



Delay discounting, but not disinhibition or inattention, partially mediates the effects of neuroticism on disordered eating in adolescents



Sneha Thamocharan, Meagan Hubbard, Sherece Fields *

Health Behavior Research Group, Department of Psychology, Texas A&M University, USA

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ABSTRACT

Adolescence represents an integral developmental period for the prevention and intervention of disordered eating. Individuals with high levels of neuroticism have been shown to respond with greater impulsivity and use of disordered eating as a coping mechanism. However, the exact mechanism through which neuroticism and impulsivity affect disordered eating remains unknown. To understand the effects of personality and impulsivity on disordered eating in adolescence, the present study aimed to investigate whether impulsivity mediated the relationship between neuroticism and disordered eating. Adolescents ($N = 40$) between the ages of 13 and 19 ($M_{\text{age}} = 18.25$ years; $S.D. = 1.30$) were queried on eating attitudes and personality, as well as completed behavioral tasks assessing impulsivity (delay discounting, disinhibition and inattention). Mediation analyses revealed that neuroticism was significantly associated with patterns of disordered eating, but delay discounting, and not disinhibition and inattention, appeared to mediate the relationship between neuroticism and disordered eating. These results should guide prospective research exploring the relations between neurotic and impulsive behavior, particularly delay discounting on disordered eating, which will assist in future treatment efforts targeting the development of maladaptive eating behaviors.

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1. Introduction

Adolescence represents a critical time in the manifestation and maintenance of disordered eating. Disordered eating during adolescence is high and those adolescents who engaged in disordered eating are at increased risk for these behaviors ten years later (Neumark-Sztainer, Wall, Larson, Eisenberg, & Loth, 2011). Disordered eating can be conceptualized as dieting, unhealthy weight control practices and binge eating (Neumark-Sztainer et al., 2011). This often includes the negative monitoring and maintenance of weight, shape, and eating. Unfortunately, disordered eating is associated with a number of problematic outcomes including obesity and eating disorders, especially in youth (Gearhardt, Boswell, & White, 2014; Neumark-Sztainer et al., 2006; Peebles et al., 2012). This can lead to risk for health complications involving the cardiovascular, skeletal, endocrine, reproductive, and gastrointestinal systems (Torstveit & Sundgot-Borgen, 2014). In addition to being physically harmful, disordered eating can also have a detrimental psychological impact (Butcher, Mineka, & Hooley, 2013). Those engaging in disordered eating can experience elevated levels of suicidal ideation, depression, mood and anxiety disorders, substance abuse, and

withdrawal from interpersonal relationships (NIMH, 2011; Torstveit & Sundgot-Borgen, 2014).

Thus, recent research efforts have focused on determining the risk factors associated with disordered eating broadly, to identify those at risk for eating disorders or obesity. Multiple etiologies focusing on biological, socio-cultural, and behavioral factors have been proposed with hopes of enhancing prevention, education, and treatment programs. As a result, it has been proposed that certain personality-behavioral traits play a significant role in the pathogenesis and development of disordered eating, which renders certain adolescents more vulnerable to disordered eating-conducive environments than others.

A large majority of research has focused on personality characteristics. Specifically, neuroticism, which is marked by high levels of anxiety, moodiness, worry, and perfectionism, is one of the most consistent associated risk factors in research studying disordered eating (Butcher et al., 2013). Individuals with eating disorders (EDs) have been found to have higher levels of neuroticism than the general population, as well as those engaging in behaviors on the ED spectrum (Cassin & Von Ranson, 2005; Davis & Fischer, 2013; Izydorczyk, 2012; Maclaren & Best, 2009). Interestingly, emotional eating, a facet of disordered eating, was also found to be related to neuroticism (Izydorczyk, 2012). Further, individuals who scored lower on the neuroticism scale were predicted to have less disordered eating behaviors and attitudes than those with higher levels of neuroticism (Ferguson, Muñoz, Winegard, & Winegard, 2012). Neuroticism has also been shown to increase the likelihood of

* Corresponding author at: Health Behavior Research Group, Department of Psychology, MS4235, Texas A&M University, College Station, TX 77843, USA. Tel.: +1 979 845 6053; fax: +1 979 845 4727.

E-mail address: safields@tamu.edu (S. Fields).

developing disordered eating patterns (Juarascio, Perone, & Timko, 2011). Meaning that higher levels of neuroticism forecasted higher levels of disordered eating, at a proportional rate (Brannan & Petrie, 2008).

However, previous results linking neuroticism to disordered eating are not consistent. Brown (2007) found that neuroticism did not appear to be significant personality characteristic in prediction of internalization of the thin-ideal or body dissatisfaction, and therefore eating disorder development. Further links between neuroticism and disordered eating are currently absent from the literature. Thus, understanding the underlying behavioral mechanisms influencing disordered eating choices have recently become of interest. At the forefront of this discussion has emerged the contribution of impulsivity to disordered eating. Impulsivity, behavior characterized by little forethought, unplanned reactions without considering future consequences, and disregard for choices in favor of long-term success (International Society for Research on Impulsivity, 2012), is considered a dimensional construct. These constructs are thought to include the following: failure to maintain attention for a period of time (inattention), disinhibition of responses, and inability to see the long-term consequences and failure to make decisions in favor of long-term goals (delay discounting or decision making; Reynolds, Penfold, & Patak, 2008).

Within the spectrum of eating disorders, impulsivity has been extensively studied (Claes, Nederkoom, Vandereycken, Guerrieri, & Vertommen, 2006; Claes, Vandereycken, & Vertommen, 2005; Fischer, Smith, & Cyders, 2008). Generally, those women with greater body dissatisfaction were found to be more impulsive, such as those that fall on either extreme of the eating disorder spectrum (Scherr, Ferraro, & Weatherly, 2010). Further, particular ED subtypes were determined by rates of impulsivity, with bingeing/vomiting types showing the highest correlations of urgency and sensation seeking behaviors (Claes et al., 2005). Moreover, Fields, Sabet, Peal, and Reynolds (2011) found that impulsivity contributes to onset and maintaining of behaviors leading to obesity as well as being more prevalent in obese adolescents when compared to healthy-weight counterparts.

It has been suggested that disordered eating is used as a means to cope with neurotic and impulsive urges. Individuals with high levels of neuroticism, or negative affect state, were more likely to act irrationally, or make rash decisions, thereby making these individuals more vulnerable to disordered eating (Davis & Fischer, 2013). Bulimic women were found to have higher rates of distress as a result of their neurotic personality trait and in response, greater levels of impulsivity, than women who were not diagnosed with an eating disorder (Fischer, Smith, Annus, & Hendricks, 2007). It was also determined that binge eating, a common type of disordered eating, was found to help bulimic women cope with both their neurotic tendencies and impulsive urges, suggesting that disordered eating may serve as a coping mechanism and a result of both neurotic and impulsive tendencies (Fischer et al., 2007). Therefore, because individuals with high levels of neuroticism, or negative affective states, have been shown to act irrationally or make rash decision, recent research has begun to explore the interplay between neuroticism and impulsivity on disordered eating and development of EDs (Davis & Fischer, 2013).

Previous research examining the association between neuroticism and disordered eating are mixed. Further research examining neuroticism, impulsivity and disordered eating is scarce and no study to date has examined impulsivity as a mediator between neuroticism and disordered eating. Moreover, previous research has almost exclusively focused on adult populations and not adolescents; even though this developmental period is most vulnerable to the onset of disordered eating. An examination of neuroticism and impulsivity in the manifestation and maintenance of disordered eating is needed. Neuroticism renders individuals susceptible to more stress, which may result in greater impulsivity and willingness to engage in unhealthy coping mechanisms, such as disordered eating. Understanding how impulsivity, as a behavioral construct, may mediate the relationship between neuroticism

and disordered eating can provide a better understanding of the underlying mechanism through which these factors relate to one another.

The objective for the present study is to determine if delay discounting, a dimension of impulsivity, mediates the relationship between neuroticism and engagement in disordered eating. Based on previous research, we hypothesize that impulsivity – delay discounting, disinhibition, and inattention – will mediate the relationship between neuroticism and all subscales of disordered eating, but only partially. This information may increase our knowledge of the underlying mechanisms contributing to the onset of disordered eating and therefore eating disorders, in adolescents and emerging adults in hopes to assist future education-, prevention-, and treatment efforts.

2. Methods

2.1. Participants

Participants consisted of adolescents ($n = 40$) recruited from the community and undergraduate psychology courses. More than half of the participants were female ($n = 25$; 62.5%) and the average age of all participants was 18.25 years ($S.D. = 1.30$, range = 13–19). The vast majority of participants reported Euro-American ethnicity ($n = 30$; 75.0%), while others reported Asian ($n = 1$; 2.5%), Hispanic ($n = 8$; 20.0%), and Other ($n = 1$, 2.5%) ethnicity. All participants included in the present analyses received either (1) monetary compensation between \$25–35, with specific amount earned dependent on task performance ($n = 6$) or (2) course credit for their participation ($n = 34$; see Table 1).

Potential participants were excluded if they were not between the ages of 13–19 or were taking ADHD medication. These exclusion criteria are necessary because the present papers is focused on adolescents and medications used in the treatment of ADHD have been shown to reduce impulsive behavior as measured by the behavioral assessments included in the study (Tannock, Schachar, Carr, Chajczyk, & Logan, 1989). The present includes individuals up to age 19 years to remain within the age range stipulated by the Council on Child and Adolescent Health (1988) who issued a statement defining the age limits of pediatrics to include commitments prior to birth until the developmental process is completed, thereby delegating responsibility of pediatrics to continue to age 21.

2.2. Measures

2.2.1. Neuroticism

The Eysenck Personality Questionnaire – Short Form (EPQR-S; Eysenck & Eysenck, 1992) is a widely used 48-item self-report questionnaire used to measure personality characteristics. For the purpose of the present study, only questions pertaining to neuroticism were scored. One point was given for every “yes” answer and higher scores reflect greater levels of neurotic behavior.

Table 1
Demographics.

	Total	Mean (S.D.)	Range
Age		18.25 (1.30)	13–19
Males	15		
Females	25		
Asian	1		
Euro-American	30		
Hispanic	8		
Other	1		
Body mass index (BMI)		24.15 (5.14)	17.00–41.26
Quick Intelligence Score (KBIT-2) ^a		106 (12)	75–129

^a $M = 100$, $S.D. = 15$.

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