Impulsivity in Bulimia Nervosa

Bilal Mounir Ghandour (✉ bghandour@elon.edu)  
Elon University  https://orcid.org/0000-0001-5728-2414

Lindsey Bischel  
Elon University

Bridgette Harrell  
Elon University

Grace Bailey  
Elon University

Alexandra Grillo  
Elon University

Cali Beeson  
Elon University

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Abstract

Background:

Despite increasing evidence impulsive traits play a role in bulimia nervosa, the latest version of the Diagnostic and Statistical Manual of Mental Disorders does not include impulsivity as part of the criteria for this eating disorder.

Method:

Using Q sort, a methodology specifically well suited to the expression of individual viewpoints, twenty-six undergraduate women split into two categories - women with bulimia nervosa; women without bulimia nervosa - ranked a total of forty-four statements that were reflective of impulsivity. These statements were derived from a multitude of sources to ensure proper representativeness: academic literature, the popular press, various audio-visual media outlets, focus groups and social media sites.

Results:

A factor analysis was performed that generated two distinct factors that essentially split participants along the lines of a presence or absence of bulimia nervosa. Factor A, called Thinking Through, was characterized by a methodical and carefully processed approach around decision-making, thinking through consequences of actions, and a general tendency towards planning and organization. With the exception of one participant, this factor was represented by participants with no history of bulimia nervosa thus indicating individuals with this eating disorder did not endorse this factor. Factor B, called Negative Urgency and Obsessive Thinking, was characterized by an urge for pleasure-seeking, quick action, a lack of self-control and difficulty postponing reward. Endorsers of this factor often regret decisions made rashly yet tend to repeat actions that feel urgent, despite negative consequences. This factor, with the exception of one participant, consisted of individuals with a history of bulimia nervosa.

Conclusion:

Such finding provides additional evidence for a pattern of impulsivity in women with bulimia nervosa that is not found in their healthy counterparts. In addition, it provides clinicians treating this disorder a guidepost for a more targeted treatment of bulimia and further enhances the need for impulsivity to be included as one of its diagnostic criteria.

Plain English Summary

There is growing evidence that impulsivity is a central component of bulimia nervosa. We conducted a study to show how such traits are present in women with this disorder while they are typically absent in women who don't have bulimia nervosa. Expressing their opinions on how impulsivity plays a role in their lives, women with and without a history of bulimia nervosa ranked statements to express their individual viewpoints on this topic. Our results confirmed the absence of impulsive traits with women who do not
have bulimia nervosa and its significant presence with women who have this eating disorder. In specific, we found that certain aspects of impulsivity such as pleasure seeking and the difficulty to delay gratification are the most prominent aspects of this trait. These results give clinicians more evidence they need to be aware of such specific aspects of impulsivity in the women they treat. Just as importantly, it better helps women with this condition understand the nature of at least some of their bulimia-related behavior.

Bulimia nervosa (BN) has been recognized as a psychological condition since the 1980’s (American Psychiatric Association, 1980) and is characterized by recurring binge eating episodes followed by compensatory mechanisms to prevent weight gain. While its behavioral manifestations have been documented since the early civilization of ancient Egypt and throughout the middle ages (Nasser, 1993) it was Janet, with his groundbreaking paper at the turn of the 20th century entitled Obsession et la Psychasthenie, who first describes it using medical terminology (Pitman, 1984). He reports the case of Nadia, a woman who engaged in compulsive, secretive eating binges that were compensated by purging behavior. With respect to its introduction in the psychological nomenclature, the credit goes to Russell (1979) who addressed the characteristics of BN in almost identical manner to the DSM-III diagnostic criteria: an uncontrollable urge to overeat followed by self-induced vomiting and a strong fear of weight gain.

During the 1980’s and 1990’s, the incidence of BN steadily increased (Hoek & van Hoeken, 2003). While evidence points to a stabilization of rates since the turn of the century (Steinhausen & Jensen, 2015; Reas & Oyvind, 2016), research regarding characteristics of the disorder not included in the diagnostic criteria per se has risen. Inquiries have focused on impulsivity, a trait that is believed to be connected with BN (Lacey & Read, 1993; Oldham et al., 1996; Westen & Harnden-Fischer, 2001; Wonderlich et al., 2005). Defined broadly, impulsivity is understood as poorly planned, prematurely engaged and unnecessarily risky acts that frequently lead to negative consequences (Daruna & Barnes, 1993). Whiteside and Lynam (2001) specifically identified four variations of impulsivity they state cover the various behaviors associated with the construct: negative urgency, lack of premeditation, sensation seeking and lack of perseverance. Negative urgency (NU) is the impulse to reduce negative emotions. Individuals who experience NU act rashly for the purpose of avoiding distress. Lack of premeditation is the challenged ability to plan and postpone action. Sensation seeking is the high value placed in pleasurable behavior at the expense of other factors. Lack of perseverance is a difficulty in persisting in effortful behavior and actions.

With respect to its association to BN, evidence points to NU as most closely connected to this eating disorder. Fischer, Smith and Anderson (2003) conducted a study to determine the connection between two dimensions of impulsivity (urgency and lack of premeditation) and symptoms of BN. Administering two impulsivity scale that measure urgency and planning, they found the association between urgency and BN stronger than that between planning and BN. Similar results were found in another study that looked at these four dimensions of impulsivity with negative urgency shown to be the greater predictor of BN symptoms (Bardone-Cone et al., 2016). Finally, a meta-analysis was conducted to determine the
varying effects of impulsive dimensions and BN. After a review of 50 articles that met their inclusion criteria, results indicate negative urgency has the largest effect size followed by both lack of planning and sensation seeking with the smallest effect attributed to lack of perseverance (Fischer, Smith & Cyders, 2008). The authors go on to describe negative urgency as an emotionally-based dimension (as is lack of planning) and is contrasted to a conscientiousness and sensation seeking dimension for the other two impulsive traits.

The impulse to reduce distress in NU is considered to be an internally driven emotional reaction (Peñas-Lledó et al., 2002) as opposed to externally driven ones characteristic of sensation seeking and lack of planning (Bridgeman & Slade, 1996). Internally-driven behaviors in NU that aim at reducing distress - other than through binging and purging that define the disorder - most commonly include actions such as cutting, drugs of abuse, and the excessive use of alcohol (Solano, Fernández-Aranda, Aitken, López, & Vallejo, 2005; Bulik et al., 2004; Fernández-Aranda et al. et al., 2006; Peñas-Lledó, Vaz, Ramos, & Waller, 2002). These types of behaviors are believed to be the result of an over-anticipation of general distress (Peñas-Lledó et al., 2002) and as such have been associated with anxiety. For instance, (Engel et al., 2005) found that in addition to the impulsive component in BN, there is an anxious-compulsive factor. These results confirmed previous findings documenting an anxious-fearful personality trait (e.g., OCD traits) in individuals with BN (Claes, Vandercycken & Vertommen, 2002; Hudson, Pope, Jonas & Yurgerlun-Todd, 1983; Raymond et al., 1999). Engel et al. conclude that, unlike previously believed, impulsive and compulsive behaviors are not mutually exclusive traits and thus can co-exist in disorders such as BN. Also, anxiety has been shown to predict binge episodes (Arnow, Kenardy, & Agras, 1995; Hohlstein, Smith, & Atlas, 1998). Finally, the aversion to distress and its association with anxiety-based responses operates according to principles of negative reinforcement. The urge to carry on action that temporarily reduces distress becomes self-reinforcing and such emotional dysregulation play a role in the maintenance of BN symptoms (Cassin & von Ranson, 2005; Altman, Campbell, Nelson, Faust & Shankman, 2013).

With respect to externally-driven impulsive behaviors, they are most commonly associated with the sensation seeking and lack of premeditation components observed in individuals with BN. In specific, researchers have focused on kleptomania and sexual promiscuity. Stealing has generated the most focus and consistently documented as the most prominent type of externally driven impulse (Fernández-Aranda et al., 2006; Miyawaki et al., 2018). In one study, half of participants with BN admitted to a history of stealing (Vandereycken & Van Houdenhove, 1996). Comparable results were found in two other studies that looked at this externally-driven impulsive behavior. Mitchell, Fletcher, Gibeau, Pyle, and Eckert (1992) found that individuals with BN are more likely to steal than not and have a pattern of shoplifting different than those without the disorder. Specifically, stealing was found to be impulse driven in BN and is frequently regretted while those without the disorder explained their actions consistently with antisocial personality traits. Along those same lines, Grant and Kim (2002) found individuals with kleptomania frequently have an eating disorder and the majority of them feel shame and guilt over their actions.

In terms of objectives, a first aim of this study is to provide additional evidence individuals with BN significantly differ from individuals who do not have this eating disorder with respect to level of
impulsivity. However, our study will differ from previous ones because it employs a participant-focus inquiry rather than a researcher-based one. Current methodologies are heavily based on response generalization since focus is on generalizing results based on statistical power and demographic characteristics and use one or multiple (preexisting) scales to measure impulsivity. Such scales are lacking in a significant sense as they are designed by researchers and as such are more likely to be reflective of the scientist’s viewpoint on item inclusion criteria rather than by its potential value as an impulse-related statement. By so doing, studies on impulsivity tend to neglect the importance of stimulus generalization. In other words, response generalization focused studies ignore the methodological importance of including a population of statements that comprehensively reflect all aspects of impulsivity – those derived from a population of statements that is comprehensively reflective of the topic under investigation.

A second objective of this study is to provide an additional guiding tool for clinicians treating this disorder more effectively. Treating the impulsive component of BN is also expected to reduce relapse rates since acting on an impulsive urge to binge and purge is a significant contributing factor for such behavior. Evidence supporting this statement is from an analysis of multiple studies looking at relapse rates in BN showing impulsive traits appear to play a significant role in the resumption of binging and purging (Keel & Mitchell, 1997).

Method

Q methodology was designed specifically to understand human behavior by observing a person in operation in their environment and, as a result, have insight into what is psychologically significant to them (Watts & Stenner, 2005). The methodology is so designed because it aims at placing the individual at the center of its inquiry: it studies the person’s viewpoints, not the ones generated from a researcher’s measuring instruments. Scales designed by researchers can be problematic as they assume all individuals have more or less of a certain trait or motivation (e.g., low in introversion, high in openness to experience) when, in fact, it is quite possible for a person to have none of this or that (Brown, 1980). To use this study as an example, impulsivity may be a trait that is non-existent in some and rejected in others with both such operant behaviors not accounted for in scales designed to measure degrees of impulsivity. When persons participating in a study are at the center of the investigation, they are the ones who tell us whether or not they lack a trait all together or have much of it. In other words, they classify themselves so that the viewpoints that emerge in our inquiry is theirs.

Procedure

The first step in Q methodology is to generate a population of statements, called a concourse (Stephenson, 1986), that reflects comprehensively the domain of inquiry. We gathered information from a variety of sources to accomplish this objective. Nine interviews were conducted with university students (five who identified themselves as impulsive and four who did not). They were asked: ‘what does impulsivity mean to you,’ ‘how would you define impulsivity,’ and ‘when do you know if someone is
impulsive.’ This constituted the natural information source and is in line with the self-referent nature of Q methodology (McKeown & Thomas, 2013). Sources from published and audio-visual documents were also utilized to develop the concourse as well as the use of information from academic and popular literature and various media sources in addition to already existing scales of impulsivity such as the Barratt Impulsiveness Scale (BIS, Patton et al., 1995) and the Urgency, Premeditation, Perseverance, and Sensation seeking scale (UPPS, Whiteside & Lynam, 2001).

Our next step was to define the main themes or effects (Stephenson, 1953) that connect with the impulsivity construct based on information acquired from all sources. From this process emerged 22 different elements of impulsivity with each theme representing a certain value related to this construct (Table 1). For example, urgency, gratification and stimulation are some such elements as they are common words associated with impulsivity. Statements were then constructed from those themes and were replicated (so that one endorsed it applied to them while the other did not) for a total of 44 concourse-defining statements. Clarity of statements were tested using focus groups. None of the statements were dropped but some of them were rephrased to increase the clarity of the statements and avoid misunderstandings.

Participants

Participants were twenty-six women from an undergraduate institution on the east coast of the United States (Table 2). Recruited through the psychology’s department online participant system, they ranged from 18 to 21-years of age. Participants were self-placed in two demographic categories: Women with no history of BN (N= 18); women with a history of BN (N= 8). In terms of the single-digit number of participants who report having BN, it is important to point out it is not a concern from a methodological perspective. Since Q methodology is designed to find categories or types of individuals, its objective is not the generalizability of results as is the purpose of R based-methodology. In fact it is quite sufficient to have a handful of participants in order to form a category of interest and, in many applicable instances the intensive analysis of single-case studies (Brown, 2019A). Similarly, concerns about validity do not apply to Q methodology since the placement of statements in a Q Sort is entirely subjective to the participant (Brown, 2019B).

The next step was the administration of the Q sort. Participants rst divided statements in three general categories (indicative of me; neutral of me; contrary of me). The purpose of this step is to create an organized pattern of responses that eventually simplifies the final sorting process. Upon completion of that stage, participants re-sorted statements according to the following condition of instruction: “sort the items according to how indicative they are of you” with a score of + 4 being most indicative, a 0 indicating neutrality, and a score of – 4 being least indicative. All responses occupied one slot so that none were empty, and none had more than one item. Finally, participants were asked to explain the rationale for placing statements in the extremes (+4, +3, -3, -4) since such responses are most indicative of their viewpoints on impulsivity (Table 3).
Results

Factor Extraction and Rotation

Data analysis was performed using PQMethod software (Schmolck, 2014) and factor extraction was performed using the centroid method. Rotation of factors was followed using the manual/judgmental method. While some have argued a judgmental rotation is not best equipped to analyze data since it is approximative rather than mathematically certain (as in a principal component analysis solution) such criticism, in fact, does not account for how science really works. For when we remove a scientist’s ability to use their expertise and judgment based on accrued knowledge and theoretical understanding of the topic under investigation, we fail to recognize the numerous decisions made by researchers throughout the scientific process (H.I. Brown, 2000). Brown and Robyn (2004) explain the value of judgmental rotation by comparing topography (the data itself – a strict mathematical solution) from what lies beneath the ‘surface’ – Operantcy. The latter is where judgmental rotation operates as it allows a deeper looker at the data and may reveal information that may have otherwise been hidden had we remained topographical in our inquiry.

Following rotation two factors were kept for analysis. The decision to retain only two factors was because other factors failed to provide any added significance in the understanding of the phenomena under investigation despite one such factor having two participants significantly loaded on the factor and an Eigen Value > 1.

Factor A: Thinking Through

This factor was endorsed by thirteen of the twenty-six participants of this study. The demographic distribution of relevance to our inquiry reveals that, with the exception of one of the endorsers of this factor, all loaders had no history of BN.

Labelled Thinking Through, the primary characteristic of this factor - as revealed by the high endorsement of specific items - is a tendency towards careful deliberation before taking action. Two items receiving the highest possible factor score (+4) point clearly to such an interpretation: “I thoroughly think through the outcome of a decision before I make it”; “I am usually pretty good at thinking through things before speaking.” The ability to postpone action by thinking through outcomes can be considered the opposite of action by impulse, behavior we have suggested is a common occurrence in individuals with BN.

A third and final item that received a + 4 factor score is a statement related to organized thinking: “My thoughts tend to be organized under most circumstances.” Again, a lack of endorsement of this item by women with a history of BN is not surprising as the statement requires a level of structure usually absent in impulsive behaviors. Furthermore, this explains why the item “I have to plan out my schedule or else I feel lost” was endorsed (+ 3) by individuals who tend to think through their action as planning ahead and structuring is integral to such mindset. In contrast, lacking structure is revelatory of individuals with
impulsive tendencies. During a post-sort interview with a participant who has BN, the person states: “I always do something without thinking of long-term consequences.”

When looking at items that were strongly rejected by endorsers of Factor A we notice further evidence of how planning and postponing action is a central value amongst such individuals. Specifically, they move away from engaging in risky and potentially harmful behavior – “I live life on the edge” (-3); “I persistently and repetitively engage in activities that don’t benefit me” (-4) – as well as learn (early) to not engage in such behavior: “I consistently repeat behaviors that I know aren’t good for me” (-3).

Although less central to how they think (because of a lower negative factor score than items discussed above), there is evidence of an absence of distractibility and procrastination in individuals who have endorsed Factor A. All items below received a score of -2:

- I will do anything other than what I am supposed to be doing until the last minute
- I get so distracted at times that I have difficulty keep attention to my current task
- I tend to shift from one task to the next quite suddenly

Factor B: Negative Urgency and Obsessive Thinking

A total of eight participants endorsed this factor, seven of which reported having BN and one self-categorized as not having a history of BN. Furthermore, only one woman who has BN did not endorse this factor. Three participants rejected Factor B by virtue of their significant negative loadings on this factor. The primary characteristic of the women who endorsed this factor, called Negative Urgency and Obsessive Thinking, reflect an attitude that indicates an obsessive (negative) mindset and difficulty resisting urges that lead to negative outcomes. The fact this factor almost exclusively includes women with BN lines with this paper’s thesis that about impulsivity being a core characteristic of this disorder. Several statements received high scores for the factor (+4 or + 3) and a few others received a significant endorsement as well (+2). With respect to obsessiveness specifically, two of the three items that received the highest rating (+4) delineate such thinking:

- When I experience an unwanted thought, I obsess over it and cannot let it go
- I feel as though my mind is consumed with thoughts

While the second statement doesn’t explicitly state the obsession is an unwanted one, the word ‘consumed’ has a contextually clear negative meaning. Taken together, these statements show well the struggle that is characteristic of someone who feels trapped in obsession and incapable of letting go or controlling negative thinking. In post-sort interviews, a participant with BN who loaded on this factor states she knows some decisions are “not good for me but...will do it because I want it and can’t stop thinking about it until I get what I want.” Another Factor B significant loader shared similar reactions and states: “I know [some] things are bad for me but it’s hard to stop because they are gratifying.”
The mindset described by the sorter above often bleed into other aspects of life. This can be seen by Factor B endorsement of the following statements: *When things start going ‘downhill’, I struggle with regaining control (+4)*; *When I have too much on my mind, it affects my ability to process thoughts and act (+3)*. Furthermore, Factor B endorsers of the statement *I am often unable to regulate life stressors (+3)* shows emotional dysregulation is one consequence of such difficulty. A woman with BN who loaded on this factor explains that “when things go wrong, they tend to feel like life is spiraling” and another states: “it is hard to redirect thoughts when too much is on my mind so I have obsessive thoughts.”

Women with BN just as strongly oppose items that state they cope well with life stressors. This is the case at both specific (*I typically manage to cope with numerous stressful situations*) and general (*I typically manage well despite life stressors*) levels. Both those statements received a -3 factor score.

**Factor B Negative Loadings**

As expected, all three sorters that significantly rejected Factor B - Negative Urgency and Obsessive Thinking - did not have a history of BN. Looking at factor scores of the statement they most strongly reject, a pattern emerges between those three women that focuses on two statements (Table 3). With respect to disagreeing with the item related to the repetition of harmful behavior (statement #25), one participant (#25) stated in her post-sort interview that “for the longest time I’ve been good at recognizing behaviors that are not good for me and stopping those behaviors.” With respect to the statement “*I am often unable to regulate life stressors*” receiving a score of – 4, participants # 6 states being “pretty good at organizing thoughts and am rather insightful.”

**Discussion**

This study aimed at answering the questions: Do women with BN have impulsive traits? And if such is the case, do they differ from women who do not have such history? Using Q methodology, we developed statements representative of various elements of impulsivity and performed a factor analysis to determine answers to our study questions. Two factors emerged from our inquiry that was essentially split along the lines of a presence or absence of a history of BN. In Factor A, Thinking Through, all but one participant reports no history of the disorder. As the name indicates, the primary characteristic of this factor is a focused attention on careful thinking and a deliberative process before action. Women who loaded on this factor rejected acting on impulse, move away from decisions that are likely to harm them, and are able to redirect thinking in a manner that is efficient and emotionally regulated. Factor B, Negative Urgency and Obsessive Thinking, resulted in the opposite of Factor A results: all but one participant reported having BN. The main features of this factor are a difficulty resisting the urge to act – despite knowledge of negative consequences - and a tendency to obsess about an object of desire with little ability to redirect. The psychological consequence of their actions, just as in the binge-purge cycle in BN, is an emotionally dysregulated cycle that often spirals out of control.

Also noteworthy is the rejection of Factor B by a number of participants who did not have a history of BN. Those individuals further confirm how individuals who do not have BN detach themselves from behaving...
in a manner that is emotionally harmful and can take control of actions when they are aware of potential negative consequences. Conversely, no participant significantly rejected Factor A.

**Conclusions**

In terms of overall conclusions, our study provides further evidence of the connection between BN and impulsivity and subsequently reiterates the importance of this aspect of BN nervosa that needs to be considered as part of the diagnostic criteria for this disorder. Also, despite such results not providing any additional insight to the connection between BN and impulsivity, it provides nonetheless an advancement in knowledge because it is the first time individuals with BN were able to scientifically assess their impulsivity employing Q methodology. This is the case because the method used in this study have participants be the sole determinants of their classification with respect to impulsive traits rather than be given an impulsivity ‘score’ derived from a predetermined scale that purports to be objective when, in fact, is based on the scale developer(s)’ point of view.

A second important conclusion from our study is that it highlights specifically which aspects of impulsivity is most descriptive of individuals with BN. Aspects related to negative urgency and obsessive thinking were more strongly endorsed than other aspects that have been found in other studies to be a component of impulsivity, such as planning and perseverance. Our analysis also showed that pleasure seeking is an important element of the difficulty to resist urges as made clear from factor scores and post-sort interviews.

In terms of limitations of this study, we can point to our not being able to determine which aspect of impulsivity is most amenable to change. While we have described characteristic that describe how individuals with BN view themselves our study did not address which aspect of self, as it relates to impulsivity, is someone with this disorder most willing to change. The objective of a future study would be to determine that in specific and would better allow clinicians to be more precise in their intervention as they would target such factors first since considered most problematic for the person with BN.

**Declarations**

**Ethics approval and consent to participate**

This study was approved by Elon’s Institutional Review Board (IRB) chaired by Dr. Stephen Bailey. Reference number for this study is: 19-161.

**Consent for publication**

Not applicable

**Availability of data and materials**
The datasets during and/or analysed during the current study available from the corresponding author on reasonable request.

**Competing interests**

The authors declare that they have no competing interests.

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**Authors' contributions**

BG: Conceptualized the study and reviewed literature, conducted search for potential participants, wrote the manuscript, oversaw interviews, analyzed and interpreted the data.

LB: Conducted search for potential participants, scheduled participants for study. Oversaw participant completion of statement sorting, conducted post-sorting interviews, interpreted the data, edited the manuscript, approved final manuscript.

GB: Oversaw participant completion of statement sorting, conducted post-sorting interviews, interpreted the data, edited the manuscript, approved final manuscript.

BH: Oversaw participant completion of statement sorting, conducted post-sorting interviews, interpreted the data, edited the manuscript, approved final manuscript.

AG: Oversaw participant completion of statement sorting, conducted post-sorting interviews, interpreted the data, edited the manuscript, approved final manuscript.

CB: Oversaw participant completion of statement sorting, conducted post-sorting interviews, interpreted the data, approved final manuscript.

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**Authors' information**

Bilal Ghandour is Assistant Professor in the Psychology Department at Elon University, His research focuses on the connection between emotional disorders and eating disorders. He is also a licensed Clinical Psychologist with a private practice in Charlotte, NC where he specializes in eating disorders and self-harm behaviors.

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**Tables**

Due to technical limitations, Tables 1 - 5 are only available for download from the Supplementary Files section.

**Supplementary Files**

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