiggeman, 1998; Rutherford, McGuffin, Katz & Murray, 1993). These attitudes and behaviors often associated with eating disorders have been shown to have a significant genetic contribution. Additionally, eating disorders themselves have also shown a correlation that suggests genetic effects contribute to eating disorder development.

Estimates indicate that 58 to 76 percent of the variance in the liability to AN (Klump, Miller, Keel, McGue & Iacono, 2001) and 54 to 83 percent of the variance in the liability to BN (Kendler, MacLean, Neale, Kessler, Heath & Eaves, 1991) can be accounted for by genetic factors. Although the confidence intervals on these estimates are wide, consistent findings across studies support moderate heritability of these traits. The remaining variance in liability within AN and BN appears to be due to unique environmental factors between the siblings. This conclusion introduces another influential predictor of eating disorders which are environmental factors.

Environmental Predictors of Eating Disorder Development

Predictors that are classified as environmental pertain to the setting in which an individual is raised or continues to live and often has an emphasis on ones' family. An environmental predictor for eating disorder development is a lack of family cohesion and effective communication skills. A study that administered questionnaires to female patients with eating disorders and a comparison group of females without eating disorders found that the group with the eating disorder consistently ranked their families as being less cohesive and having higher conflict than the comparison group (Johnson and Flach, 1985; Humphrey, 1986). Another environmental predictor that stems from the family unit is the parental attachment relationship children form with their parents. When a study assessed a group of females with EDs and a comparison group without EDs they found that the group with EDs thought that both their parents were significantly lower in care and warmth than the comparison group (Calam & Slade, 1989). The family environment can have a substantial impact on an individual and may interact with other predictors that can lead to psychopathology. Ultimately, psychopathology can be better understood as the interaction of genetic and environmental factors. This area of research is

known as gene x environment interaction and is becoming more heavily studied.

Socio-Cultural Predictors of Eating Disorder Development

Sociocultural influences that are considered risk factors for eating disorder development consist of extensive media exposure, perceived pressures for thinness, thin-ideal internalization and thinness expectancies (Culbert, Racine, Klump, 2015). Media exposure, perceived pressure to be thin, thin-ideal internalization, and thinness expectancies have all been shown to prospectively predict increased levels of disordered eating cognitions and behaviors such as body dissatisfaction, dieting, and bulimic symptoms, in adolescent and young adult females (Bearman, Presnell, Martinez, & Stice, 2006; Combs, Smith, Flory, Simmons, & Hill, 2010). Though these factors have been correlated to eating disorder cognitions and behaviors they are not found to be universal due to the role of Western culture and individual differences.

Individual Predictors of Eating Disorder Development

Individual predictors for psychopathology can be categorized as either psychological or experiential factors. Two well-documented psychological factors associated with EDs are body dissatisfaction and poor self-esteem. Body dissatisfaction is defined as negative perceptions and feelings a person has in regards to their body that is influenced by body shape, attitudes toward weight and perceived appearance (Peat, Peyerl, & Muehlenkamp, 2008; Phillips & de Man, 2010). Body dissatisfaction is extremely pervasive in young women in Western cultures and is increasingly prevalent (Rodin, Silberstein, & Striegel-Moore, 1984), therefore body dissatisfaction is beginning to normalize. Body dissatisfaction and eating disorder development have a significant relationship (Vasilenko, Ram & Lefkowitz, 2010;2011). Body dissatisfaction often leads to restrictive dieting or excessive exercise to try and control one's shape or appearance. These behaviors when increasing in level of severity and frequency, can develop

into disordered eating patterns and eventually progress into an eating disorder (Mayo Clinic, 2019). Therefore, body dissatisfaction acts as a mechanism to promote disordered eating behaviors (Stice, 2002). Specifically, body dissatisfaction is most strongly associated with a bingeing or purging subtype of an eating disorder (Cash & Smolak, 2011). Feelings of shame surrounding an individual's own body coupled with shame around eating may lead to either bingeing or eating any amount of food and feeling regretful then forcing oneself to expel the food intake, which is purging. The other psychological factor that significantly influences eating disorder development is general self-esteem. A recent study found having a low self-esteem score on the Rosenberg scale significantly increased the likelihood of having an elevated score on the EAT-26, a commonly used disordered eating scale (Mora, Rojo, Banzo & Quintero, 2017).

A large body of research suggests that specific life events can influence an individual's likelihood of developing an ED. Specifically, significant relationships exist between childhood sexual abuse, family history and adverse childhood experiences, and later-in-life disordered eating (Caslini, Bartoli, Crocamo, Dakanalis, Clerici & Carrà, 2016; Kong & Bernstein, 2009). Early adverse childhood experiences can be separated into three categories that consist of emotional, physical, and sexual abuse. All types of abuse are significant predictors to eating psychopathology and disordered eating behaviors (Kong & Bernstein, 2009). However, the most commonly studied type of early abuse is childhood sexual abuse. Research on the relationship between childhood sexual abuse and the development of general eating disorders have provided mixed findings with respect to the significance of results (Smolak & Murnen, 2002). The range in results greatly varied in this meta-analysis. A study that measured the development of BN and childhood sexual abuse had a strong correlation of 0.42 (Deep, Lilenfeld, Plotnicov, Pollice &

Kaye, 1999) while a different study that measured nonspecified EDs and childhood sexual abuse had a negative correlation of -0.145 (Palmer, Chaloner & Oppenheimer, 1992). It is important to recognize that when studies examine relationships between childhood sexual abuse and a specified type of eating disorder the results are more significant than when studies measured childhood sexual abuse and nonspecified or general EDs. This was the case in the study which showed a strong correlation between BN and childhood sexual abuse (Deep, Lilienfeld, Plotnicov, Pollice & Kaye, 1999). Whereas the study that measured nonspecific EDs had no significant findings (Palmer, Chaloner & Oppenheimer, 1992). A different meta-analysis of 30 studies surrounding the relationship between childhood sexual abuse and eating disorders revealed a positive and consistent association between childhood sexual abuse and development of bulimia nervosa and binge-eating disorder, but no significant relationship between childhood sexual abuse and anorexia nervosa (Caslini et al., 2016). These findings indicate that the differentiation of eating disorder type is crucial to identifying if childhood sexual abuse will be a risk factor for later development of an eating disorder. Delving even deeper into classification has proven beneficial because there has been significance found in subtypes of the eating disorder categories. Bulimia nervosa has two subtypes: the purging type, and the non-purging type. Studies that consider these subtypes have found that children that experience childhood sexual abuse are more likely to have developed a purging subtype of bulimia nervosa in comparison to any other eating disorder types or subtypes (Sanci, Coffey, Olsson, Reid, Carlin & Patton, 2008). These new discoveries are important as they further investigate the correlation of childhood sexual abuse experiences and the development of disordered eating.

Eating Disorder Mechanisms

Eating disorders can develop from an experience of childhood sexual abuse or other early life trauma and abuse as a function of dissociative coping (Smolak & Murnen, 2002). Coping mechanisms are cognitions and behaviors used to manage the internal and external demands of a stressful or threatening situation (Folkman & Lazarus, 1980). When people encounter negative life events individuals may implement coping mechanisms to bypass those negative events. Dissociative coping mechanisms are a type of coping mechanism where the individual separates themselves from the incident or disconnect by focusing on something else and avoiding the problem (Wagener & Much, 2010). This type of coping does not solve a problem as it typically avoids the initial issue and often creates additional problems, which can be detrimental (DePrince & Freyd, 2002). Dissociation is an adaptive mental and physical response to trauma (Perry, Pollard, Blakely, Baker & Vigilante, 1995) and is often observed after incidents of childhood sexual abuse as well as other adverse childhood experiences (Trickett, Noll & Putnam, 2011). Dissociative coping is frequently witnessed when the child exhibits self-blame and shame towards the incident(s) of sexual abuse (Feiring, Cleland & Simon, 2010). Dissociative coping can take on various forms such as memory loss, anxiety, and depression, but one of the most relevant ways it manifests is as an eating disorder (Mayo Clinic, 2019). The ability to escape upsetting emotions, which can be generated by childhood sexual abuse, and refocus on something controllable like eating behaviors can be a cathartic activity though unhealthy and unsafe (Wagener & Much, 2010). Bulimia nervosa is the most highly correlated eating disorder to dissociative coping. Dissociative coping represents an escape similar to how the binge-purge cycle can be explained as a way to control and escape (McShane & Zirkel, 2008). Women with bulimia nervosa reported experiencing higher levels of dissociative

symptoms during binge-purge episodes and dissociative symptoms returned to normal levels after completion of the purge.

Developmental Theories and Eating Disorders

Though there have been significant findings from eating disorder research studies, there have been an equal amount of research outcomes leading to insignificant and heterogeneous findings within the field (Smolak & Murnen, 2002). Many that investigate the relationship between eating disorders and risk factors are often analyze adverse events and eating disorder development (Caslini et. al, 2016; Kong & Bernstein, 2009). However, there is a paucity of research examining relationships among atypical, rather than adverse, events and eating disorder development. For example, rather than examining the relationship of eating disorders to a negative event or experience, studies can measure the relationship amongst many people to see the differences in eating disorder development between people with and without normal individual development. There are many developmental milestones people are expected to meet within a general period of time. For example, the onset of a woman's menstruation has a normative time window; early menarche has been linked to increased risk of pregnancy and sexually transmitted infections before the age of 18 (Boden, Fergusson & Horwood, 2011) and increased development of depression (Alcalá-Herrera & Marván, 2014). On the other hand, late menarche has been linked with increased risk of cardiovascular disease (Luijken, van der Schouw, Mensink & Onland-Moret, 2017).

Sexual Debut

There is also research that suggests that the age at which an individual's first sexual encounter (sexual debut) occurs has implications for the development of depressive symptoms, delinquency and increased risky behaviors (Armour & Haynie, 2007; Golden, Furman &

Collibee, 2016). Developmental theory is instrumental in explaining how early sexual initiation may correlate with other atypical or destructive behaviors (Armour & Haynie, 2007). Of primary interest here, developmental theory and life course research suggest that timing of sexual debut is consequential for later behavior if behavioral transitions are made earlier or later than transitions made by one's peers. That is, they can have negative consequences for individuals experiencing the transition. Research suggests that an association between sexual debut and disordered eating behaviors may exist. An individual's age at first sexual intercourse, or sexual debut, is thought to occur during one of the three developmental stages (Harden, 2012). The three stages consist of early (15 years or younger), normative (ages 16 -19) and late (20 or older) sexual debut. If an individual has a sexual debut outside of the normative stage, specifically a sexual debut within the early stage, then there could be a correlation between an individual's age at sexual debut and later development of disordered eating behaviors. Sexual activity has a strong relationship to body image and self-esteem, and a negative sexual experience may elicit increased feelings of negative body image, low self-esteem and reduced sexual functioning and satisfaction (Sanchez & Kiefer, 2007). A negative sexual experience can occur in numerous ways including a nonconsensual experience, an unenjoyable experience, or an experience where the individual was not physically or emotionally developmentally ready for that experience. An early sexual debut is often considered negative due to the current stage of development of an individual during an early sexual debut (Armour & Haynie, 2007). Thus, a negative sexual experience such as early sexual debut or nonconsensual sexual debut could be related to body dissatisfaction or low self-esteem. As mentioned earlier, a predictor of eating disorder development is body dissatisfaction and poor self-esteem.

Methodology

Study Design

This was a single-session online study that was designed for men and women eighteen years or older who could read and write in the English language. Participants completed a survey consisting of questionnaires assessing sexual experiences and disordered eating behaviors. Additional questionnaires explored body dissatisfaction, self-esteem, and sexual and physical abuse history. One predictor variable was the *age at sexual debut* (i.e. first sexual intercourse experience). The age at sexual debut was separated into three stages: early (15 years or younger), normative (ages 16 -19) and late (20 or older) sexual debut (Harden, 2012). The outcome variable was *disordered eating attitudes* as measured by the short version of the Eating Attitudes Test, the EAT-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982). The other predictor variable being assessed was *consent at sexual debut*, whether the experience was consensual or nonconsensual. The outcome variable in this analysis was also *disordered eating attitudes* measured by the EAT-26 (Garner, Olmsted, Bohr, & Garfinkel, 1982).

I hypothesized that there would be an inverse predictive relationship between age at sexual debut and eating behaviors, such that those with an earlier stage of sexual debut would report higher scores on the eating attitudes test (EAT-26). I also hypothesized a predictive relationship would exist between nonconsensual sexual experience at sexual debut and disordered eating attitudes. Lastly, I theorized body dissatisfaction, low body esteem, and low self-esteem would mediate the relationship between early sexual debut and disordered eating attitudes as well as the relationship between nonconsensual sexual debut and disordered eating attitudes.

Participants

Participants in this study were males and females above the age of eighteen who could read and write in the English language. An original sample size of 638 participants began the online study session. After removing participants who had incomplete surveys and male participants, the final sample size was $N=448$. I recruited participants for this study through posting on multiple websites and social media platforms including the Meston Lab website, UT Know Events, Craigslist, Facebook and Reddit. Interested participants were directed to the online consent form where they were able to begin the study. Participation took roughly 30 minutes to complete, and participants who completed the entire study were entered into a drawing for the chance to win a \$50.00 USD Visa e-gift-card.

Protection of Human Participants

This study included the use of human participants, therefore measures were taken to protect the privacy and well-being of participants. Subjects were not exposed to any direct risk that exceeded the risks they might encounter on a daily basis. However, there was the potential for some of the questions to elicit memories of traumatic sexual experiences. In order to mitigate these risks, the consent form fully detailed the expectations of participants to complete measures of both consensual and nonconsensual sexual experiences before beginning the survey. Additionally, the consent form detailed the participants right to withdraw from the study at any point and/or decline to answer questions that they do not want to respond to. Data was collected online, therefore a slight risk of breach of confidentiality exists due to limitations of technology. For this reason, no identifying information was requested from participants at any point during the data collection. Anonymous identification numbers were assigned to all response sets. Therefore, the study was entirely voluntary, confidential, and anonymous which also helped to

reduce some of the risk. In order to facilitate the anonymous data collection, the Qualtrics Anonymized Response feature was used to ensure IP addresses and locations were not collected. The data remains completely anonymous and de-identified at all times

Measures

Demographics Questionnaire collected information on age, gender-identity, sexual orientation, ethnicity, pubertal timing, parent's marital status, age of first consensual sex and age of first nonconsensual sex if applicable and current relationship status.

The Sexual and Physical Abuse History Questionnaire (SPAQ; Kooiman, Ouwehand & Kuile, 2002). The SPAQ is used by adult respondents, older than 18 years of age, to assess instances of sexual and physical abuse during childhood and later life. The questionnaire asks about sexual and physical abuse experiences and if they occurred at what age they happened. This survey does not generate a score, as it is more of a qualitative assessment. The survey presents questions such as have you had this sexual or physical experience, if so at what age, have you discussed the experience with others and can you further elaborate?

The Eating Attitudes Test Short Version (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982). The EAT-26 is a 26-item self-report questionnaire designed to identify patients with serious eating concerns. The EAT-26 has three factors (dieting, bulimia and food preoccupation, and oral control) and was derived from the Eating Attitudes Test (Garner & Garfinkel, 1979). Both the original version of the EAT and the revised shortened version, EAT-26, have been found to be psychometrically sound scales for eating disorders. The shortened version has been validated by research, finding that the scale has a Cronbach's alpha of 0.85. Each item is a behavior (eat diet foods) or attitude (feel that food controls my life) typical of individuals that have either anorexia nervosa or bulimia nervosa and is rated on a Likert scale.

The selections for answering the behavioral or attitude questions consist of always (3), usually (2), often (1), sometimes (0), rarely (0) and never (0). The first 25 questions are scored this way while the last question, question 26, is reversed in valence. To score the questionnaire the answers are assigned a value and added. A score of 20 or above is indicative of problematic eating behaviors or attitudes. Alongside this scale, the EAT-26 includes two other surveys which are not used within the generation of the overall score. One section has questions regarding height and weight for the ability to calculate the participant's Body Mass Index (BMI). The other survey measures behavioral patterns of eating and weight loss. This survey includes questions such as, "How often do you go on binges where you cannot stop, or how often do you make yourself vomit or use laxatives to control your weight?"

The Body Shape Questionnaire Short Version (BSQ-8C; Welch, Lagerstrom & Ghaderi, 2012). The BSQ-8C is an 8-item self-report questionnaire designed to classify an individual's concern with their body shape and image. This test was derived from the Body Shape Questionnaire (Cooper, Taylor, Cooper & Fairburn, 1987) which has been found to be a psychometrically sound scale for body shape and image of people that exhibit disordered eating behaviors. The short version used in this study, BSQ-8C, has also been validated as a satisfactory instrument to measure body shape dissatisfaction. The BSQ-8C measured a Cronbach's alpha of 0.92 for internal consistency and also had a high test-retest reliability of 0.95 (Welch, Lagerström & Ghaderi, 2012). Each item is a behavior or attitude that is answered on a Likert scale of frequency from 1 (Never) to 6 (Always). The scores can range from 8-48, with higher scores representing higher concern with body shape. There are four distinct categories that can be assigned based on score consisting of no concern with shape (less than 19), mild concern with shape (19-25), moderate concern with shape (26- 33) and marked concern with shape (over 33).

The Body Esteem Scale - Revised (BES-R; Frost, Franzoi, Oswald & Shields, 2018).

The BES-R is a 28 item, five-point Likert self-report questionnaire asking individuals to assign feelings to body parts and functions ranging from strong negative feelings (1) to strong positive feelings (5). The BES-R is used to assess an individual's self-evaluations of their own bodies.

The scale was revised from the Body Esteem Questionnaire (Franzoi & Shields, 1984) in order to increase internal consistency as well as convergent and discriminant validity. The revised scale conceives body esteem as both gender-specific and multidimensional. There are three existing subscales within this questionnaire for each gender. The subscales for women are sexual attractiveness, weight concern, and physical condition while the subscales for men are physical attractiveness, upper body strength, and physical condition. Each subscale has an individual Cronbach's alpha generated. The Cronbach alphas for the subscales for women are as follows, 0.72 (sexual attractiveness), 0.89 (weight concern), and 0.81 (physical condition). The Cronbach alphas for male subscales are 0.80 (physical attractiveness), 0.88 (upper body strength), and 0.90 (physical condition). All subscales fall above an acceptable threshold for internal consistency and reliability.

The Rosenberg Self-Esteem Scale (Rosenberg, 1965). The Rosenberg Self-Esteem Scale is a 10 item scale that measures global self-worth through positive and negative feelings about the self. All items are answered by using a four-point Likert scale ranging from strongly agreeing to strongly disagreeing. The scores can range from 0-30, with higher scores indicating low self-esteem and self-worth and lower scores indicating high self-esteem and self-worth. The scale generally has high reliability with test-retest correlations in the range of 0.82 to 0.88, and Cronbach's alpha range from 0.77 to 0.88 (Blascovich & Tomaka, 1991; Rosenberg, 1986).

Data Collection Procedure

This study was advertised through online postings on multiple websites and social media platforms. These platforms included the Meston Lab website, UT Know Events, Craigslist, Facebook, and Reddit. Participants clicked on a hyperlink in the posting which took them directly from whichever web platform they were using to the informed consent page on Qualtrics. The survey was created on Qualtrics (an online customizable survey software) through the University of Texas at Austin secure researcher account. In order to participate participants had to consent to participation and were then directed to the survey questionnaires described above. The order of the questionnaires was as follows: the first questionnaire measured demographic information and sexual debut, followed by the Sexual and Physical Abuse History Questionnaire, Eating Attitudes Test Short Version, Body Shape Questionnaire Short Version, Body Esteem Scale-Revised, and Rosenberg Self-Esteem Scale. The scales, in the beginning, dealt specifically with sexual experiences including age at sexual initiation, and any adverse sexual experiences. Then the questionnaires moved towards eating attitudes and concluded with assessing body perception and esteem. After completing the questionnaires, participants were given a code to email to the research study's email account (sebresearch@gmail.com) in order to be entered into the drawing for a \$50.00 USD Visa e-gift-card. Upon completion of recruitment, one of the email addresses was pulled in a randomized drawing and that participant was sent the e-gift-card to that email address.

Statistical Analyses

All statistical analyses were completed using R software (R Core Team, 2013). Linear regressions were conducted using the nlme package for linear and nonlinear mixed effects (Pinheiro, Bates, DebRoy, Sarkar & R Core Team, 2019). The general relationship between sexual debut and disordered eating behaviors and attitudes was analyzed through a linear regression using the Eating Attitudes Test (EAT-26) total scores as the outcome variable and characteristics of sexual debut as a predictor variable. The two possible predictors associated with sexual debut are age at sexual debut and consent at sexual debut. Age was assessed as a categorical variable with three separate categories. The three categories are early sexual debut ages 15 and under, normative sexual debut which are ages 16-19, and late sexual debut which are ages 20 and older. The other characteristic regarding consent at sexual debut was assessed as a linear variable, an individual's sexual debut is either consensual or nonconsensual.

The first analysis investigated the relationship between eating behaviors and attitudes and age at sexual debut as mediated by self-esteem, body satisfaction, and body esteem. To begin analyzing this relationship multiple regressions were run in order to determine the existence of the a-path within the mediation model. The first regression tested for a significant relationship between age at sexual debut and self-esteem. This regression was performed by using the category of age at sexual debut and the total self-esteem score generated by the Rosenberg Self-Esteem Scale. The next regression investigated age at sexual debut and body satisfaction using the BSQ-8C. Lastly, the variable of body esteem was evaluated by running three separate regressions for the three female subscales of body esteem on the BES-R. Regressions between age at sexual debut and weight concern, physical condition, and sexual attractiveness were all run. Once an a-path has been determined in the mediation model the next relationship

investigated was the c-path. The c-path is the direct relationship between the age of sexual debut and eating attitudes and behaviors. This relationship was run as a linear regression using the age at sexual debut and the total overall EAT-26 score. Once a significant c-path relationship had been established a mediation model could be implemented, including the variables that found significant a-path relationships. The mediation models were run through use of a mediation package in R (Tingley, Yamamoto, Hirose, Keele & Imai, 2014). There was the potential to run five mediation models if all a-path regressions had found significant results.

The second analysis was investigating the relationship between eating attitudes and consent at sexual debut as mediated by self-esteem, body satisfaction, and body esteem. Similar to the previous analysis, the relationship between the predictor variable, consent at sexual debut, and the potential mediating variables of self-esteem, body satisfaction, and body esteem were examined for significance. These relationships were run using multiple regressions to determine an a-path within the mediation model. The first regression tested for a significant relationship between consent at sexual debut and self-esteem. This linear regression was performed by using the variable of nonconsensual or consensual sex at sexual debut and the total self-esteem score generated by the Rosenberg Self-Esteem Scale. The next regression investigated consent at sexual debut and body satisfaction using the BSQ-8c. The last variable of body esteem was evaluated by running three separate regressions for the three female subscales of body esteem. Regressions between age at sexual debut and weight concern, physical condition, and sexual attractiveness were all run. Once an a-path has been determined in the mediation model the next relationship investigated was the c-path. The c-path is the direct relationship between the consent of sexual debut and eating attitudes and behaviors. This relationship was run as a linear regression using the consent at sexual debut and the total overall EAT-26 score. Once a

significant c-path relationship had been established a mediation model could be run including variables that found significant a-path relationships. Again, there was the potential to run five mediation models if all a-path regressions had found significant results.

Results

Age at Sexual Debut and Eating Attitudes

Analyses were first run to evaluate the relationship between the independent variable of age at sexual debut on the dependent variable of eating attitudes. To determine whether mediation modeling was appropriate for this relationship and its potential mediators, simple linear regressions to establish a-path relationships between age at sexual debut and potential mediators were conducted. Five linear regressions were run to address potential a-paths within a mediation model. The first regression was run including *age at sexual debut* and *self-esteem*. Results showed there was no significant relationship between age at sexual debut and self-esteem, ($F(1, 377) = 1.84, p = 0.175, R^2 = 0.005$). Next, *age at sexual debut* and *body satisfaction* were run as a linear regression, which also did not yield a significant relationship, ($F(1, 377) = 1.898, p = 0.169, R^2 = 0.005$). Three separate regressions were conducted for each subscale of the BES. The linear regression between *age at sexual debut* and *weight concern* did not result in a significant relationship ($F(1, 377) = 2.385, p = 0.123, R^2 = 0.006$), the regression between *age at sexual debut* and *physical condition* did not result in a significant relationship ($F(1, 377) = 1.508, p = 0.22, R^2 = 0.004$), and the regression between *age at sexual debut* and *sexual attractiveness* also did not show a significant relationship ($F(1, 377) = 0.332, p = 0.564, R^2 = 0.001$).

The relationship between *age at sexual debut* and *eating attitudes* was still investigated to see if a c-path relationship existed. A linear regression was run between *age at sexual debut* and EAT-26 and found the relationship was not significant ($F(1, 377) = 4.234, p = 0.259, R^2 = 0.007$). As neither the a-paths nor c-path was significant, mediation was not assessed. The lack of

significant results examining *age at sexual debut* lead to focusing primarily on the relationship between consent at sexual debut and disordered eating behaviors and attitudes.

Consent at Sexual Debut and Eating Attitudes

Analyses were run to evaluate the relationship between the independent variable of *consent at sexual debut* on the dependent variable of *eating attitudes*. Simple linear regressions to establish a-path relationships between age at sexual debut and potential mediators were first run. There were five linear regressions run to address potential a-paths within a mediation model. The first regression run was between *consent at sexual debut* and *self-esteem* and the results showed a significant relationship ($F(1, 448) = 4.36, p < 0.04, R^2 = 0.009$). The next regression run was between *consent at sexual debut* and *body satisfaction*, where results also found a significant relationship ($F(1, 448) = 13.73, p < 0.001, R^2 = 0.029$). The last possible mediator variable investigated was the body esteem variable which includes the three separate subscales of weight concern, physical condition, and sexual attractiveness. There were three separate regressions run between *consent at sexual debut* and *weight concern* ($F(1, 448) < 0.001, p = 1, R^2 < 0.001$), *physical condition* ($F(1, 448) = 0.861, p = 0.353, R^2 = 0.001$), and *sexual attractiveness* ($F(1, 448) = 0.898, p = 0.343, R^2 = 0.002$), none of which resulted in significant relationships. The two significant a-path relationships found between consent at sexual debut and self-esteem, and consent at sexual debut and body satisfaction lead to further examination of the relationship between consent at sexual debut and eating attitudes.

The c-path was run as a linear regression which found a significant relationship between *consent at sexual debut* and *eating attitudes* ($F(1, 448) = 13.53, p < 0.001, R^2 = 0.021$). The two significant a-paths alongside a significant c-path made it possible to run two mediation models. The first mediation model run was using the three variables of consent at sexual debut, eating

attitudes, and self-esteem. The mediation model (figure 1) shows a significant relationship between the three variables thus suggesting that self-esteem acts as a mediating variable of the relationship between consent at sexual debut and eating attitudes. Self-esteem is a partial mediator, accounting for 88% of the relationship. The second mediation model (figure 2) includes the consent at sexual debut, eating attitudes, and body satisfaction variables. This mediation model found a significant relationship, confirming a partial mediation. The model confirms that body satisfaction explains 28% of the relationship between consent at sexual debut and eating attitudes.

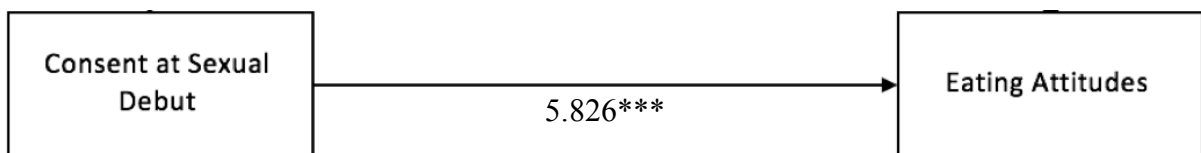


Figure 1. Regression coefficient for the relationship between consent at sexual debut and eating attitudes.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

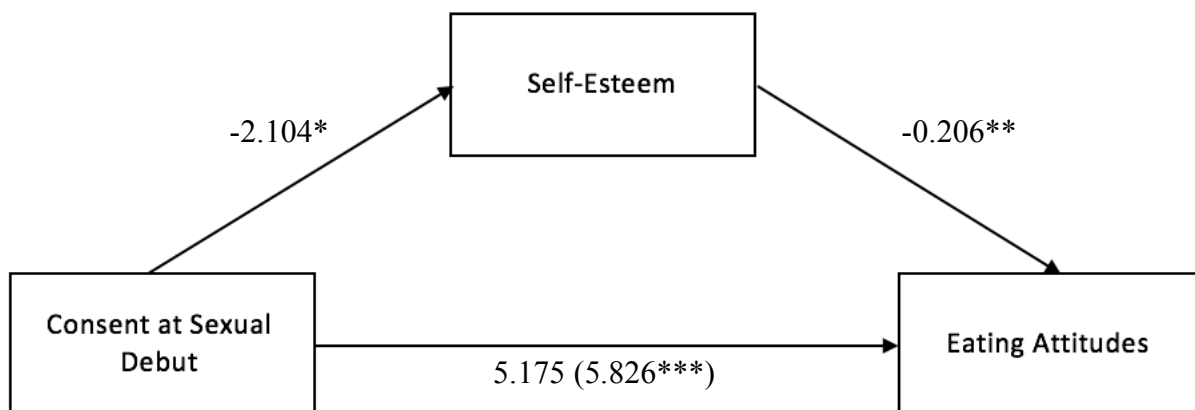


Figure 2. Regression coefficients for the relationship between consent at sexual debut and eating attitudes as mediated by self-esteem.



* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 3. Regression coefficients for the relationship between consent at sexual debut and eating attitudes as mediated by body satisfaction.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Discussion

This study investigated the potential relationships between sexual debut (ie. age of sexual debut, and nonconsensual or consensual sexual debut) and eating attitudes and behaviors. In addition to the existence of these relationships, the study aimed to identify possible mediators. Historically, age of sexual debut has been associated with adverse outcomes such as the development of depressive symptoms, delinquency, increased risky behaviors, and greater substance abuse (Armour & Haynie, 2007; Golden, Furman & Collibee, 2016). In addition to such outcomes, research has found that an earlier age of sexual debut may effect an individual's self-schemas. For example, a sexual debut of 15 years or younger has been found to be predictive of greater internalizing symptoms, less body satisfaction, and lower global self-worth (Golden, Furman & Collibee, 2016). Body dissatisfaction (Stice, 2002), low self-esteem or self-worth (Mora, Rojo, Banzo & Quintero, 2017), and nonconsensual sexual experiences (Smolak & Murnen, 2002) are all variables that have been independently correlated with disordered eating attitudes.

These findings lead me to believe that a relationship between an early age at sexual debut and disordered eating attitudes may also be present as explained by body dissatisfaction or low self-esteem. However, no relationship emerged between the age of sexual debut and eating attitudes. In addition, this study did not find significant relationships between age at sexual debut and any potential mediators of body esteem, body satisfaction, or self-esteem as other studies have found. The other relationship hypothesized was that between nonconsensual sexual debut and disordered eating attitudes. The previous research findings of nonconsensual sexual experiences being related to disordered eating raised reason to suspect a significant relationship may exist. Results showed a strong correlation between nonconsensual sexual debut and

disordered eating attitudes. Further analysis found that both body satisfaction and self-esteem were mediators of this relationship.

The lack of significance between age of sexual debut and eating attitudes may be explained by numerous factors. First, there was a paucity of participants reporting an early sexual debut, which, in this study was defined as having one's first sexual experience at or below 15 years of age. The small sample size for this group could have contributed to the insignificance in the relationship between age at sexual debut and eating attitudes. Alternatively, it is possible that one's age at sexual debut may not be as influential on eating attitudes as originally thought (Kastbom, Sydsjö, Bladh, Priebe, Svedin, Avdelningen för neuro-och inflammationsvetenskap, et. al, 2015). The age at which an individual has sexual intercourse for the first time does not predict the type of sexual encounter that person will experience. In other words, an individual experiencing sexual debut before fifteen does not determine whether or not the experience was positive or negative. Ultimately, the perception of the sexual experience may be more predictive than the age at sexual debut. Existing research has linked childhood sexual abuse (CSA) to an extensive list of adverse outcomes including, depression, substance abuse, post-traumatic stress disorder, and disordered eating (Trickett, Noll & Putnam, 2011; Feiring, Cleland & Simon, 2010; Smolak & Murnen, 2002). However, the relationship between CSA and eating disorders may be significant not solely due to the experience being at a young age, but the experience being nonconsensual. The emotional aspects of the experience may specifically contribute to self-schemas such as self-esteem and body satisfaction. The variable of consent at sexual debut was found to be significant in establishing a relationship with eating attitudes.

This significant relationship between consent at sexual debut and eating attitudes could be explained by adverse sexual debut rather than atypical sexual debut being predictive of mental

health outcomes. As discussed above the overall affect towards the experience of sexual debut seems to play a larger role than having a sexual debut that is at a non-normative time. This is also shown through the development of negative self-schemas that were correlated with a nonconsensual sexual debut. This study found body dissatisfaction and low self-esteem to be associated with a nonconsensual sexual debut. These variables of body dissatisfaction and low self-esteem have been linked to the development of disordered eating in previous research (Stice, 2002; Mora, Rojo, Banzo & Quintero, 2017). The findings in this study were consistent with these previous findings, as there was an existing relationship between body dissatisfaction and disordered eating, and low self-esteem and disordered eating. This adds additional evidence that both body dissatisfaction and low self-esteem may act as mechanisms in the development of disordered eating. Furthermore, in this study mediation analyses were conducted to find that body satisfaction explained the relationship between nonconsensual sexual debut and disordered eating attitudes. Body dissatisfaction explains 28% of this relationship thus body dissatisfaction is a mechanism in which nonconsensual sexual debut leads to disordered eating attitudes. An additional mediation analysis was run, finding that self-esteem also explained the relationship between nonconsensual sexual debut and disordered eating attitudes. Low self-esteem explains 88% of this relationship therefore low self-esteem is another mechanism that demonstrates how nonconsensual sexual debut leads to disordered eating attitudes. These models illustrate potential developmental pathways to disordered eating.

There are limitations to consider in the current study. One limitation of the present study is the lack of inclusion of male participants. Though this study originally included males, a paucity reported a history of nonconsensual sexual experiences - a primary variable in this study – and it was not possible to run models on this population. They were thus excluded. Given the

relationship between nonconsensual sex and eating that emerged in women, future research should specifically recruit males to determine the extent of this relationship in this population. Another limitation of this study was the large proportion of college student participants, which is not representative of the entire community. Though recruitment took place at venues outside the university, a large portion of participants were college students. Future studies could examine populations not connected to a university. Lastly, the use of a clinically diagnosed eating disorder, rather than the EAT-26 score for the outcome variable of disordered eating may yield even stronger results. Future studies could include individuals with clinically diagnosed eating disorders to assess the relationship further.

Conclusion

The results of this study revealed three important relationships upon which to focus our attention. The relationship between a consensual or nonconsensual sexual debut and eating attitudes is the primary significant finding. A nonconsensual sexual experience is predictive of more disordered eating attitudes. This relationship made it possible to establish variables that contributed to the significance between the consent at debut and eating attitudes. The variable of self-esteem was found to partially explain the relationship between consent at debut and eating attitudes. The variable of body satisfaction also was able to explain the relationship of consent at debut and eating attitudes. This indicates that difficulty with body satisfaction and self-esteem are two mechanisms that contribute to increased disordered eating attitudes in women that experience nonconsensual sexual debuts.

Implications of these findings may encourage the implementation of preventative measures against the development of body dissatisfaction or low self-esteem for women with nonconsensual sexual debuts. These measures would aim to prevent the development of these negative self-schemas in order to prevent later development of disordered eating. The identification of the mediating variables of body dissatisfaction and low self-esteem may also be beneficial in a treatment setting for individuals that have already developed disordered eating. Recognizing body dissatisfaction and low self-esteem as mediators of this relationship may allow for the specialization of eating disorder treatment options for women that are suffering from eating disorders.

Another beneficial use of these findings could be to help the population of women that have experienced sexual trauma and have developed eating disorders. Studies have found that women that have experienced sexual trauma, such as nonconsensual sexual debut, do not

respond well to the standard eating disorder treatments (De Felice, Dall'Agnola, Bonetto, Bonora, Cristofalo, Dal Corso, et. al, 2018). The ineffectiveness of these treatments for this population may be due to a lack of insight to which the disordered eating developed. Future treatments may decide to focus on addressing issues associated with sexual trauma alongside the eating disorder to achieve better treatment outcomes for these patients, given that a strong relationship exists between nonconsensual sexual debut and disordered eating. Treatments for these women may also want to focus on targeting the mediating variables of body dissatisfaction and low self-esteem as they explain the relationship between nonconsensual sexual debut and disordered eating.

Additionally, these findings can help contribute to the growing literature on disordered eating and the course of eating disorder development. Further research does need to be conducted in the field of eating disorder research and on this specific relationship between nonconsensual sexual debut and eating attitudes, however, this study does yield promising findings.

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