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The Role of Impulsivity in Women with Bulimia Nervosa using Q Methodology

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This study explores the link between bulimia nervosa and impulsivity. Using Q methodology, twenty-six women with or without a history of bulimia nervosa ranked statements reflective of impulsivity. Results showed that two factors were generated, indicating two statistically distinct ways of responding. Participants who loaded on factor A were characterized by their structured approach around decision-making, thinking through consequences of actions, and tendency towards planning/organization. In all but one participant, this factor was represented by participants with no history of bulimia nervosa. Participants who loaded on factor B were characterized by pleasure-seeking urges, quick action, lack of self-control, and difficulty in postponing reward. This factor, except for one participant, consisted of individuals with a history of bulimia nervosa. In conclusion, the current study provides an evidence for a pattern of impulsivity in women with bulimia nervosa not found in their healthy counterparts.

Keywords: impulsivity, bulimia nervosa, Q methodology

Bulimia nervosa (BN) has been recognized as a psychological condition since the 1980s (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 only at the turn of the 20th century that it was described using medical terminology (Pitman, 1984). BN has traditionally been considered to be a condition that primarily affects individuals from Western-industrialized countries; however more recent cross-cultural studies have suggested that individuals from non-Western countries are just as susceptible (Dryer et al., 2014). In the 1980's, Japan was one of the first Asian countries to report eating disorders. While early findings suggested significantly reduced risk, Japan has experienced a consistent increase in cases over the past 40 years and numbers are now estimated to be similar to those in Western countries (Pike et al., 2020). During the 1980s and 1990s, the incidence of BN steadily increased (Hoek & van Hoeken, 2003). While evidence points to stabilization of rates since the turn of the century (Reas & Oyvind, 2018; Steinhausen & Jensen, 2015), research regarding characteristics of the disorder has increased. Inquiries have

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focused on impulsivity, a trait that is believed to be connected with BN (Khairallah et al., 2019; Lacey & Read, 1993; Oldham et al., 1996; Seitz et al., 2013; 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; Naomi et al., 2018). Whiteside and Lynam (2001) identified four specific variations of impulsivity which cover 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 in order to avoid 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 with BN, evidence points to NU as most closely connected to this eating disorder. Fischer et al. (2003) conducted a study to determine the connection between two dimensions of impulsivity (urgency and planning/lack of premeditation) in women with BN and found the association between urgency and BN to be stronger than that between planning and BN. Similar results were found in two other studies which looked at these four dimensions of impulsivity with negative urgency shown to be the greater predictor of BN symptoms (Bardone Cone et al., 2016; Davis et al., 2020).

The impulse to reduce distress in NU is considered to be an internally driven emotional reaction (Peñas-Lledó et al., 2002; Wierenga et al., 2020) as opposed to externally driven ones characteristic of sensation seeking and lack of planning (Bridgeman & Slade, 1996; Reas et al,, 2016). Internally-driven behaviors in NU which aims 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 (Bulik et al., 2004; Peñas-Lledó et al., 2002; Pisetsky et al., 2016; Solano et al., 2005). These types of behaviors are believed to be the result of over-anticipation of general distress (Peñas-Lledó et al., 2002).

Concerning externally-driven impulse, stealing has generated the most focus and consistently documented as the most prominent type of externally driven impulse (Miyawaki et al., 2018). Mitchell et al. (1992) found that individuals with BN are more likely to steal and have a pattern of shoplifting different from 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. More recently, a nationwide study in Sweden found that women convicted of theft, have a significantly higher conviction rate than those who have not been exposed to an eating disorder (Yao et al., 2017).

Rationale

This study is valuable because, unlike previous studies linking impulsive traits to BN, it employs a participant-focus inquiry rather than a researcher-based one. Current methodologies are heavily based on response generalization since the 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. These response generalization focus studies ignore the methodological importance of including a population of

statements which comprehensively reflect all aspects of impulsivity, and those derived from a population of statements that is comprehensively reflective of the topic under investigation.

Aim of the Study

The aim of this study is to raise further awareness amongst clinicians of the necessity to treat the impulsive component of BN. If such an aspect of the disorder is treated, it is 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 can be gauged from an analysis of multiple studies of relapse rates showing impulsive traits which appear to play a significant role in the resumption of binging and/or purging (Davis et. al., 2020; Keel & Mitchell, 1997).

Hypotheses of the Study

The current study expects individuals with BN to demonstrate a significantly higher level of impulsivity than individuals with no history of this eating disorder. This will be indicated in traits that explain human behavior:

- Traits reflecting attitudes which indicate an obsessive (negative urgency) mindset and difficulty resisting urges that lead to negative outcomes are expected to be associated with women with a history of BN.
- Traits that reflect a tendency towards careful deliberation before taking action are expected to be associated with women with no history of BN.

Method

Research Design

Q methodology was designed specifically to understand human behavior by observing a person operating in their environment and, as a result, provide 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 altogether or have much of it. This allows participants to classify themselves so that the viewpoints that emerge in our inquiry are specifically theirs.

Participants

Participants were twenty-six (*N = 26)* women from an undergraduate institution on the east coast of the United States, recruited through the Psychology department's online participant system. They ranged from 18 to 21-years of age (Table 1). A total of $n = 18$ women reported having no history of BN, while $n = 8$ women reported having a history of BN.

Table 1
Demographic Characteristics of Women with and without a History of Bulimia Nervosa

College Level	Age (Years)			
	18	19	20	21
1st Year	6	1	-	-
Sophomore	7	4	-	-
Junior	-	3	1	-
Senior	-	-	-	4

In terms of the single-digit number of participants who reported having BN, it is important to point out that this 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).

Procedure

The first step in Q methodology is to generate a population of statements, called a concourse (Stephenson, 1986), that comprehensively reflects the domain of inquiry. The researchers gathered information from a variety of sources to accomplish this objective. Nine interviews were conducted with university students (n = 5; who identified themselves as impulsive and n = 4; 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) were also used.

Our next step was to define the main themes or effects (Stephenson, 1953) that connect with impulsivity based on information acquired from all sources. From this process, emerged six major themes that reflect general categories of impulsivity. Several elements or sub-categories were then derived from these major themes. The flow chart from major themes to sub-categories is presented in Figure 1. Statements were then constructed from those themes and were replicated (so that one endorsed it, while the other did not) for a total of 44 concourse-defining statements. Examples of sub-categories, resulting statements, and impulsivity valence are presented in Table 2. Clarity of statements was tested using focus groups. None of the statements were dropped, but some were rephrased to increase the clarity of the statements and avoid misunderstandings.

Figure 1

Major Themes and Categories of Impulsivity

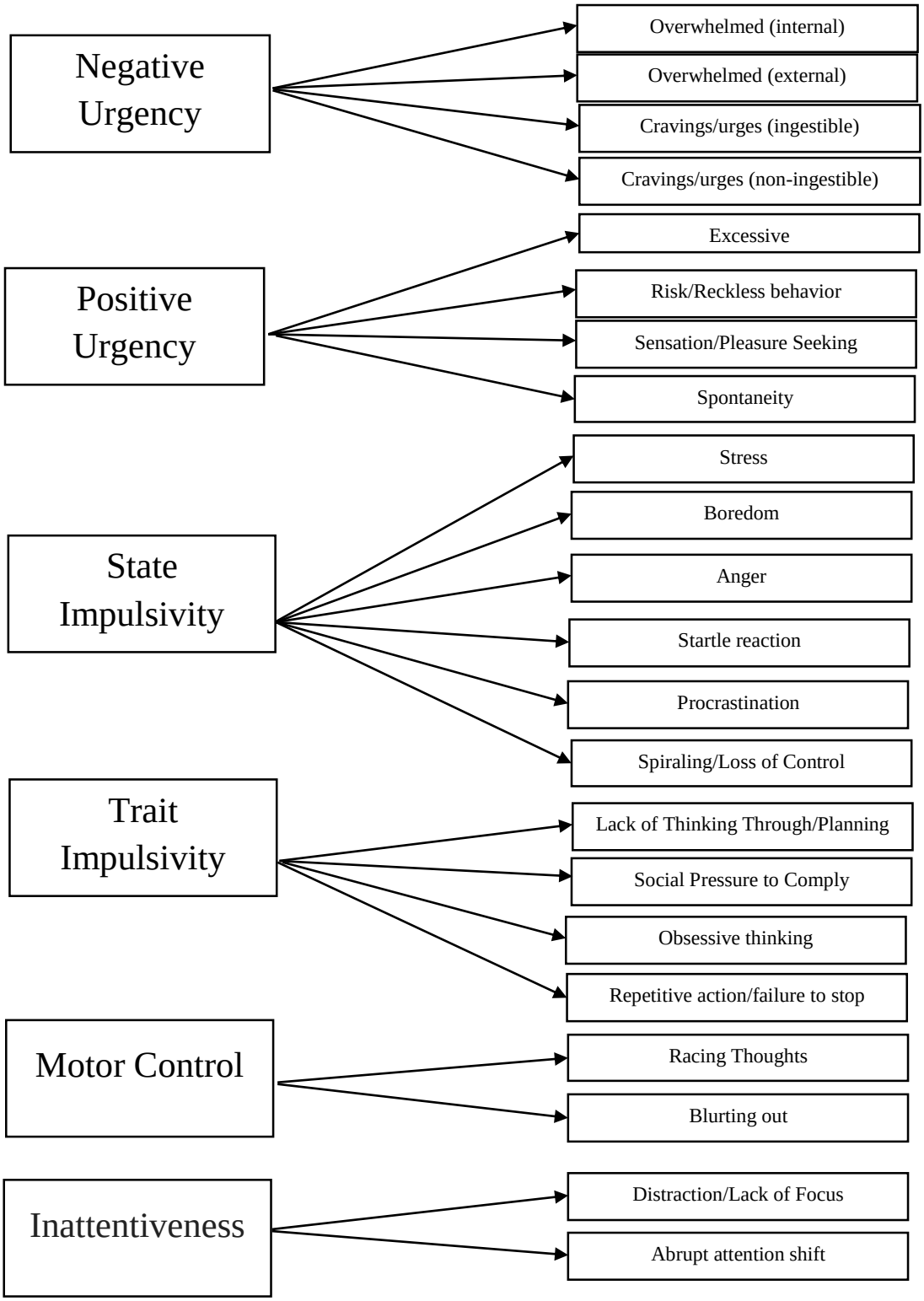

Table 2
Sample Sub-Categories and Resulting Statements of Impulsivity

Theme	Statement	Impulsivity Valence
Overwhelm	When I have too many things to think about, it affects my ability to think and act	Positive
Risky behavior	I live life on the edge	Positive
Spontaneity	I find it hard to do things spur of the moment	Negative
Pleasure-seeking	If something makes me happy or feels good, I do it every chance I get	Positive
Thinking Through	I thoroughly think through the outcome of a decision before I make it	Negative
Obsession	When I experience an unwanted thought, I obsess over it and cannot let it go	Positive
Surprise	I can easily adjust to unexpected situations	Negative
Cravings/urges	If I start thinking about a cookie, I have to get one	Positive
Racing Thoughts	My mind is consumed with thoughts	Positive

The next step was the administration of the Q sort. Participants first divided statements into three general categories (indicative of me; neutral of me; contrary of me). The purpose of this step was to create an organized pattern of responses which eventually simplified 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).

Table 3
Distribution Structure of the 44 item Q Sort

LEAST INDICATIVE OF ME					*MOST INDICATIVE OF ME*			
+4	+3	+2	+1	0	-1	-2	-3	-4
1	4	8	13	19	27	33	38	42
2	5	9	14	20	28	34	39	43
3	6	10	15	21	29	35	40	44
	7	11	16	22	30	36	41	
		12	17	23	31	37		
			18	24	32			
				25				
				26				

Ethics Approval and Consent to Participate

This study was approved by Elon University IRB Committee. The reference number for this study is: 19-161. A written informed consent was obtained from all participants, and all were briefed about the confidentiality of the information they disclosed.

Results

Factor Extraction and Rotation

Data analysis was performed using Q Method 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 that a judgmental rotation is not best equipped to analyze data since it is approximatively, rather than mathematically, certain (as in a principal component analysis solution), such criticism does not account for how science really works (Brown, 2000). For when a scientist's ability to use their expertise and judgment based on accrued knowledge and theoretical understanding of the topic under investigation is removed, Brown (2000) indicates that this is tantamount to a failure in recognizing the numerous decisions made by researchers throughout the scientific process. Brown and Robyn (2004) explain the value of judgmental rotation by comparing topography (the data itself – a strict mathematical solution) and what lies beneath the 'surface' operantcy. The latter is where judgmental rotation operates, as it allows a deeper look at the data. This may reveal information otherwise hidden had researchers 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 of the understanding of the phenomena under investigation.

Factor A: Thinking Through

This factor was endorsed by thirteen (n = 13) of the twenty-six participants of this study. The demographic distribution of relevance to our inquiry reveals that, except for one factor endorser, all loaders had no history of BN.

Labeled 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, a behavior the current study has suggested to be 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 stated "I always do something without thinking of long-term consequences."

When looking at items that were strongly rejected by endorsers of factor A, researchers noticed further evidence of how planning and postponing action is a central value amongst such individuals. Specifically, they moved 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 learnt (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 maintaining 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 had 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, reflected an attitude which indicates an obsessive (negative) mindset and difficulty resisting urges that lead to negative outcomes. The fact that this factor almost exclusively includes women with BN, aligns with this paper's thesis that impulsivity is 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). For obsessiveness specifically, two of the three items that received the highest rating (+4) delineated 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 that 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 stated that she knew some decisions were "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 stated: "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 bleeds into other aspects of life. This can be seen by factor B endorsement of the following statements (Table 4): *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) show that 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 stated: "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 which state that 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.

Table 4
Q Statements and Factor Arrays – Two-factor Solution

Statements	Factor A	Factor B
1- When I have too much on my mind, it affects my ability to process thoughts and act	2	3
2- **I typically manage to cope with stressful situations** [a]	1	**-3**
3- I have to plan out my schedule or else I feel lost	3	2
4- I am very "go with the flow" and don't need to follow a schedule	-4	-2
5- If I start thinking about a cookie and want one, I have to get one	-1	1
6- **Even if I crave to eat something, I can resist having it right now**	1	-3
7- When I have a strong urge to do something, I can't stop myself from taking action	-2	2
8- **I find it easy to resist urges**	1	-3
9- **I persistently and repetitively engage in activities that don't benefit me**	-3	2
10- I live a moderate and non-extravagant lifestyle	0	0
11- I live life on the edge	-4	-1
12- I am not a risk-taker	1	0
13- If something makes me happy or feels good, I do it every chance I get	2	0
14- **I am willing to do mundane tasks because it's part of life**	3	0
15- I am spontaneous	-1	-1
16- I find it hard to do things spur of the moment	1	0
17- It is easy for me to get bored	0	2
18- I can stay engaged no matter the activity	0	-2
19- **I lash out when I get angry**	-3	1
20- When I am angry I can still process information	2	-2
21- When I am surprised I don't know how to react	-1	1
22- **I can easily adjust to unexpected situations**	0	-4
23- I will do anything other than what I am supposed to be doing until the last minute	-2	1
24- **Even if I don't like what I am doing, I will still complete it in a timely manner**	3	0
25- **When things start going downhill, I struggle with regaining control**	-1	4
26- When things start going 'south,' I can pick myself up and move forward	1	-2

Statements	Factor A	Factor B
27- **I am often unable to regulate life stressors**	-3	3
28- **I typically manage well despite life stressors**	2	-3
29- **I thoroughly think through the outcome of a decision before I make it**	4	-1
30- I frequently rush through decisions	-4	-1
31- I feel pressure by others to fit in	0	1
32- I have a strong sense of individuality regardless of others' opinions	2	0
33- **When I experience an unwanted thought I obsess over it and cannot let it go**	-1	4
34- **When I experience an unwanted thought, I can easily redirect it**	0	-4
35- **I consistently repeat behaviors I know aren't good for me**	-3	3
36- **I can easily recognize and stop a behavior that is not beneficial for me**	3	-4
37- **My thoughts tend to be organized under most circumstances**	4	-1
38- **I feel as though my mind is consumed with thoughts**	0	4
39- I find that I am often quick to say what comes to mind	0	2
40- **I am usually pretty good at thinking through things before speaking**	4	-1
41- I get so distracted at times that I have difficulty maintaining attention to my current task	-2	1
42- My attention is pretty sharp; I am rarely distracted or lose focus of what I am doing	0	-2
43- **I am not great at adapting to sudden changes that affect my normal routine**	-1	3
44- I tend to shift from one task to the next quite suddenly	-2	2

[a] Statements in bold represent distinguished statements at both extremes (+3, + 4, -3, -4)

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 amongst the three women focusing on two statements (Table 5). With respect to disagreeing with the item related to repetition of harmful behavior (statement #35), 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." Concerning the statement *"I am often unable to regulate life stressors"* participants # 6 received a – 4 score and stated being "good at organizing thoughts and am rather insightful."

Table 5
Select Statements and Factor Scores of Participants Rejecting Factor B

Statement	Participant # 6	Participant # 25	Participant # 26
35- I consistently repeat behaviors that I know aren't good for me	-4	-4	-3
27- I am often unable to regulate life stressors	-4	-3	-3

Discussion

This study aimed at answering the question: Do women with BN have impulsive traits and do they differ in this respect from women who do not have such history? Using Q methodology, researchers developed statements representative of various elements of impulsivity and performed a factor analysis to determine answers to our study question. Two factors emerged from our inquiry which 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 reported no history of the disorder. As the name indicates, the primary characteristic of this factor 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 which are likely to harm them, and can 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 several 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.

Conclusion

In terms of a general conclusion, our study provides further evidence of the connection between BN and impulsivity. Subsequently, it points to the importance of considering impulsivity as a diagnostic criterion for this disorder and will help clinicians in their treatment strategies when working with individuals who have BN.

Implications

Our study has two major implications. The first implication is that it provides an advancement in knowledge because it is the first-time individuals with BN were able to scientifically assess their impulsivity by employing Q methodology. This is the case because the method used in this study has participants a sole determinants of their classification with respect to impulsive traits rather than be given an impulsivity 'score' derived from a predetermined scale which purports to be objective when, in fact, it is based on the scale developer(s)' point of view.

The second implication of 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 which 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. This is a highly relevant implication in the context of therapeutic intervention. Since BN has many components, and treatment can be challenging, clinicians can focus on the elements that are most likely to be present in a person with bulimia nervosa, and such targeted intervention can provide significant relief when addressed.

Limitations and Suggestions

In terms of limitations of this study, researchers recognize that the study was only conducted with women. Future research would need to look at the role of impulsivity in a men population. Furthermore, the study can be considered limited in scope as it was conducted in a university setting, with a limited age range, and limited cultural diversity. While it is believed that the results provided are expected to hold for different age groups, education level, and culture, it would still be important to conduct such a study with a more diverse population. Furthermore, regarding the importance of assessing cultural differences, it would be important to conduct this study with an Asian population, since the evidence of eating disorders and impulsive eating is on the rise in this part of the world.

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