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The Relationship between Intolerance of Uncertainty and Problematic Eating Behaviors

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Abstract

Intolerance of uncertainty(IU) is defined as the tendency to perceive and react negatively to uncertain situations regardless of the actual probability of the feared outcomes. IU has been suggested as a transdiagnostic risk factor for emotional disorders. Despite a wealth of evidence for the role of IU in anxiety and depressive disorders, research investigating the association between IU and Eating Disorders(EDs) is limited. Thus, the present study examined the association between IU and problematic eating behaviors among college students.

In Study I, a short-version of the Intolerance of Uncertainty Scale(IUS-12) was translated into Korean and the psychometric properties of IUS-12 were evaluated. First, Exploratory Factor Analysis(EFA) was performed using responses from 201 undergraduates students enrolled in an introductory psychology classes at Seoul National University. EFA yielded two factors and each factor was consisted of items that were nearly identical to original IUS-12 except item 3 and 11. Two factors were named 1) Prospective Intolerance of Uncertainty(P-IU) and 2) Inhibitory Intolerance of Uncertainty(I-IU). Confirmatory Factor Analysis(CFA) using independent undergraduates students sample(N=498) supported a two factor structure of K-IUS-12 extracted from EFA. The K-IUS-12 total scale demonstrated excellent internal consistency and construct validity.

The aim of Study II was to investigate the unique association of IU with problematic eating behaviors and examine potential mediating role of overvaluation of shape and weight and food craving in the relationship between IU and problematic eating behaviors. The results showed that IU accounted for a significant variance in dietary restraint, after controlling for gender and perfectionism. IU also explained an additional variance in binge eating beyond and above gender and negative urgency. To clarify the psychological process underlying the relationship between IU and disordered eating behaviors, indirect effect of IU on dietary restraint via overvaluation of shape and body and indirect effect of IU on binge eating via food craving were examined separately. Both indirect effects of IU on dietary restraint and binge eating were statistically significant.

The present study suggests that the K-IUS-12 is a reliable and valid measure for assessing levels of difficulty tolerating uncertainty in undergraduates sample. The results of the study indicate that individuals who are intolerant of uncertainty may engage in dietary restraint in order to gain certainty and perceived control, while others may engage in binge eating as a maladaptive strategy to manage uncertainty and negative affect. Finally, the implications and limitations of this study, and suggestions for future studies were discussed.

Keywords : Intolerance of Uncertainty, Problematic Eating Behaviors, Overvaluation of Shape and Weight, Food Craving

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Introduction

Faith means living with uncertainty-feeling
your way through life, letting your heart
guide your life as lantern in the dark.
- Dan Millman-

Intolerance of Uncertainty(IU) is defined as a dispositional characteristic that results from a set of negative beliefs about uncertainty and its implications and involved the tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events(Buhr & Dugas, 2009). Individuals who are intolerant of uncertainty experience anxiety and negative affect in uncertain situations even when the potential threat is negligible. Individuals with IU rely on maladaptive strategies such as worrying, obsessions, compulsions, rituals and avoidance in order to reduce uncertainty and negative affect and to gain the perception of control over unknown future outcomes(Boswell, Thompson-Hollands, Farchione, & Barlow, 2013).

IU has been established as a strong transdiagnostic vulnerability that independently contributes to a broad number of emotional disorders. A robust evidence suggests that IU is a risk factor for pathological worry(Sexton, Norton, Walker, & Norton, 2003), and IU has been proposed as a key maintaining factor in cognitive models of

Generalized Anxiety Disorder(GAD; Behar, DiMarco, Hekler, Mohlman, & Staples, 2009). Furthermore, IU has been found to significantly predict symptoms of GAD(Laugesen, Dugas, & Bukowski, 2003), obsessive compulsive disorder(OCD; Steketee, Frost, & Cohen, 1998), depression,(Yook, Kim, Suh, & Lee, 2010), specific phobia(McEvoy & Mahoney, 2011), social anxiety disorder(SAD; Boelen & Reijntjes, 2009), panic disorder(Carleton et al., 2014), and agoraphobia(McEvoy & Mahoney, 2011). More recent evidence(McEvoy & Mahoney, 2012) revealed that IU partially mediated the association between neuroticism and symptoms of a number of emotional disorders, including GAD, OCD, SAD, agoraphobia, panic disorder, and depression. However, indirect pathway explained more variance in GAD symptoms(i.e., worry) than symptoms of the other emotional disorders. Accordingly, IU appears to be associated with a various emotional disorders, though its relative importance for a broad range of emotional disorders requires further investigation. For instance, Dugas, Marchand, and Ladouceur(2005) found that patients with GAD showed significantly higher levels of IU than patients with panic disorder with agoraphobia. In another study, patients with comorbid GAD and Major Depressive Disorder(MDD) reported significantly higher IU than those with either GAD or MDD only(Yook, Kim, Suh, & Lee, 2010).

According to Barlow's triple vulnerability model of emotional disorders, specific emotional disorders may represent different manifestations of a common underlying biological and psychological

mechanisms of psychopathology. If IU is shown to be a common vulnerability factor across multiple emotional disorders, it would have significant implications for the development of transdiagnostic interventions of these disorders(Brown & Barlow, 2009).

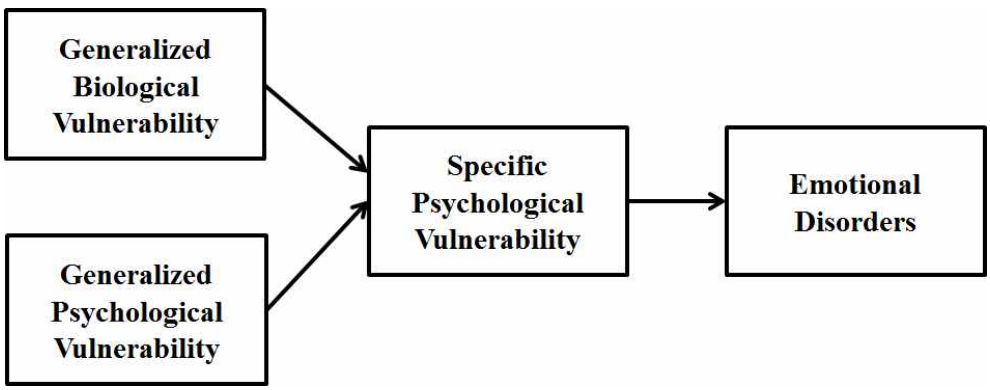


Figure 1. Barlow's Triple Vulnerability Model

There is growing evidence that IU is also associated with Eating Disorders(EDs), although the relative importance of this association compared to that of IU and symptoms of other emotional disorders requires further research. Considering shared genetic, neural and behavioral mechanisms underlying EDs and anxiety disorders(Kaye et al., 2004; Mineka & Ohman, 2002; Strober, Freeman, Lampert, & Diamond., 2007), investigating the role of IU in EDs may help clarify unique cognitive processes that contribute to anxiety in EDs. A growing body of quantitative and qualitative research investigating the relationship between IU and EDs has supported that IU and desire for control are evident in individuals with EDs(Sternheim et

al., 2011). Furthermore, individuals with problematic eating attitudes showed significantly higher levels of IU than individuals with normal eating attitudes(Konstantellou & Reynolds, 2010). IU may be a common vulnerability factor accounting for high levels of anxiety, perfectionism, and obsessional trait found in individuals with symptoms of EDs, manifested by high rates of comorbidity with anxiety and obsessive compulsive disorders(Cassin & von Ranson, 2005; Kaye et al., 2004).

The Association between Intolerance of Uncertainty and Eating Disorders

Eating Disorders

Eating Disorders(EDs) are severe and debilitating psychiatric disorders with high mortality and suicide rates(Jenkins, Hoste, Meyer, & Blissette, 2011; Kesby, Maguire, Brownlow, & Grisham, 2017). They are characterized by overvaluation of body shape and weight, as well as disordered eating and eating-related behaviors, such as dietary restraint, binge eating, and purging(American Psychiatric Association, 2013). Anorexia Nervosa(AN) is characterized by severe emaciation following food refusal and failure to maintain a minimum body weight, whereas individuals with Bulimia Nervosa(BN), mostly at normal weight, routinely binge on large amounts of food followed by compensatory behaviors(e.g., self-induced vomiting) to avoid weight gain(Frank et al., 2012). Treatment outcomes of EDs are poor, and

treatment itself is often characterized by poor patient adherence, frequent dropout, and high rates of relapse(Carter, Blackmore, Sutandar-Pinnock, & Woodside, 2004; Steinhausen, 2002). The acknowledgement of a group of patients who have undergone a prolonged and refractory course of illness, known as a 'severe and enduring eating disorder'(SEED; Robinson, 2009; Treasure, Stein, & Maguire, 2015), illustrates the importance with which research focusing on advances in our understanding of this complex group of EDs is required to enhance treatment effectiveness.

Anxiety and fear regarding weight gain constitute fundamental components of ED psychopathology(Kesby et al., 2017). This is clearly demonstrated in patients with AN and BN who are preoccupied with concerns about eating, shape, and weight to the point of obsession and engage in maladaptive eating behaviors to avoid feared outcome. The clear manifestations of anxiety symptoms in EDs have been supported by an extensive literature base, implicating the role of anxiety in the development and maintenance of EDs(Godart et al., 2003; Pallister & Waller, 2008). Comorbid anxiety disorders are commonly reported across EDs(Bulik, Sullivan, Fear & Joyce, 1997) and high levels of anxiety predicted unsuccessful treatment outcomes and poor prognosis in EDs(Bloss et al., 2011).

A number of the core clinical features of EDs overlap with cognitive and behavioral manifestations of anxiety disorders(Kesby et al., 2017; Steinglass et al., 2011). For instance, an excessive fear of weight gain; the development and rigid reliance on rules and safety

behaviors(e.g., restraint, calorie counting, vomiting, body checking) to cope with these fears; and the arrangement of these behaviors around a set of dysfunctional beliefs(e.g., overvaluation of shape and weight; Steinglass et al., 2011). In spite of the accumulating literature demonstrating the importance of anxiety in ED psychopathology, the potential mechanisms linking anxiety and eating pathology are largely unknown. Researchers should take well-established cognitive model of anxiety disorders into considerations in order to expand our understanding of the characteristics of fear and anxiety in EDs and the range of dysfunctional behaviors used to manage anxiety(Kesby et al., 2017).

Intolerance of Uncertainty and Eating Disorders

A preliminary qualitative study investigating a role of IU in patients with AN reported that the most profound source of uncertainty found in patients with AN included fear of negative evaluation from others and a sense of imperfection(Sternheim et al., 2011). Patients with AN described feeling of uncertainty in terms of physical threatening such as feeling 'suffocated' or feeling 'overwhelmed and out of control'(Sternheim et al., 2011). Patients also reported an effort to avoid uncertainty at all cost and augment certainty both in treatment, and across nearly all areas of life through double-checking, adhering to rigid rules or routines, and avoiding unfamiliarity(Sternheim et al., 2011). These findings are in line with the research suggesting that a lack of planning or control over eating

might result in significant anxiety among patients with EDs(Webb et al., 2011).

Patients with EDs also reported that restriction of food-intake helped create a sense of security or familiarity when confronted with uncertainty(Sternheim et al. 2011). Patients also appeared to doubt their own ability to manage the unavoidable uncertainty around life. However, this qualitative study had several limitations including a small sample size(N=9), unreported comorbidities, and a sample with a high degree of AN severity. Therefore, it is unclear whether the reported experiences can be generalized to the full spectrum of AN severity. Furthermore, the study did not address whether patients found uncertainty intolerable prior to the onset of AN. Despite these limitations, this body of work illustrated the urgency of further empirical investigation of IU in ED populations.

In support of a qualitative study, Konstantellou and Reynold(2010) reported that individuals with problematic eating attitude showed higher levels of uncertainty compared to individuals with normal eating attitude. This findings had been replicated and extended using clinical samples. For instance, individuals with EDs showed higher levels of IU than healthy control group(Konstantellou, Campbell, Eisler, Simic, & Treasure, 2011). Frank et al. (2012) reported that both AN and BN were associated with elevated levels of IU and trait-anxiety compared to healthy control group. This association remained significant for patients without comorbid emotional disorders. Also, higher levels of IU were positively related to ED

severity, body dissatisfaction, and drive for thinness. Another study also suggested that IU might be associated with social and emotional processing deficit in patients with AN(Abbate-Daga, Quaranta, Marzola, Amianto, & Fassino, 2015). These qualitative and quantitative studies provide the rationale for further empirical investigation of the role of IU in EDs.

Exploring the Potential Mediating Mechanisms of a Link between IU and Eating Disorders

According to Barlow's triple vulnerability model, the manifestations of IU may differ between specific problems areas(e.g., worry in GAD, checking behaviors in OCD, dietary restraint in ED). Thus, empirical studies are required to elucidate the mediating pathway that accounts for the relationship between IU and EDs. Theoretically, identifying mediating mechanisms is crucial to understand etiology and processes that lead to EDs. Although burgeoning evidence has demonstrated the association between IU and disordered eating behaviors, little research has explored the potential mediating mechanisms linking IU with EDs.

Overvaluation of Shape and Weight

Overvaluation of shape and weight is defined as 'undue influence of body shape or weight on self-evaluation' and is a key diagnostic feature of AN and BN(APA, 2013). Renjan et al(2016) suggested that

IU might contribute to the arrangement of rigid beliefs around eating, shape, and weight as an attempt to maximize predictability and perceived control, which in turn lead to dietary restraint. According to Fairburn's transdiagnostic model and schema theory(Fairburn et al., 2003a; Luck, Waller, Meyer, Ussher, & Lacey., 2005), overvaluation of shape and weight indicate higher-order cognitive process incorporating core negative beliefs about the self that could be manifested by automatic negative thoughts or dysfunctional assumptions about shape and weight. In contrast to body dissatisfaction, which may be differed across mood or current body shape, overvaluation of shape and weight appear to be stable over time and situations(Cooper & Fairburn, 1993; Fairburn, 2003).

One study examined the effect of IU and overvaluation of shape and weight on dietary restraint using a clinical sample(Renjan et al., 2016). This study reported that IU had the significant indirect effect on dietary restraint via overvaluation of shape and weight. IU also had the direct effect on dietary restraint(Renjan et al. (20I6). These results need to be replicated with both clinical and non-clinical samples, as it was the first study to investigate the association of IU and overvaluation of shape and weight in EDs.

Food Craving

Food craving refers to 'an intense desire or urge to eat specific foods of which chocolate is the most often craved one among other highly palatable foods'(Weingarten & Elston, 1990, 1991). Excessive

food craving has been associated with increased food intake in dieters(Fedoroff, Polivy, & Herman, 1997), overeating in both normal and obese individuals(Bjoervell, Roenberg, & Roessner, 1985), and binge eating in female individuals with BN(van der Ster Wallin et al., 1994). According to previous studies(Weingarten & Elston, 1991), food cravings were closely associated with negative affect as an antecedent to binge eating. Waters et al. (2001) suggested that the function of food craving might be to engage in binge eating as a means of getting relief and being restored from the intolerable negative affect. Negative affect has been reported to undermine the ability to maintain strict control over eating, thus leading to overeating(Fairburn, Welch, Doll, Davies, & O'connor, 1997). Considering these findings, IU and related distress may lead to binge eating via food craving as a maladaptive coping strategy.

IU and other ED-related Constructs

In spite of a wealth of research on IU over the past decade, distinguishing IU from conceptually relevant psychological constructs has rarely received clinical attention. The potential overlap between IU and other central constructs involved in the ED literature, such as perfectionism and several dimensions of perceived control, are noteworthy and ask for further investigation(Kesby et al., 2017).

Perfectionism

Perfectionism is referred to as a personality trait in which individuals set exceedingly high standards for themselves. Studies of OCD showed that both perfectionism and IU being closely tied to obsessions of control and urgency of thoughts, as well as compulsions of checking and ordering. Furthermore, relationship between perfectionism and severity of OCD was fully mediated by IU, indicating that beliefs around perfectionism may be driven by intolerance of uncertainty, such that many perfectionistic beliefs are the results of an incapability of tolerating not knowing a future consequence(Reuther et al., 2013). Given a high prevalence of OCD among patients with EDs and a functionally similar clinical presentations(Altman & Shankman, 2009), investigating the association among IU, perfectionism, and dietary restraint may help clarify a common underlying mechanism between OCD and EDs.

Negative Urgency

Negative Urgency(NU) refers to an individual's tendency to engage in impulsive behavior while experiencing negative affect, and has been known as a dispositional characteristic that is strongly associated with bulimic symptoms(Anestis, Selby, & Joiner, 2007). According to an emotion regulatory model, individuals engage in binge eating as a maladaptive attempt to alleviate negative affect. In a similar vein, several studies have found that NE plays a

particularly crucial role in this process(Anestis et al., 2007; Fischer, Peterson, & McCarthy, 2013). Pawluck & Koerner(2010) reported a moderately positive association between IU and NU, and the mediating effect of IU in the association between NU and GAD. Though the association between IU and NU have not, to our knowledge, been explored within the field of EDs, it is reasonable that individuals with difficulty tolerating uncertainty may be motivated to engage in impulsive binge eating to reduce uncertainty and related emotional distress rather than enduring a period of uncertainty.

Overview of the Present Study

Previous studies consistently reported that EDs are prevalent in college populations. The prevalence of EDs of college students in Korea has been reported to be 12%(Medical Tribune, 2013). Problematic eating behaviors are maladaptive practices pertaining to eating disorders such as dietary restraint, binge eating that do not satisfy a psychiatric diagnosis of EDs, such as AN and BN. Therefore, identification of subthreshold levels of EDs and providing the effective interventions may prevent the development of a full-blown EDs. Given the detrimental physiological effects of EDs, increased mortality, and high levels of psychiatric comorbidity, early detection of ED symptoms may significantly improve the prognosis of illness as well as quality of life. IU may be a crucial yet relatively

underestimated construct within the ED literature. Despite a preliminary evidence indicating that IU may also be a vulnerability factor of disordered eating behaviors, research investigating the relationship between IU and problematic eating behaviors is limited. Accordingly, the present study aims to investigate the role of IU in problematic eating behaviors(dietary restraint and binge eating) and examine indirect effects of IU on problematic eating behaviors via proposed mediators.

The purpose of Study I is to examine the psychometric properties of an abridged version of the Intolerance of Uncertainty Scale(IUS-12) in a sample of undergraduate students, using the Korean version of the questionnaire. Exploratory and Confirmatory Factor Analyses were conducted to examine the factor structure. After selection and validation of the best fitting model, psychometric properties of the K-IUS-12 were evaluated.

In Study II, a series of hierarchical linear regressions was performed in order to examine unique contribution of IU to dietary restraint and binge eating. Furthermore, indirect effect of IU on dietary restraint and binge eating was examined in order to explore psychological mechanisms that elucidate the link between IU and problematic eating behaviors. For dietary restraint, indirect effect of IU on dietary restraint through overvaluation of shape and weight was examined. Indirect effect of IU via food craving was examined for binge eating.

Study I. Development of the Korean version of a short-form of the Intolerance of Uncertainty Scale(K-IUS-12)

One of the most frequently used measures of IU is the Intolerance of Uncertainty Scale(IUS). The original French version of the IUS was developed to assess emotional, cognitive, and behavioral reactions to uncertainty(Freeston et al., 1994, p.791). Despite excellent internal consistency and construct validity, factor analytic studies have yielded inconsistent factor structure of the IUS. Studies using the original 27-item version have reported two-, four-, and five-factor structure(Carleton et al., 2007; Sexton & Dugas, 2009; Buhr & Dugas, 2002; Freeston et al., 1994), many of which consisted of factors that were difficult to interpret and contained items that were cross-loaded on different factors. Maack, Deacon, and Abramowitz (2005) argued that several items on the IUS does not satisfy face validity concerns and appear to measure possible consequences of IU.

Carleton et al. (2007) developed a short version of the IUS(IUS-12) as a response to the inconsistent findings of several factor analyses using different languages(Buhr & Dugas, 2002; Freeston et al., 1994). The results of CFA using two large undergraduate samples found that different factor structures of the IUS-27 did not provide an adequate fit and yielded a 12-item questionnaire(IUS-12). The IUS-12

demonstrated a stable two factor structure: 1) Inhibitory Anxiety-uncertainty leading to inability to act and 2)Prospective Anxiety-unacceptability and avoidance of uncertainty. The total score of IUS-12 showed excellent psychometric properties and the correlation between the total score of the IUS-12 and original IUS was very high(r=.96).

The aim of Study I was to develop the Korean version of a short version of the Intolerance of Uncertainty Scale(IUS-12) by establishing its psychometric properties. In order to validate the Korean version of IUS-12, the measure's reliability, validity and the factor structure were analyzed. First, Exploratory Factor Analysis(EFA) was conducted using MPlus Version 7. to examine a factor structure of the IUS-12, then Confirmatory Factor Analysis(CFA) was performed using MPlus Version 7. to confirm a factor structure extracted from EFA. Alongside the factor analyses, the reliability was examined by yielding a Cronbach's alpha.

In addition, construct and convergent validity was judged by correlations between the IUS-12 and the measures related to worry, GAD, other symptoms associated with anxiety disorders such as anxiety sensitivity, experiential avoidance, fear of negative evaluation, and depression. Together with previous studies suggesting IU as transdiagnostic risk factor in development and maintenance of emotional disorders, all the measures were expected to have a significant correlations with IUS-12.

Method

Participants

Participants(N= 206) were recruited from various introductory psychology classes at Seoul National University and administered online survey. To form the cohort used for analysis, five participants under age of 18 were excluded from the analyses. The sample included 138 men(M age= 20.14 , SD= 1.75) and 63 women(M age= 19.68, SD= 1.162), ranging in age from 18 to 25 years(M age= 20, SD= 1.60). Institutional review board(IRB) approval was obtained from Seoul National University prior to conducting the study(IRB No. E1706/002-002). Participants were recruited through the psychology research pools, and each participant received course extra credit. All participants were provided informed consent prior to study enrollment.

Procedures

With permission from the author(Nick Carleton), the original English version of IUS-12 was translated into Korean. A bilingual clinical psychologist reviewed the translation in order to identify discrepancies indicative of ambiguous wording or other problems. Then, two bilingual people blind to the original questionnaire back translated the questionnaire into English. Finally, the author reviewed two versions of back translation and verified the validity of the Korean version of IUS-12.

Measures

The Korean version of a shortened Intolerance of Uncertainty Scale(K-IUS-12). The IUS-12 is a short-form of the original 27-item Intolerance of Uncertainty Scale(Freeston et al., 1994) that measures reactions to uncertainty, ambiguous situations, and the unknown future. Items are scored on a 5-point Likert scale ranging from 1(not at all characteristic of me) to 5(entirely characteristic of me). The IUS-12 had a strong correlation with the original scale, r = .94 to .96(Carleton et al., 2007; Khawaja & Yu, 2010). It consists of two factors: prospective intolerance of uncertainty(7 items; e.g., "I can't stand being taken by surprise") and inhibitory intolerance of uncertainty(5 items; e.g., "When it's time to act, uncertainty paralyses me"), both with identically high internal consistencies, α= .85 (Carleton et al., 2007). The IUS-12 showed excellent internal consistency and convergent validity with the original IUS(Carleton et al., 2007; Carleton, Sharpe, et al.,2007). The psychometric properties of the IUS-12 have all been replicated and manifested in clinical and nonclinical samples(Khawaja & Yu, 2010; McEvoy & Mahoney, 2011).

The State-Trait Anxiety Inventory-form X(STAI-X). While the term 'anxiety' is widely used to describe an emotional state characterized by subjective feelings of apprehension, tension, nervousness and worry, and by activation or arousal of the autonomic nervous system, it is also used to describe relatively stable individual differences in anxiety as a personality trait. The STAI was developed

to measure these different constructs. Form X of the STAI (Spielberger, Gorsuch, & Lushene, 1970) contains 20 state anxiety items and 20 trait anxiety items. In this study, 20 trait anxiety items of the Korean version of STAI-X were administered to participants. The trait anxiety items are rated on a 4-point frequency scale (from "almost never" to "almost always"). Participants are asked to indicate how they generally feel. Scoring is reversed for anxiety-absent items (e.g., "I feel calm"). The range of scores is 20 - 80.

A short form of the Center for Epidemiological Studies Depression(S-CES-D). The epidemiology of depressive symptomatology in the general (i.e., non-psychiatric) population. The current study used 11-item Korean version of the CES-D scale used in the Korea Welfare Panel Study. This scale has been shown to have four factors: 1) depressive affect 2) lack of positive affect 3) somatic complaints 4) interpersonal problems. Item 2 and 7 were reversely scored. The measurement invariance testing of a short form of CES-D was confirmed(Hoe, Park, & Bae, 2015).

The Psychiatric Diagnostic Screening Questionnaire(PDSQ). The Psychiatric Diagnostic Screening Questionnaire (PDSQ; Zimmerman & Mattia, 2001) is a 126-item questionnaire that was designed to screen for 13 of the DSM-IV disorders that have been found to be most prevalent in large epidemiological studies. PDSQ items assess current symptoms, but the scale cannot be used to

assess clinically significant diagnoses because it does not assess for functional impairment. The subscale used in this study was symptoms of generalized anxiety disorder(GAD; 10 items). The Korean version of PDSQ(Kwak et al., 2012) was administered to participants.

The Penn State Worry Questionnaire(PSWQ). PSWQ is a 16-item self-report measure of worry severity in daily life developed by Meyer et al. (1990). PSWQ displayed strong psychometric properties in clinical samples (Brown et al. 1992). Responses are rated on a 5-point Likert scale, ranging from "not at all typical for me" to "very typical of me". Items 1, 3, 8, 10, and 11 are reverse-scored items before computing the total score. High internal consistency and good test - retest reliability have been reported (Meyer et al., 1990). The Korean version of PSWQ was administered(Lim, Kim, Lee & Kwon, 2008), which demonstrated sound psychometric properties.

The Acceptance and Action Questionnaire - 2(AAQ-2). AAQ-2 is a 10-item, self-report measure of experiential avoidance developed by Bond et al.(2011). Higher scores reflect lower experiential avoidance. All items are rated on a 7-point Likert-type scale ranging from 1 (never true) to 7 (always true).The AAQ - 2 has been found to have adequate reliability and validity (Bond et al., 2011). Heo, Choi, Jin(2009) translated and validated items of AAQ-2 in Korean, which demonstrated satisfactory psychometric properties.

The Anxiety sensitivity index-revised(ASI-R). The ASI-R (Taylor & Cox, 1998a) has 36 items including 10 from the original 16-item ASI. Respondents are asked to indicate their level of agreement with each item on a scale ranging from very little(coded as 0) to very much(coded as 4). Total scores range from 0 to 144. Principal components factor analysis of ASI-R data yielded a four-factor solution that accounted for 60% of the variance as well as a single higher-order factor(Taylor & Cox, 1998a). The four factors were (1) fear of respiratory symptoms; (2) fear of publicly observable anxiety reactions; (3) fear of cardiovascular symptoms; and (4) fear of cognitive dyscontrol. The Korean version of ASI-R was administered to participants(Kim et al., 2004).

A Brief version of the Fear of Negative Evaluation scale (BFNE). BFNE(Leary, 1983) is a brief version of the original thirty-item Fear of Negative Evaluation Scale. The Korean version of the BFNE(Choi., 1997) was used to assess apprehension or distress as a result of others' negative evaluations and to measure the degree of social anxiety. The scale comprises 12 items and uses a 5-point Likert scale. The scale showed high internal consistency(α=.90).

Results

The results of the survey conducted to two hundred and one participants were yielded using SPSS version 20.0 and MPlus Version 7. The mean, standard deviation, skewness, and kurtosis of the K-IUS-12 were summarized in Table 1.

Table 1. *Summary of Descriptive Statistics of the K-IUS-12(N=201)*

item	*M*	*SD*	skewness	kurtosis
1	2.99	.85	-.43	.39
2	3.09	.88	-.18	.32
3	2.68	.92	.09	-.16
4	3.21	.96	-.24	-.11
5	3.06	.87	-.13	-.24
6	2.03	.82	.59	.55
7	2.34	.86	.23	-.34
8	3.38	.98	-.27	.04
9	2.40	.85	.22	-.04
10	2.40	.88	.09	-.49
11	2.29	.93	.27	-.24
12	2.22	.89	.42	-.27

Note. *M*= mean; *SD*= standard deviation; K-IUS-12= Korean version of a short form of the Intolerance of Uncertainty Scale, items are presented in Table 2 and in Appendix 2.

Explanatory Factor Analysis

In order to examine the factor structure of IUS-12, exploratory factor analysis was performed by using MPlus Version 7. In line

with the original factor-analytic work on the IUS-12, maximum likelihood analysis followed by geomin rotation was employed to explore item aggregation. Geomin is an oblique type of rotation that gives the correlations between the factors in the output. Kass and Tinsley(1979) suggested 5 to 10 participants per each item and Comrey and Lee(1992) stated that a sample size of 200 is fair and 300 is good. Before EFA, the Kaiser - Mayer - Olkin(KMO) test and Bartlett's test of sphericity were performed to justify the suitability of data for a factor analysis. The value of the KMO measure of sampling adequacy was .91, which is very high for a factor analysis. The Bartlett's test of sphericity produced χ^2= 2402.55, p< .001, indicating that correlations between items were sufficiently large and thus suitable for EFA. EFA extracted a two-factor solution based on the criterion of an eigenvalue >1. The model fits of a two-factor model were good(RMSEA= .07, CFI= .95, TLI= .93). Table 2 summarized the items and geomin-rotated factor loadings. All items showed an adequate factor loadings(>.30).

A total of 12 items loaded significantly on one of the two factors. As presented in Table 2, seven items(1,2,3,4,5,8,9) for factor 1 represent prospective intolerance of uncertainty, while five items(6,7,10,11,12) for factor 2 represent inhibitory intolerance of uncertainty.

Table 2. *Geomin-rotated factor loadings of the K-IUS-12(N=201)*

	item	Factor 1	Factor 2
Prospective IU			
1	Unforseen events upset me greatly.	**.64**	.03
2	It frustrates me not having all the information I need.	**.85**	-.19
3	Uncertainty keeps me from living a full life.	**.71**	.00
4	One should always look ahead so as to avoid surprises.	**.47**	.05
5	A small unforeseen event can spoil everything, even with the best of planning.	**.56**	.01
8	I always want to know what the future has in store for me.	**.42**	.17
9	I can't stand being taken by surprise.	**.47**	.36
Inhibitory IU			
6	When it's time to act, uncertainty paralyses me.	.23	**.62**
7	When I am uncertain I can't function very well.	.18	**.73**
10	The smallest doubt can stop me from acting.	.34	**.40**
11	I should be able to organize everything in advance.	-.01	**.71**
12	I must get away from all uncertain situations.	-.01	**.74**

Confirmatory Factor Analysis

Following EFA, confirmatory factor analysis(CFA) was conducted to verify the proposed two-factor structure of the K-IUS-12 by using MPlus Version 7. Because item 3 loaded on Inhibitory IU(I-IU) and item 11 loaded on Prospective IU(P-IU) in the present study, model fit of the proposed model was compared with that of the

original IUS-12, which was supported by both non-clinical (Carleton et al., 2007) and mixed clinical samples(Carleton et al., 2012; McEvoy & Mahoney, 2011). Furthermore, the present study compared the model fits of one and two factor solutions of the IUS-12. Since chi-square test of overall model fit is sensitive to sample size, three model fit indices were used to determine the adequacy of the model. They were Root Mean Square test of the overall model fit indices Error of Approximation(RMSEA), Comparative Fit Index(CFI), and Tucker-Lewis Index(TLI). Generally, if RMSEA is lower than .08, the model is considered to be appropriate(MacCallum, Browne & Sugawara, 1996). Values of CFI> .90 and TLI> .90 indicate proper fit(Hu & Bentler, 1999).

As presented in Table 3, the fit indices suggested that the optimal fit was obtained for a two-factor model proposed by EFA(RMSEA= .08; CFI= .92; TLI= .90). All other models had a poorer fit to the data.

Table 3. *CFA fit indices for the K-IUS-12(N=498)*

Model	RMSEA	CFI	TLI
1 factor	.11	.88	.86
2 factor	.10	.90	.87
Korean 2 factor	.08	.92	.90

Note. RMSEA= root mean square error of approximation; CFI= comparative fit index; TLI= Tucker-Lewis Index

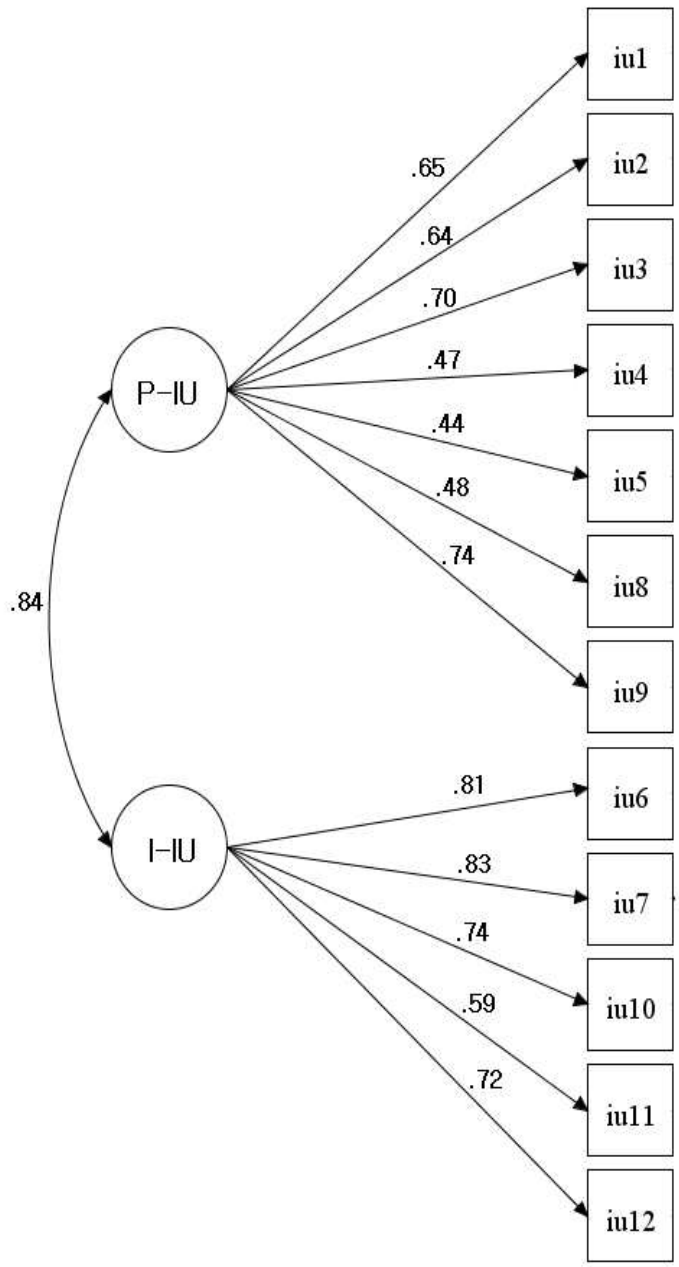


Figure 2. Factor Structure of the K-IUS-12(12 items)

Table 4. *Correlation of each K-IUS-12 item with the sum of the other items and internal consistency if the item is deleted(N=201)*

	item	corrected item-total correlation	α if item deleted
1	Unforseen events upset me greatly.	.57	.88
2	It frustrates me not having all the information I need.	.57	.88
3	Uncertainty keeps me from living a full life.	.60	.88
4	One should always look ahead so as to avoid surprises.	.48	.89
5	A small unforeseen event can spoil everything, even with the best of planning.	.50	.88
6	When it's time to act, uncertainty paralyses me.	.68	.88
7	When I am uncertain I can't function very well.	.73	.87
8	I always want to know what the future has in store for me.	.54	.88
9	I can't stand being taken by surprise.	.60	.87
10	The smallest doubt can't stop me from acting.	.63	.88
11	I should be able to organize everything in advance.	.57	.88
12	I must get away from all uncertain situations.	.59	.88

Reliability and item-level analysis of the K-IUS-12

The corrected item - total correlations(i.e., the correlation of each item with the sum of the remaining items) were presented in Table 2. Assessment of the internal consistency of the K-IUS-12 yielded an

overall Cronbach's α of .89 for the entire scale(α= .82 for prospective IU subscale, and α= .85 for inhibitory IU subscale). Based on the criterion of .30 as an acceptable corrected item - total correlation (Nunnally & Bernstein, 1994), all twelve items performed adequately (range= .48 - .73). The two subscales were correlated with each other at a high level, r= 0.67, p< 0.001.

Table 5. *Mean, Standard Deviation, Cronbach's Alpha of the* measures *(N=201)*

	M	*SD*	*α*
K-IUS-12	32.10	7.18	.89
PSWQ	47.72	12.40	.94
PDSQ-GAD	3.13	2.73	.82
S-CES-D	6.00	4.94	.84
STAI-X	41.75	10.38	.92
AAQ-2	41.44	7.64	.86
ASI-R	20.73	14.93	.92
BFNE	24.30	9.16	.92

Note. K-IUS-12= Korean version of a short form of the intolerance of uncertainty scale; PSWQ= Penn State Worry Questionnaire; PDSQ-GAD= The Psychiatric Diagnostic Screening Questionnaire-generalized anxiety disorder subscale; S-CES-D= A short form of the Center for Epidemiological Studies Depression Scale; STAI-X= The State-Trait Anxiety Inventory - Form X; AAQ-2= The Acceptance and Action Questionnaire - 2; ASI-R= Anxiety Sensitivity Index - Revised; BFNE= Brief Fear of Negative Evaluation scale

Association of K-IUS-12 with the related psychological features

In order to assess construct validity of K-IUS-12 by examining the relationship with the related psychological constructs, descriptive statistics of the measures were calculated and the correlation analysis was conducted. Mean, standard deviation, and Cronbach's alpha of all measures were presented in Table 4 and the results of the correlation analysis were shown in Table 5.

A correlation between the IUS-12 and all the other measures was statistically significant(Table 6). The K-IUS-12 had a strong positive correlation with worry(r= .62, p< .01), trait-anxiety (r= .54, p< .01), and generalized anxiety symptoms(r= .50, p< .01). In addition, K-IUS-12 was positively associated with depression(r= .36, p< .01), anxiety sensitivity(r= .35, p< .01), fear of negative evaluation(r= .46, p< .01), and showed a moderate negative correlation with acceptance(r= -.40, p< .01). Furthermore, P-IU and I-IU subscales showed significant correlations with all other measures.

Table 6. *Pearson's bivariate correlations(N=201)*

	1	2	3	4	5	6	7	8	9
1. K-IUS-12	-								
2. Prospective IU	.93**	-							
3. Inhibitory IU	.89**	.67**	-						
4. PSWQ	.62**	.55**	.59**	-					
5. PDSQ-GAD	.50**	.47**	.45**	.67**	-				
6. S-CES-D	.36**	.29**	.39**	.59**	.61**	-			
7. STAI-X	.54**	.49**	.50**	.81**	.67**	.73**	-		
8. AAQ-2	-.40**	-.32**	-.42**	-.65**	-.63**	-.64**	-.79**	-	
9. ASI-R	.35**	.38**	.25**	.50**	.49**	.43**	-.54**	-.51**	-
10. BFNE	.46**	.43**	.41**	.60**	.47**	-.42**	.67**	-.56**	.50**

Note. K-IUS-12= Korean version of a short form of the intolerance of uncertainty scale; PSWQ= PennState Worry Questionnaire; PDSQ-GAD= The Psychiatric Diagnostic Screening Questionnaire -generalized anxiety disorder subscale; S-CES-D= A short form of Center for Epidemiologic Studies Depression Scale; STAI-X= The State-Trait Anxiety Inventory - Form X; AAQ-2= The Acceptance and Action Questionnaire - 2; ASI-R= anxiety Sensitivity Index-Revised; BFNE= Brief Fear of Negative Evaluation scale

** $p<0.01$.

Discussion

In Study I, a short form of the Intolerance of Uncertainty Scale (IUS-12; Carleton et al, 2007) was translated into Korean and validated by verifying its reliability, validity, and the factor structure. After obtaining a permission to use IUS-12 for developing a Korean version of IUS-12 from the author, items were translated under the supervision of professional clinical psychologist. Using translated items and the other related scales, data was collected and analyzed to examine psychometric properties of K-IUS-12.

Prior to conducting factor analyses, characteristics of each item were examined. A normal distribution was assumed given that skewness and kurtosis of all items were close to zero. The correlation of each item with the sum of the remaining items were between .47 and .71, indicating that all items performed appropriately.

Exploratory factor analysis was performed to assess the factor structure of K-IUS-12. In accordance with the original IUS-12(Carleton et al., 2007), a two factor solution was found to be appropriate and items loaded on each factor were nearly identical to original IUS-12 except for two items; item 3 loaded onto Prospective IU and item 11 loaded onto Inhibitory IU in the current study. These discrepancies in the contents of dimensions of K-IUS-12 may be attributable to translation process or cultural differences in interpretation. For example, item 11 “I should be able to organize everything in advance.” may be interpreted as an inaction in

anticipation of uncertainty in Korean. Furthermore, item 10 was retained even though it was cross-loaded on both factors given that it was loaded onto inhibitory IU in the original IUS-12 and the content of the item explicitly illustrates an inaction in the face of uncertainty.

Confirmatory factor analysis using data from independent sample was conducted. The present study compared unitary, a two-factor structure of original IUS-12, and a two-factor structure from EFA and the best fitting model, and the only one with adequate cutoff values of overall fit indices, was a two-factor structure extracted from EFA. As suggested by Helson et al. (2013), the two factors were named 1) Prospective IU(also referred as a desire for predictability; item 1,2,3,4,5,8,9) and 2) Inhibitory IU(also referred as uncertainty paralysis; item 6,7,10,11,12), with the former relating to anxiety in expectation of future uncertain events manifested in excessive approach behaviors and the latter indicating a sense of feeling paralyzed or inability to function against uncertainty. In line with previous research(Carleton, Sharpe and Asmundson, 2007; McEvoy & Mahoney, 2011), a two-factor model was apparently superior to unitary model, thus verifying the separability of the subscales.

The psychometric properties of the K-IUS-12 such as internal reliability and construct validity were good. An internal reliability of the scale using a Cronbach's alpha was excellent(α= .89), as it was for each of the two independent factors called Prospective IU(α= .82)

and Inhibitory IU(α= .85), supporting the use of the two subscales individually. These findings were similar to the results of Carleton et al. (2007), who examined the English version, and suggested that IUS-12 could be a valid scale to measure intolerance of uncertainty in Korea.

As Carleton(2007) suggested to examine the association between IU and other anxiety-related constructs, a number of constructs such as anxiety sensitivity, fear of negative evaluation, experiential avoidance, as well as trait-anxiety and depression, were included in the correlation analysis. The results of the present study were in line with the previous findings(Helsen et al., 2013) in that K-IUS-12 had a stronger correlation with worry(r= .62, p< .01) compared to trait-anxiety(r= .54, p< .01) and GAD(r= .50, p< .01), indicating that IU could be a more crucial factor for worry than for trait anxiety, and that it could even be a cognitive risk factor for the development of pathological worry. K-IUS-12 showed a moderate positive correlation with anxiety sensitivity(r= .35, p< .01) and fear of negative evaluation(r= .46, p< .01) that were known to be a vulnerability factor for development and maintenance of panic disorder and social anxiety disorder, respectively. The K-IUS-12 was also positively related to depression(r= .36, p< .01), while AAQ-2 was negatively correlated with the K-IUS-12(r= -.40, p< .01), indicating that difficulty tolerating uncertainty is associated with higher levels of depression and experiential avoidance. These findings are support of previous research by suggesting that difficulty tolerating

uncertainty could be a transdiagnostic construct that contributes to the development and maintenance of a broad range of emotional disorders characterized by negative affect(Boswell et al., 2013).

In conclusion, the present study has shown that the Korean version of IUS-12(K-IUS-12) is a valid and suitable measurement for assessing intolerance of uncertainty in an undergraduate sample. These findings are consistent with the findings of Carleton et al. (2007), who developed the English version of the IUS-12. In addition, the use of the two individual subscales, might contribute to better understanding of the unique association of IU with symptoms of various mental disorders.

Study II. The Relationship between Intolerance of Uncertainty and Problematic Eating Behaviors: An Examination of Potential Mediating Pathways

In spite of theoretical association and early evidence suggesting that IU may be an urgent risk factor in development and maintenance of EDs, research examining the role of IU in the field of EDs is limited (Sternheim et al., 2011). A preliminary research investigating the association between IU and EDs reported that patients with AN and BN had higher levels of IU compared to healthy control group(Frank et al., 2012). Furthermore, individuals with problematic eating attitudes appeared to be more intolerant of uncertainty than those with normal eating attitudes(Konstantellou & Reynolds, 2010). Individuals with problematic eating behaviors appeared to extremely control their eating, shape, and weight in order to gain certainty and perceived of control in life and to manage negative affect elicited by IU.

The 'triple vulnerability model' of emotional disorders proposed that three vulnerabilities contribute to the development of emotional disorders in general(Barlow, 2000): (1) general biological vulnerability (i.e., dimensions of temperament); (2) general psychological vulnerability (i.e., low perceived control over life); (3) disorder-specific psychological vulnerability (e.g., overvaluation of shape and weight in ED). If IU is a common psychological mechanism underlying symptoms of emotional disorders and EDs, it is crucial to investigate

intervening mechanisms that carry the influence of IU to problematic eating behaviors.

Thus, the aim of Study 2 was to examine unique association of IU and problematic eating behaviors and to investigate potential mediating role of overvaluation of shape and weight and food craving in the relationship between IU and problematic eating behaviors. In the current study, problematic eating behaviors refer to dietary restraint and binge eating that do not satisfy a psychiatric diagnosis of EDs.

The following hypotheses were proposed:

Hypothesis 1. IU would positively related to perfectionism, negative urgency, overvaluation of shape and weight, food craving, dietary restraint, binge eating, anxiety, and depression.

Hypothesis 2. IU would uniquely predict dietary restraint beyond and above gender and perfectionism.

Hypothesis 3. IU would have indirect effect on dietary restraint via overvaluation of shape and weight.

Hypothesis 4. IU would predict unique variance in binge eating beyond predicted by gender and negative urgency.

Hypothesis 5. IU would have indirect effect on binge eating via food craving.

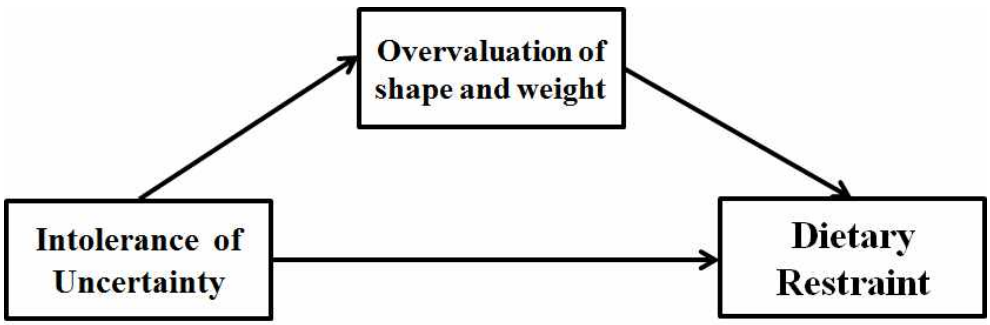


Figure 3. Hypothesized model showing the direct relationship between intolerance of uncertainty and dietary restraint, and the indirect relationship via overvaluation of shape and weight.

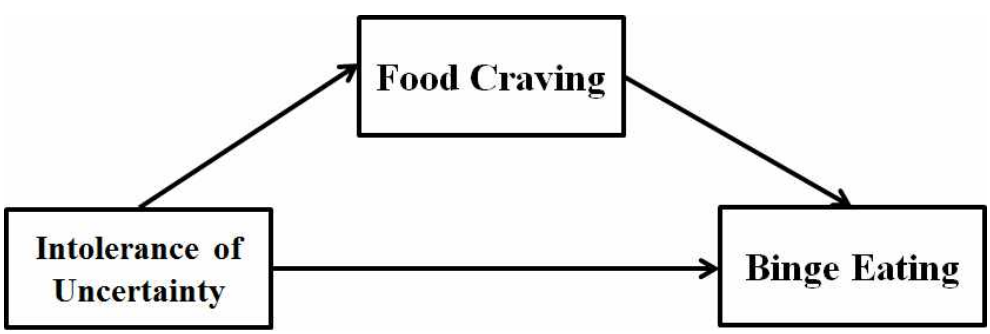


Figure 4. Hypothesized model showing the direct relationship between intolerance of uncertainty and binge eating, and the indirect relationship via food craving.

Method

Participants

Participants(*N*= 502) recruited from introductory psychology classes at Seoul National University and online community page were administered online survey. Four participants under age of 18 were excluded from analyses. The sample included 452 undergraduate students and 46 graduate students. 239 were men(*M* age= 21.36, *SD*= 2.69) and 259 women(*M* age= 20.96, *SD*= 2.85), ranging in age from 18 to 34 years(*M* age= 21.15 *SD*= 2.78). The mean BMI was 21.57 kg/m2(*SD*= 2.81). Institutional review board(IRB) approval was obtained from Seoul National University prior to conducting the study(IRB No. E1706/003-006). Participants who were recruited through the psychology research pools and online community received course extra credit and a small reward, respectively. All participants provided informed consent before administering the questionnaire.

Measures

A short form of the Intolerance of Uncertainty Scale(K-IUS-12). The IUS-12 is the short-form of the original 27-item Intolerance of Uncertainty Scale (Freeston et al., 1994) that measures reactions to uncertainty, ambiguous situations, and the

unknown future. Items are scored on a 5-point Likert scale ranging from 1 (not at all characteristic of me) to 5 (entirely characteristic of me). The IUS-12 has a strong correlation with the original scale, *r*= .94 to .96 (Carleton, Norton, et al., 2007; Khawaja & Yu, 2010). It consists of two factors: prospective IU (7 items; e.g., "I can't stand being taken by surprise") and inhibitory IU (5 items; e.g., "When it's time to act, uncertainty paralyses me"), both with identically high internal consistencies(Carleton et al., 2007). The IUS-12 has excellent internal consistency and convergent validity with the original (Carleton et al., 2007). The psychometric properties of the IUS-12 have all been replicated and manifested in clinical and nonclinical samples(Carleton et al., 2007; Khawaja & Yu, 2010; McEvoy & Mahoney,2011).

The State-Trait Anxiety Inventory- form X(STAI-X). While the term 'anxiety' is widely used to describe an emotional state characterized by subjective feelings of apprehension, tension, nervousness and worry, and by activation or arousal of the autonomic nervous system(Spielberger, 1972), it is also used to describe relatively stable individual differences in anxiety as a personality trait (Spielberger, 1972). The STAI was developed to measure these different constructs. Form X of the STAI (Spielberger et al., 1970) contains 20 state anxiety items and 20 trait anxiety items. In this study, 20 trait anxiety items of the Korean version were administered to participants. The trait anxiety items were rated on a 4-point

frequency scale(from “almost never” to “almost always”). Respondents were asked to indicate how they generally feel. Scoring was reversed for anxiety-absent items(e.g., “I feel calm”). The range of scores is 20 - 80.

A short form of the Central Epidemiological Studies - Depression(S-CES-D). CES-D was primarily designed for use in studies of the epidemiology of depressive symptomatology in the general (i.e., non-psychiatric) population. Developed for survey research by Radloff (1977), original CES-D The current study used 11-item Korean version of the CES-D scale used in the Korea Welfare Panel Study. This scale has been shown to have four factors: 1) depressive affect 2) lack of positive affect 3) somatic complaints 4) interpersonal problems. Item 2 and 7 were reversely scored. The measurement invariance testing of a short form of CES-D was confirmed(Hur, Park, & Bae, 2015).

The Multidimensional Perfectionism Scale(MPS). The MPS is a 45 - item measure of perfectionism consisting of three theoretically distinct scales developed by Hewitt & Flett, 1991. In this study, the Korean version of MPS(Han, 1993), which demonstrated sound psychometric properties, was used. The Self - Oriented Perfectionism (MPS - Self) scale measures for high achievement expectations and striving for perfection. The Other - Oriented Perfectionism (MPS - Other) scale measures expectations of perfection from others. Lastly,

the Socially Prescribed Perfectionism (MPS - Social) scale measures concern over meeting the expectations of others. Respondents were asked to rate their agreement to statements based on a 7 - point Likert - type scale ranging from 1 (disagree) to 7 (agree). Higher scores on each of the scales reflect greater levels of perfectionism.

The UPPS-P Negative Urgency scale. UPPS-P Negative Urgency scale is a 12-item Likert-type scale to measure one's tendency to act rashly in response to intense negative mood states (Lynam, Smith, Cyders, Fischer, & Whiteside, 2007) The scale has consistently proven internally consistent and unidimensional (Cyders et al., 2007; Smith et al., 2007; Whiteside & Lynam, 2001). The Korean version of UPPS-P Negative Urgency scale (Lim & Lee, 2011) was used, which demonstrated good internal consistency(α = .85).

Weight and Shape Based Self Value Test(WSSV). Overvaluation of shape and weight was measured using two specific items developed by Lee and Oh(2005): "Over the past 4 weeks, has your shape influenced how you feel about (judge, think, evaluate) yourself as a person?" and "Over the past 4 weeks has your weight influenced how you feel about (judge, think, evaluate) yourself as a person?" The two overvaluation items are rated on a 5-point likert scale. The scale demonstrated good psychometric properties.

General-Food Craving Questionnaire-Trait(G-FCQ-T). Food cravings were measured by the Korean version of the General Food Craving Questionnaire Trait (G-FCQ-T; Noh et al., 2008). The GFCQ-T is a reliable and valid 21-item self-report measure of a general 'desire for food' or 'desire to eat' (Cronbach's a = .88) (Noh, 2007) consisting of the following four subscales (1) preoccupation with food (i.e., obsessively thinking about food and eating), (2) loss of control (i.e., experiencing difficulties in regulating eating behaviour when exposed to food cues), (3) positive outcome expectancy (i.e., believing eating to be positively reinforcing), and (4) emotional craving (i.e., the tendency to crave food when negative emotions are present). Participants were asked to rate their agreement to statements based on a 6 - point scale ranging from 1 ('Never' or 'Not Applicable') to 6 ('Always').

The Eating Attitudes Test(EAT-26). The Eating Attitudes Test (EAT-26) includes 26 items rated on a 6-point scale and recoded on a 4-point scale (0 = never, rarely, sometimes; 1 = often; 2 = usually; 3 = always) (Garner & Garfinkel, 1979). The Korean version of EAT-26(K-EAT-26; Lee et al, 1998) was used in the present study. This measure does not yield a clinical diagnosis, but is useful in assessing eating disorder risk such that scores greater than or equal to 20 suggest an individual is within range of problematic eating attitudes and behaviors (Garner, Olmsted, Bohr, & Garfinkel, 1982). The EAT-26 consists of 3 factors: Dieting, Bulimia and Food

Preoccupation, and Oral Control (Garner et al., 1982). The current study included dieting and oral control subscales(20 items) in order to assess dietary restraint.

Bulimia Test－Revised(BULIT-R). BULIT-R(Thelen, Farmer, Wonderlich, & Smith, 1991) assesses level of bulimic symptomatology. The scale consists of 28 items measuring binge eating and 8 items measuring weight-control behaviors. The current study included 28 items to measure level of binge eating. All items are presented in a 5-point likert scale and higher scores indicates severity of binge eating problems. Total scores are obtained by summing across the 28 items, ranging from 28 to 140. The Korean version of BULIT-R(Ryu et al., 1999) was used in the present study, which demonstrated good internal consistency(α=.83-.93).

Body Mass Idex(BMI). BMI is calculated based on the formula kg/m2 and is a measure of the relative weight and height of a person(World Health Organization, 2015).

Results

The results of the survey conducted to 498 participants were yielded using SPSS version 20.0. The mean score, standard deviation score, and Cronbach's Alpha of all measures were summarized in Table 7.

Table 7. *Mean, Standard Deviation, and Cronbach's Alpha of the measures(N=498)*

	Total		Male		Female		*t*	*α*
	M	*SD*	*M*	*SD*	*M*	*SD*		
K-IUS-12	32.76	6.98	32.15	7.38	33.31	6.56	-1.85	.88
EAT-26	7.18	6.52	4.85	4.41	9.34	7.37	-4.48**	.80
BULIT-R	54.93	18.21	50.00	14.99	59.46	19.70	-9.46**	.94
STAI-X	42.38	10.41	40.09	9.70	44.50	10.61	-6.21**	.92
S-CES-D	7.21	6.13	6.07	5.59	8.26	6.42	-3.26**	.89
MPS	178.94	27.22	178.41	26.00	179.43	28.34	-5.82	.91
UPPS-P	28.39	6.85	27.08	7.12	29.61	6.35	-3.72**	.88
WSSW	7.53	2.37	6.91	2.24	8.10	2.27	-1.19**	.85
G-FCQ-T	69.24	20.16	61.15	17.78	76.70	19.36	-15.54**	.94

Note. K-IUS 12= The Korean version of a short form of the Intolerance of Uncertainty Scale; EAT-26= The Eating Attitude Test; BULIT-R= Bulimia Test-Revised; STAI-X= State-Trait Anxiety Inventory - form X; S-CES-D= a short form of the Central Epidemiological Studies-Depression; MPS= Multidimensional Perfectionism Scale; UPPS-P= negative urgency scale; WSSV= Weight and Shape based Self-Value Test; G-FCQ-T= General Food Craving Questionnaire-Trait; $^{**}p<.01$

Gender differences

In the measures of EAT-26, BULIT-R, STAI-X, CES-D, UPPS-P, WSSV, and G-FCQ-T, female group scored significantly higher than male group. Female students showed higher levels of dietary restraint (EAT-26), $t(496) = -4.48$, $p < .01$, and binge eating(BULIT-R), $t(478.72) = -9.46$, $p < .01$, than male students. Also, female students scored significantly higher on food craving(G-FCQ-T), $t(496) = -15.54$, $p < .01$, and overvaluation of shape and weight(WSSW), $t(496) = -1.19$, $p < .01$. In terms of emotional variables, female students showed higher levels of negative urgency, $t(496) = -3.72$, $p < .01$, anxiety, $t(496) = -6.21$, $p < .01$, and depression, $t(496) = -3.26$, $p < .01$, than male students.

The association between IU, problematic eating behaviors, and ED-related constructs

Table 8 presented Pearson's bivariate correlation coefficients between variables. The K-IUS-12 scores had significant positive correlations with all the other variables including dietary restraint($r = .20$, $p < .01$), binge eating($r = .25$, $p < .01$), anxiety($r = .50$, $p < .01$), depression($r = .38$, $p < .01$, food craving($r = .27$, $p < .01$), overvaluation of shape and weight($r = .22$, $p < .01$), perfectionism($r = .44$, $p < .01$), and negative urgency($r = .33$, $p < .01$). Furthermore, two subscales of the K-IUS-12, prospective IU and inhibitory IU, were positively associated with all the other measures at a significant level($p < .01$).

Table 8. *Correlations of the measures(N=498)*

	1	2	3	4	5	6	7	8	9
1. K-IUS-12	-								
2. P-IU	.93**	-							
3. I-IU	.90**	.68**	-						
4. EAT-26	.20**	.19**	.17**	-					
5. BULIT-R	.25**	.21**	.25**	.59**	-				
6. STAI-X	.50**	.48**	.45**	.31**	.48**	-			
7. S-CES-D	.38**	.34**	.36**	.33**	.51**	.78**	-		
8. MPS	.44**	.39**	.41**	.16**	.23**	.30**	.24**	-	
9. UPPS-P	.33**	.33**	.27**	.23**	.46**	.53**	.38**	.19**	-
10. WSSW	.22**	.21**	.20**	.49**	.53**	.36**	.37**	.19**	.32**
11. G-FCQ-T	.27**	.26**	.23**	.39**	.68**	.45**	.38**	.18**	.56**

Note. K-IUS 12=The Korean version of a short form of the Intolerance of Uncertainty Scale; P-IU=Prospective IU subscale; I-IU=Inhibitory IU subscale; EAT-26=The Eating Attitude Test; BULIT-R=Bulimia Test-Revised; STAI-X=State-Trait Anxiety Inventory - form X; S-CES-D=a short form of the Central Epidemiological Studies-Depression; MPS=Multidimensional Perfectionism Scale; UPPS-P=negative urgency scale; WSSV=Weight and Shape based Self-Value Test; G-FCQ-T=General Food Craving Questionnaire-Trait; $^{**}p<.01$

The unique contribution of IU to dietary restraint

A series of hierarchical linear regressions was conducted to determine whether addition of intolerance of uncertainty accounted for an additional variance in restraint, after controlling for gender and perfectionism. Preliminary analyses indicated no threats or violations of normality, multicollinearity, or homoscedasticity. Gender was included as controlled variable because the mean level of dietary restraint significantly differed by gender as shown in Table 7.

Table 9. *Summary of hierarchical linear regressions for gender, perfectionism, and IU predicting dietary restraint(N=498)*

step	variable	β	t	R^2	ΔR^2	F model
1	constant		.42	.12	.12***	66.43***
	gender	.34	8.15			
2	constant		-3.04	.14	.02***	40.48***
	gender	.34	8.18			
	perfectionism	.15	3.60			
3	constant		-3.63	.15	.01**	29.91***
	gender	.33	7.98			
	perfectionism	.09	2.04			
	IU	.13	2.77			

Note. IU= intolerance of uncertainty

**$p<.01$. ***$p<.001$

After step 1, with gender in the equation, 12% of variance of dietary restraint was explained, ΔR^2= .12, F(1, 496)= 66.43, p< .001). After step 2, with the addition of perfectionism to the equation, there was a significant increase in the total amount of variance explained, ΔR^2= .02, F(1, 495)= 12.92, p< .001 and the overall model was statistically significant, F(2, 495)= 40.48, p< .001. After step 3, with the addition of IU, there was a small but significant increase in the total amount of variance explained, ΔR^2= .01, F(1, 494)= 7.68, p< .01, and the overall model was also statistically significant, F(3, 494)= 29.91, p< .001.

Table 10. *Summary of hierarchical linear regressions for gender, perfectionism, P-IU, and I-IU predicting dietary restraint(N=498)*

step	variable	β	t	R^2	ΔR^2	F model
	constant		-3.69***			
	gender	.33	7.97***			
3	perfectionism	.10	2.07*	.16	.01*	7.68***
	P-IU	.11	1.96			
	I-IU	.03	.43			

Note. P-IU: prospective intolerance of uncertainty subscale; I-IU: inhibitory intolerance of uncertainty subscale

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

In order to determine whether subscales of the K-IUS-12 were uniquely associated with dietary restraint scores an additional hierarchical linear regression was conducted using SPSS version 20.0 as shown in Table 10. Since Step 1 and 2 are identical to the

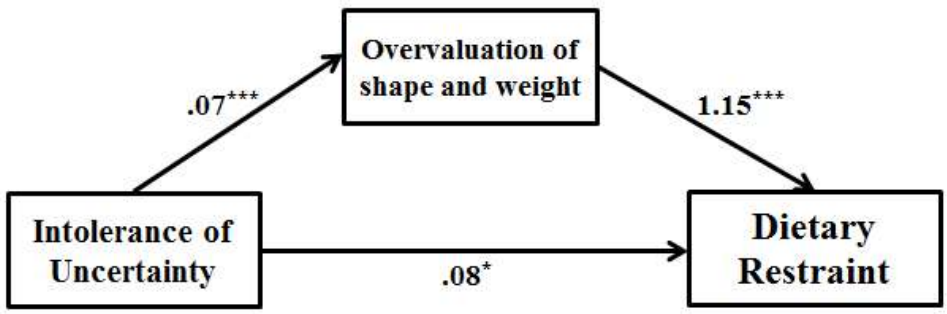
previous hierarchical linear regression, the results were omitted from Table 10. Both Prospective IU and Inhibitory IU subscales were entered in Step 3, and neither prospective IU nor inhibitory IU accounted for unique variance in dietary restraint.

Indirect effect of IU on dietary restraint via overvaluation of shape and weight

To verify whether IU has indirect effect on dietary restraint through overvaluation of shape and weight, data was analyzed using the PROCESS macro for SPSS, version 2.16.1(Hayes, 2012). The PROCESS program calculates the total effect of the independent variable on the dependent variables, the direct effect of the independent variable on the dependent variable, the total indirect effect via mediating variable along with 95% confidence intervals using at least 1000 bootstrapping re-samples. Confidence intervals that do not contain zero suggests significant indirect effect(mediation). This study requested for 10,000 bias corrected bootstrap samples in PROCESS. The PROCESS macro is increasingly preferred over the methods of Baron and Kenny (1986), the latter of which do not directly test the significance of the indirect effect of the independent variable on the dependent variable via the mediator.

Both the direct relationship between IU and dietary restraint, and the indirect effect of IU on dietary restraint via overvaluation of shape and weight were presented in Figure 5. Gender was included

as a covariate. As presented in Table 11, both direct effect(β= .08, SE= .4, t= 2.21, p< .05) and indirect effect(β= .08, SE= .02, 95% CI= .04-.12) of IU on dietary restraint were statistically significant. Sobel test also confirmed indirect effect of IU on dietary restraint(z= 4.31, p<.001).



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

Figure 5. The effects of intolerance of uncertainty on dietary restraint via overvaluation of shape and weight

Table 11. *Linear model of predictors of dietary restraint(N=498)*

	β	*Boot SE*	*BootCI*	*t*
intolerance of uncertainty → overvaluation of shape and weight	.07	.01	.04-.10	4.77***
overvaluation of shape and weight → restraint	1.15	.11	.93-1.37	10.33***
direct effect	.08	.40	.01-.15	2.21*
indirect effect	.08	.02	.04-.12	

Note. *β*= unstandardized coefficient; *Boot SE*= bootstrap standard error; *BootCI*= bootstrap confidence interval
*p<.05. ***p<.001

The unique contribution of IU to binge eating

Hierarchical regression analyses were conducted to determine whether addition of IU accounted for a unique variance in binge eating over and beyond gender and negative urgency. Gender was included as controlled variable as same as previous analyses. After Step 1, with gender in the equation, 7% of the total variance of binge eating was explained, $\Delta R^2 = .07$, $F(1, 496) = 35.84$, $p < .001$. After step 2, with the addition of negative urgency to the equation, negative urgency explained additional 18% of the total variance of binge eating, $\Delta R^2 = .18$, $F(1, 495) = 115.06$, $p < .001$, and the overall model was also statistically significant, $F(2, 495) = 79.58$, $p < .001$. After step 3, with the addition of IU, there was a small but statistically significant increase in the total variance accounted for binge eating, $\Delta R^2 = .01$, $F(1, 494) = 6.38$, $p < .05$, and the overall model was also statistically significant, $F(3, 494) = 55.76$, $p < .001$.

In order to determine whether subscales of the K-IUS-12 were uniquely associated with binge eating scores a series of additional hierarchical linear regressions was conducted. Gender was entered in Step 1, negative urgency was entered in Step 2, and both subscales(prospective IU and inhibitory IU) of the K-IUS-12 were entered in Step 3. The output for Step 3(Step 1 and 2 are identical to the previous hierarchical linear regression) was presented in Table 13 and inhibitory IU subscale explained unique variance in binge eating above and beyond gender and negative urgency, $t = 2.96$, $p < .01$, $\Delta R^2 =$

.02, $F(2, 493) = 5.54$, $p < .01$, and the overall model was also statistically significant, $F(4, 493) = 43.29$, $p < .001$.

Table 12. *Summary of hierarchical linear regressions for gender, negative urgency, and IU predicting binge eating(N=498)*

step	variable	β	t	R^2	ΔR^2	F model
1	constant		16.02***	.07	.07***	35.85***
	gender	.26	5.98***			
2	constant		3.68***	.24	.18***	79.58***
	gender	.18	4.52***			
	NU	.43	10.73***			
3	constant		1.54	.25	.01*	55.76***
	gender	.18	4.48***			
	NU	.39	9.40***			
	IU	.10	2.53*			

Note. NU= negative urgency; IU= intolerance of uncertainty
*$p<.05$. ***$p<.001$.

Table 13. *Summary of hierarchical linear regressions for gender, negative urgency, P-IU and I- IU predicting binge eating(N=498)*

step	variable	β	t	R^2	ΔR^2	F model
3	constant		1.54	.26	.02**	43.29***
	gender	.18	4.48***			
	NU	.40	9.70***			
	P-IU	-.04	-.79			
	I-IU	.16	2.96**			

Note. P-IU= prospective intolerance of uncertainty subscale; I-IU= inhibitory intolerance of uncertainty subscale; NU=negative urgency
**$p<.01$. ***$p<.001$.

Indirect effect of IU on binge eating via food craving

To verify whether IU has indirect effect on binge eating through food craving, data was analyzed using the PROCESS macro for SPSS, version 2.16.1(Hayes, 2012). Both the direct relationship between IU and binge eating, and the indirect effects of IU on binge eating mediated through food craving were presented in Figure 6. Gender was included as a covariate.

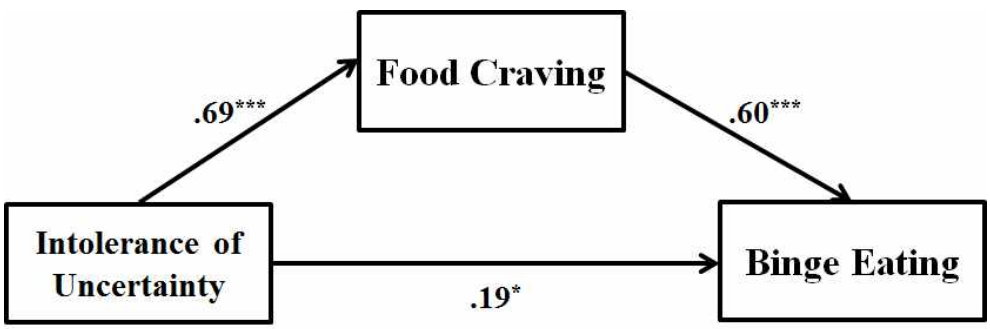


Figure 6. The effects of intolerance of uncertainty on binge eating via food craving

Both direct effect(β= .18, SE= .9, t= 2.08, p< .05) and indirect effect(β= .41, SE= .08, 95% CI= .27-.57) of IU on binge eating were statistically significant as shown in Table 14. Sobel test also confirmed indirect effect of IU on binge eating(z= 5.61, p< .001).

Table 14. Linear model of predictors of binge eating(N=498)

	β	*Boot SE*	*Boot CI*	*t*
intolerance of uncertainty → food craving	.69	.12	.46-.91	5.91***
food craving → binge eating	.60	.03	.53-.66	17.97***
direct effect	.19	.09	.01-.36	2.08*
indirect effect	.41	.08	.27-.57	

Note. *β*= unstandardized coefficient; *BootSE*= bootstrap standard error; *BootCI*= bootstrap confidence interval
*$p<.05$. ***$p<.001$.

Additional analyses: The effects of intolerance of uncertainty on problematic eating behaviors: An examination of gender differences

In order to determine whether indirect effects of IU on problematic eating behaviors(dietary restraint and binge eating) differ by gender, additional analyses were performed. As shown in Table 15 and Table 16, there was a significant indirect effect of IU on dietary restraint mediated through overvaluation of shape and weight regardless of gender. Similarly, indirect effect of IU on binge eating via food craving was statistically significant regardless of gender. The only gender difference was that direct effect of IU on binge eating was significant only for female. These results are shown in Table 17 and Table 18.

Table 15. Linear model of predictors of dietary restraint - Female(N=259)

	β	*Boot SE*	*Boot CI*	*t*
intolerance of uncertainty → overvaluation of shape and weight	.08	.02	.04-.13	4.14***
overvaluation of shape and weight → dietary restraint	1.51	.18	1.15-1.86	8.35***
direct effect	.12	.07	-.02-.25	1.74
indirect effect	.13	.03	.07-.20	

Note. *β*= unstandardized coefficient; *Boot SE*= bootstrap standard error; *BootCI*= bootstrap confidence interval
***p<.001

Table 16. Linear model of predictors of dietary restraint - Male(N=238)

	β	*Boot SE*	*Boot CI*	*t*
intolerance of uncertainty → overvaluation of shape and weight	.05	.02	.01-.09	2.74**
overvaluation of shape and weight → dietary restraint	.75	.12	.52-.99	6.28***
direct effect	.04	.04	-.03-.11	1.17
indirect effect	.04	.02	.01-.08	

Note. *β*= unstandardized coefficient; *Boot SE*= bootstrap standard error; *BootCI*= bootstrap confidence interval
**p<.01. ***p<.001.

Table 17. Linear model of predictors of binge eating - Female(N=259)

	β	*Boot SE*	*BootCI*	*t*
intolerance of uncertainty → food craving	.79	.18	.44-1.15	4.38***
food craving → binge eating	.64	.06	.52-.76	10.63***
direct effect	.44	.17	.10-.78	2.57*
indirect effect	.51	.13	.27-.76	

Note. *β*= unstandardized coefficient; *Boot SE*= bootstrap standard error; *BootCI*= bootstrap confidence interval
*$p<.05$. ***$p<.001$.

Table 18. Linear model of predictors of binge eating - Male(N=238)

	β	*Boot SE*	*BootCI*	*t*
intolerance of uncertainty → food craving	.59	.15	.29-.89	3.92***
food craving → binge eating	.53	.04	.45-.62	12.15***
direct effect	-.03	.10	-.23-.18	-.25
indirect effect	.32	.09	.16-.50	

Note. *β*= unstandardized coefficient; *Boot SE*= bootstrap standard error; *BootCI*= bootstrap confidence interval
***$p<.001$.

Discussion

In Study II, the role of IU in problematic eating behaviors(dietary restraint and binge eating) was investigated using the K-IUS-12 validated in Study I. Consistent with previous studies, the K-IUS-12 was positively related to dietary restraint(Konstantellou & Reynolds, 2010), overvaluation of shape and weight(Renjan et al., 2016), perfectionism(Boelen & Reijintjes, 2009), negative urgency(Pawluk & Koerner, 2013), anxiety(Carleton et al., 2007), and depression(Mahoney & McEvoy, 2012). Furthermore, IU showed a positive correlation with binge eating and food craving. An important finding was that IU explained unique variance in dietary restraint and binge eating measures, even after controlling for gender and established eating-related constructs such as perfectionism (Fairburn et al., 2003) and negative urgency(Anestis et al., 2009), providing support that IU could be a robust predictor of disordered eating behaviors. Furthermore, inhibitory IU subscale of the K-IUS-12 was uniquely associated with binge eating. Given that inhibitory IU subscale has been characterized by freezing in the face of uncertainty(Kesby et al., 2017), inhibitory IU might be more specific risk factor for engaging in binge eating by means of dampening the unbearable experience of uncertainty. Interestingly, neither subscales of the IUS-12 uniquely explained dietary restraint, indicating no significant independent relationship to dietary restraint.

To clarify the psychological process underlying the relationship

between IU and problematic eating behaviors, indirect effect of IU on dietary restraint via overvaluation of shape and body and indirect effect of IU on binge eating through food craving were examined separately. Both direct and indirect effects of IU on dietary restraint and binge eating were statistically significant. These results indicate that IU may serve as a direct or indirect vulnerability factor for problematic eating behaviors. Overconcerns about shape and weight may be an attempt to restore certainty and perceived control over stressful life events, which in turn results in dietary restraint(Frank et al., 2012; Renjan et al., 2016). Individuals with difficulty tolerating uncertainty may engage in binge eating given the need to cope with uncertainty and negative affect. In this process, food craving in response to IU may represent experiential avoidance as means of changing or avoiding unwanted negative emotions, thoughts, or bodily sensations(Hayes et al., 2004). All indirect effects of IU on dietary restraint and binge eating were statistically significant regardless of gender.

In sum, all of five hypotheses were supported. In accordance with previous research, these findings corroborate the notion of IU as a common vulnerability across various emotional symptoms and eating disorder symptomatology(Roblek & Frank, 2002; Renjan et al., 2016). It is for future research to determine whether incorporating IU as an additional target in standard ED treatments can enhance treatment outcome as previous studies reported clinical benefits of targeting IU in GAD treatment protocols(Dugas & Ladouceur, 2000a, 2000b).

General Discussion

The aim of the current study was to validate the Korean version of a short-form of the Intolerance of Uncertainty Scale(IUS-12) and to investigate the association of intolerance of uncertainty(IU) to problematic eating behaviors(dietary restraint and binge eating) in an undergraduate sample.

In study I, the results of EFA yielded a two-factor structure for the K-IUS-12, with item loadings that were nearly identical to those for the original English version of the IUS-12; item 3 loaded on Prospective IU, while item 11 loaded on Inhibitory IU. These differences in item loadings might attributed to cultural differences in interpreting statements. The results of CFA confirmed the factor structure from EFA. Furthermore, when compared model fits of the original two-factor structure of the original IUS-12 with a two-factor structure extracted from EFA, only the latter satisfied conventional cutoffs for adequate model fit. As previous studies suggested, two factors were labeled as prospective IU and inhibitory IU(Helsen et al., 2013). K-IUS-12 demonstrated a good internal consistency reliability and construct validity, indicating the utility of K-IUS-12. Accordingly, these findings provided support for the application of the psychometrically sound K-IUS-12 in future research in regard to intolerance of uncertainty. Future research could investigate whether the current findings generalize to a community and clinical sample.

In Study II, the role of IU in problematic eating behaviors was

examined by investigating the relationship between IU, problematic eating behaviors, and ED-related constructs. In accordance with previous studies, total K-IUS-12 scores, as well as subscales, were positively correlated with trait-anxiety, depression, perfectionism, negative urgency, overvaluation of shape and weight, food craving, dietary restraint, and binge eating, corroborating the transdiagnostic value of IU across symptomatology of emotional disorders and EDs. In addition, disordered eating behaviors and related constructs were positively correlated with anxiety and depression, indicating the role of negative affect in problematic eating behaviors.

In order to assess a unique contribution of IU to problematic eating behaviors, hierarchical linear regression analyses were performed. The results showed that IU explained a small but significant amount(1.3%) of total variance in dietary restraint above and beyond the variance explained by gender and perfectionism. With regard to binge eating, IU uniquely accounted for an additional 1% of the total variance in binge eating, after controlling for gender and negative urgency. Furthermore, inhibitory IU was uniquely associated with binge eating and explained additional 2% of the total variance in binge eating above and beyond gender and negative urgency. These results suggest that IU may be one of the urgent risk factors for the development and maintenance of problematic eating behaviors.

The second purpose of the Study II was to evaluate indirect effects model within which IU served as a risk factor for overvaluation of shape and weight and food craving, as well as problematic eating

behaviors. The significant associations between IU, negative affect, overvaluation of shape and weight, and problematic eating behaviors found in this study are in line with previous studies reporting significantly heightened levels of IU in patients with EDs compared to healthy control group(Frank et al., 2012; Renjan et al., 2016). Furthermore, IU had indirect effect on dietary restraint via overvaluation of shape and body. An excessive concern about eating, shape, and weight manifested in individuals with EDs may serve as an effort to gain certainty and control over painful life events. Alternately, it is plausible that IU may play a role in formation of rigid beliefs about eating, weight and shape in an attempt to attain predictability and control, which then lead to excessive dietary restraint.

There is preliminary evidence that IU may be associated with binge eating, as one study found that patients with BN reported an elevated level of IU compared with healthy control group(Frank et al., 2012). However, research examining the role of IU in binge eating is scarce, and no study has investigated how IU could lead to binge eating. In this study, IU had both direct effect and indirect effects on binge eating through food craving. Individuals experiencing increased levels of stress and negative affect caused by difficulty tolerating uncertainty may engage in binge eating as a maladaptive strategy to manage uncertainty and negative affect. In addition, it is plausible that IU at least in part motivates food craving, which, in turn, leads to binge eating.

These findings add to a growing literature suggesting that IU may be a robust risk factor for problematic eating behaviors and EDs. Understanding the role of IU in problematic eating behaviors may have significant clinical benefit by providing a novel intervention addressing potential underlying mechanism in cognitive, behavioral, and affective symptoms of EDs. Several studies have proposed clinical interventions that target ED symptoms via IU by learning better coping strategies and developing the ability to tolerate uncertainty, encompassing cognitive-behavioral approaches and acceptance and commitment therapy and mindfulness exercise(Hildebrandt et al., 2012; Stewart, 2011).

There are several limitations of this study. The first limitation is that the current study was conducted on a narrow sample of college students at Seoul National University that is not necessarily representative of the overall student population. Given that our sample yielded a relatively mild levels of dietary restraint and binge eating, it is crucial to examine whether these associations between IU and problematic eating behaviors hold true in a community and treatment-seeking sample, including clinical populations diagnosed with EDs. Second, the cross-sectional design of the current study precludes directional or causal conclusions about the influence of IU on problematic eating behaviors. Longitudinal research investigating the relationship between IU and problematic eating behaviors is required to elucidate temporal and causal relationship of IU and problematic eating habits. Future studies employing experimental

manipulations of uncertainty could help clarify the association between IU and problematic eating behaviors. A third limitation was the reliance of self-report measures to examine the relationship between IU and problematic eating behaviors. Thus, studies using various research methods(i.e., experimental methodology) are required for a better understanding of the role of IU in the development and maintenance of problematic eating behaviors. Finally, additional research is required to understand where IU may fit in existing conceptual models of EDs. The present study examined IU in association with overvaluation of shape and weight and food craving. However, IU may be the consequence of other ED-related processes not explored in the current study, such as a cognitive rigidity(Roberts et al., 2007) and distress intolerance(Corstorphine et al., 2007).

Despite these limitations, this study extends the literature by demonstrating that the IUS-12 is a valid and reliable measure in an undergraduate sample and by investigating the association between IU, dietary restraint, binge eating, and other ED-related constructs in both male and female undergraduates. These findings highlight the possibility that IU could be contributing to the development and maintenance of problematic eating behaviors and subsequent EDs, possibly through overvaluation of shape and weight and food craving.

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APPENDIX

Appendix 1.

The shortened Intolerance of Uncertainty Scale (IUS-12)

■ You will find below a series of statements which describe how people may react to **the uncertainties of life**. Please check the number that best corresponds to how much you agree with each statement.

Not at all characteristic of me	A little characteristic of me	somewhat characteristic of me	Very characteristic of me	Entirely characteristic of me
1	2	3	4	5

	item	check the number				
1.	Unforseen events upset me greatly.	1	2	3	4	5
2.	It frustrates me not having all the information I need.	1	2	3	4	5
3.	Uncertainty keeps me from living a full life	1	2	3	4	5
4.	One should always look ahead so as to avoid surprises.	1	2	3	4	5
5.	A small unforeseen event can spoil everything, even with the best of planning.	1	2	3	4	5
6.	When it's time to act, uncertainty paralyses me.	1	2	3	4	5
7.	When I am uncertain I can't function very well.	1	2	3	4	5
8.	I always want to know what the future has in store for me.	1	2	3	4	5
9.	I can't stand being taken by surprise.	1	2	3	4	5
10.	The smallest doubt can stop me from acting.	1	2	3	4	5
11.	I should be able to organize everything in advance.	1	2	3	4	5
12.	I must get away from all uncertain situations.	1	2	3	4	5

Appendix 2. A Korean version of the shortened Intolerance of Uncertainty Scale (K-IUS-12)

■ 앞으로 어떠한 일이 일어날지 모르는 **'미래의 불확실함'**에 대한 문항입니다. 본인의 생각, 태도, 느낌, 감정의 정도를 가장 잘 나타내주고 있는 정도에 0표해 주십시오.

전혀 그렇지 않다	약간 그렇다	웬만큼 그렇다	꽤 그렇다	매우 그렇다
1	2	3	4	5

	문 항	해당하는 정도				
1.	예상하지 못한 갑작스러운 일은 나를 매우 불편하게 한다	1	2	3	4	5
2.	내가 필요로 하는 모든 정보를 가지지 못하는 것은 나를 짜증나게 한다.	1	2	3	4	5
3.	불확실함은 내가 충실한 삶을 살지 못하게 한다.	1	2	3	4	5
4.	갑작스러운 일들을 피하기 위해서는 항상 미래에 대해 생각해야 한다.	1	2	3	4	5
5.	최선의 계획을 세우더라도, 예측하지 못한 작은 일들이 모든 것을 망칠 수 있다.	1	2	3	4	5
6.	무언가를 실행으로 옮겨야 할 때, 불확실한 것이 있으면 나는 아무것도 할 수 없다.	1	2	3	4	5
7.	나는 불확실하면 일을 제대로 수행할 수 없다.	1	2	3	4	5
8.	나는 항상 미래에 나에게 어떤 일이 일어날지 알고 싶다.	1	2	3	4	5
9.	나는 갑작스러운 일이 벌어지는 것을 견딜 수 없다.	1	2	3	4	5
10.	아주 사소한 모호함도 내가 무언가를 실행하기 어렵게 만들 수 있다.	1	2	3	4	5
11.	나는 사전에 모든 것을 계획할 수 있어야만 한다.	1	2	3	4	5
12.	나는 모든 불확실한 상황들을 피해야만 한다.	1	2	3	4	5

Appendix 3.
The Penn State Worry Questionnaire(PSWQ)

■ 다음 문항들은 걱정에 대한 일련의 진술들로 이루어져 있습니다. 자신에게 적합한 정도에 체크해 주십시오.

전혀 그렇지 않다	약간 그렇다	웬만큼 그렇다	꽤 그렇다	매우 그렇다
1	2	3	4	5

문 항		해당하는 정도				
1.	나는 일을 다 끝낼 만큼 시간이 충분치 않아도 걱정하지 않는다.	1	2	3	4	5
2.	걱정이 나를 누른다.	1	2	3	4	5
3.	나는 그리 걱정하는 사람이 아니다.	1	2	3	4	5
4.	나는 여러 가지 일에 대해서 걱정한다.	1	2	3	4	5
5.	나는 걱정하지 않아도 된다는 것을 알면서도 어쩔 수가 없다.	1	2	3	4	5
6.	뭔가에 압박을 받으면, 상당히 걱정하게 된다.	1	2	3	4	5
7.	나는 늘 뭔가에 대해 걱정하고 있다.	1	2	3	4	5
8.	걱정스러운 생각을 떨쳐버리는 것이 어렵지 않다.	1	2	3	4	5
9.	무슨 일 하나를 끝내면 곧바로, 해야 할 다른 일에 대한 걱정이 시작된다.	1	2	3	4	5
10.	나는 어떤 일에 대해서도 전혀 걱정하지 않는다.	1	2	3	4	5
11.	걱정거리에 대해 내가 할 수 있는 일이 없다면 더 이상 걱정하지 않는다.	1	2	3	4	5
12.	나는 지금까지 늘 걱정이 많은 사람이었다.	1	2	3	4	5
13.	얼마 전에도 어떤 것에 대해서 걱정하고 있었다.	1	2	3	4	5
14.	일단 걱정이 시작되면 멈출 수가 없다.	1	2	3	4	5
15.	나는 내내 걱정하고 지낸다.	1	2	3	4	5
16.	나는 어떤 일을 다 끝마칠 때까지는 그 일에 대해 계속 걱정한다.	1	2	3	4	5

Appendix 4.
A short form of the Center for Epidemiological Studies Depression(S-CES-D)

■ 오늘을 포함하여 **지난 1주일**동안 자주 느낀 정도에 체크해주십시오.

극히 드물다 (1주 중 1일 이하)	가끔 있었다 (1주 중 1~2일간)	자주 있었다 (1주 중 3~4일간)	거의 대부분 그랬다 (1주 중 5일 이상)
0	1	2	3

나는 지난 1주일 동안…		해당하는 정도			
1.	먹고 싶지 않고 식욕이 없다.	0	1	2	3
2.	비교적 잘 지냈다.	0	1	2	3
3.	상당히 우울했다.	0	1	2	3
4.	모든 일이 힘들게 느껴졌다.	0	1	2	3
5.	잠을 설쳤다. (잠을 잘 이루지 못했다.)	0	1	2	3
6.	세상에 홀로 있는 듯한 외로움을 느꼈다.	0	1	2	3
7.	큰 불만 없이 생활했다.	0	1	2	3
8.	사람들이 나에게 차갑게 대하는 것 같았다.	0	1	2	3
9.	마음이 슬펐다.	0	1	2	3
10.	사람들이 나를 싫어하는 것 같았다.	0	1	2	3
11.	도무지 뭘 해 나갈 엄두가 나지 않았다.	0	1	2	3

Appendix 5.

Psychiatric Diagnostic Screening Questionnaire (PDSQ)-Generalized Anxiety Disorder(GAD) subscale

■ 오늘을 포함하여 **지난 6개월 동안** 당신의 행동이나 느낌, 생각과 같으면 '예', 다르면 '아니오'에 체크해주십시오.

	문 항	예	아니오
1.	거의 매일, 신경이 과민했습니까?	예	아니오
2.	자신이나 자신과 가까운 누군가에게 나쁜 일이 생길까봐 걱정을 많이 했습니까?	예	아니오
3.	다른 사람들은 걱정할 필요가 없다고 하는 일에 대해 걱정을 했습니까?	예	아니오
4.	거의 매일, 일상생활 속에서 수많은 일에 대해 걱정하거나 불안해했습니까?	예	아니오
5.	걱정하느라 안절부절못하거나 초조함을 자주 느꼈습니까?	예	아니오
6.	어떤 일을 걱정하느라 잠을 이루지 못한 적이 있습니까?	예	아니오
7.	불안감이나 스트레스로 인해 근육이 긴장되는 것을 종종 느꼈습니까?	예	아니오
8.	걱정에 사로잡혀 있어 무엇에 집중하는 데 종종 어려움을 겪었습니까?	예	아니오
9.	걱정하거나 스트레스를 받아서 종종 초조하거나 짜증이 났습니까?	예	아니오
10.	거의 매일, 걱정을 통제하거나 멈추기가 어려웠습니까?	예	아니오

Appendix 6.

Acceptance-Action-Questionnaire-2(AAQ-2)

■ 평소 일상에서 **일반적으로 느끼는 바**를 가장 잘 나타내주는 정도에 표시해 주십시오.

전혀 그렇지 않다	거의 그렇지 않다	별로 그렇지 않다	가끔 그렇다	조금 그렇다	거의 그렇다	매우 그렇다
1	2	3	4	5	6	7

	문 항	해당하는 정도						
1.	고통스러운 경험과 기억으로 인해 나는 내가 가치 있게 여기는 삶을 살기가 어렵다.	1	2	3	4	5	6	7
2.	나는 내 감정을 느끼는 것이 두렵다.	1	2	3	4	5	6	7
3.	나는 내 걱정과 느낌을 통제하지 못하는 것에 대해 염려한다.	1	2	3	4	5	6	7
4.	내 고통스러운 기억들은 내가 만족스러운 삶을 살지 못하게 하고 있다.	1	2	3	4	5	6	7
5.	나는 내 삶을 잘 관리하고 있다.	1	2	3	4	5	6	7
6.	감정은 내 일상생활에서 문제를 일으킨다.	1	2	3	4	5	6	7
7.	대부분의 사람들은 나보다 자신의 삶을 잘 꾸려나가고 있는 것 같다.	1	2	3	4	5	6	7
8.	걱정은 내가 성공하는 데 걸림돌이 된다.	1	2	3	4	5	6	7

Appendix 7.

State-Trait Anxiety Inventory : STAI-X-2

■ 다음 문장들은 사람들이 자신을 표현하는데 사용되는 것들입니다. 각 문장을 잘 읽으시고 당신이 **평소에 일반적으로 느끼는 바**를 나타내는 문항에 표시하여 주십시오. 여기에 옳고 그름은 없습니다. 어느 한 문장에서 너무 오래 머무르지 마시고, 당신이 일반적으로 어떻게 느끼는지를 가장 잘 나타내고 있다고 생각되는 문항에 표시해주십시오.

거의 그렇지 않다	가끔 그렇다	자주 그렇다	거의 언제나 그렇다
1	2	3	4

	문 항	해당하는 정도			
1.	나는 기분이 좋다.	1	2	3	4
2.	나는 쉽게 피로해진다.	1	2	3	4
3.	나는 울고 싶은 심정이다.	1	2	3	4
4.	나도 다른 사람들처럼 행복했으면 한다.	1	2	3	4
5.	나는 마음을 빨리 정하지 못해서 실패를 한다.	1	2	3	4
6.	나는 마음이 놓인다.	1	2	3	4
7.	나는 침착하고 차분하다.	1	2	3	4
8.	나는 너무 많은 여러 문제가 밀어닥쳐서 극복할 수 없을 것 같다.	1	2	3	4
9.	나는 하찮은 일에 너무 걱정을 한다.	1	2	3	4
10.	나는 행복하다.	1	2	3	4

11.	나는 무슨 일이건 힘들게 생각한다.	1	2	3	4
12.	나는 자신감이 부족하다.	1	2	3	4
13.	나는 마음이 든든하다.	1	2	3	4
14.	나는 위기나 어려움을 피하려고 애쓴다.	1	2	3	4
15.	나는 울적하다.	1	2	3	4
16.	나는 만족스럽다.	1	2	3	4
17.	사소한 생각이 나를 괴롭힌다.	1	2	3	4
18.	나는 실망을 지나치게 예민하게 받아들이기 때문에 머리 속에서 지워버릴 수가 없다.	1	2	3	4
19.	나는 착실한 사람이다.	1	2	3	4
20.	나는 요즈음의 걱정이나 관심거리를 생각하면 긴장되거나 어찌할 바를 모른다.	1	2	3	4

Appendix 8.

A Brief Fear of Negative Evaluation Scale(BFNE)

■ 다음 문항들은 **사회적 상황에서 경험할 수 있는 생각과 감정**에 대한 것입니다. 각 문항들을 주의 깊게 읽으시고, 자신에게 해당되는 정도에 체크해 주십시오.

전혀 그렇지 않다	약간 그렇다	웬만큼 그렇다	꽤 그렇다	매우 그렇다
1	2	3	4	5

	문 항	해당하는 정도				
1.	사람들이 나를 어떻게 생각하는가가 중요하지 않다는 것을 알면서도 걱정된다.	1	2	3	4	5
2.	사람들이 나에 대해 좋지 않은 인상을 갖고 있다는 것을 알아도 개의치 않는다.	1	2	3	4	5
3.	사람들이 나의 결점을 알아 차릴까봐 자주 걱정된다.	1	2	3	4	5
4.	다른 사람에게 내가 어떤 인상을 주는가에 대해 거의 염려하지 않는다.	1	2	3	4	5
5.	사람들이 나를 인정해 주지 않을 것 같아 걱정된다.	1	2	3	4	5
6.	사람들이 나의 결점을 찾아 낼 것 같아 걱정된다.	1	2	3	4	5
7.	나에 대한 다른 사람의 평가에 신경 쓰지 않는다.	1	2	3	4	5
8.	누군가와 얘기할 때 그가 나에 대해 어떤 생각을 하고 있을지 염려된다.	1	2	3	4	5
9.	내가 어떤 인상을 주는지에 대해 대게 걱정된다.	1	2	3	4	5
10.	누군가 나를 평가하는 것을 알아도 이로 인해 영향 받지 않는다.	1	2	3	4	5
11.	다른 사람이 나를 어떻게 생각하는지에 대해 때때로 지나치게 염려한다.	1	2	3	4	5
12.	말을 실수하거나 일을 잘 못할까봐 걱정된다.	1	2	3	4	5

Appendix 9.

Anxiety Sensitivity Index - Revised(ASI-R)

■ 아래의 문항들은 일반적으로 사람들이 **"불안을 느낄 때 드는 생각들"**을 적은 것입니다. **자신이 불안을 느낄 때, 그와 같은 생각이 얼마나 드는지**를 체크해 주십시오.

전혀 그렇지 않다	약간 그렇다	어느 정도 그렇다	많이 그렇다	매우 많이 그렇다
1	2	3	4	5

	문 항	해당하는 정도				
1.	충분히 숨을 들이켰다고 느끼지 않을 때, 질식할까 두려워진다.	0	1	2	3	4
2.	신체적 감각들 중에는 나를 무섭게 하는 것들이 있다.	0	1	2	3	4
3.	숨이 차서 겁이 난다.	0	1	2	3	4
4.	가슴이 조여오면, 제대로 숨을 쉴 수 없을 것 같아 두려워진다.	0	1	2	3	4
5.	기절할 것 같아 겁이 난다.	0	1	2	3	4
6.	목구멍이 조여오면, 질식해서 죽을 것 같아 두렵다.	0	1	2	3	4
7.	심장이 빨리 뛰어서 겁이 난다.	0	1	2	3	4
8.	호흡이 불규칙해지면, 나쁜 일이 일어날 것 같아 두렵다.	0	1	2	3	4
9.	떨려서 겁이 난다.	0	1	2	3	4
10.	음식이 잘 삼켜지지 않으면, 질식할 것 같아 두렵다.	0	1	2	3	4

11.	주변이 이상하거나 비현실적으로 느껴지면 무척 놀라게 된다.	0	1	2	3	4
12.	내 몸이 이상하거나 뭔가 다르다고 느껴질 때 두렵다.	0	1	2	3	4
13.	남에게 불안하게 보이지 않아야 한다.	0	1	2	3	4
14.	공공장소에서 토하는 것은 끔찍한 일이라 생각한다.	0	1	2	3	4
15.	공공장소에서 기절하는 것은 끔찍한 일이라 생각한다.	0	1	2	3	4
16.	다른 사람들이 내가 불안하다는 것을 알아차릴까 걱정된다.	0	1	2	3	4
17.	사람들 앞에서 내가 떨고 있으면, 사람들이 나를 어떻게 생각할까 두렵다.	0	1	2	3	4
18.	사회적 상황에서 땀을 흘리면, 사람들이 나를 좋지 않게 생각할까 두렵다.	0	1	2	3	4
19.	사람들 앞에서 얼굴이 붉어지면 두렵다.	0	1	2	3	4
20.	위통이 심하게 느껴지면, 암일까봐 두렵다.	0	1	2	3	4
21.	머리가 욱신거리면, 뇌졸중(중풍)일까봐 걱정이 된다.	0	1	2	3	4
22.	심장이 빨리 뛰는 것을 느끼면, 심장마비가 올까봐 걱정이 든다.	0	1	2	3	4
23.	얼굴에 감각이 없어지면 뇌졸중(중풍)일까봐 걱정이 된다.	0	1	2	3	4
24.	가슴에 통증이 느껴지면, 심장마비가 올까봐 걱정이 된다.	0	1	2	3	4
25.	어지러워지면, 혹시 뇌에 무슨 이상이 있을까봐 걱정이 된다.	0	1	2	3	4

26.	뱃속이 불편할 때, 심각한 병에 걸리지 않았나 걱정이 된다.	0	1	2	3	4
27.	심장박동이 불규칙하다고 느껴지면, 나에게 뭔가 심각한 이상이 있을까봐 걱정이 된다.	0	1	2	3	4
28.	설사를 하게 되면, 나에게 뭔가 이상이 있을까봐 걱정이 된다.	0	1	2	3	4
29.	속이 메스꺼워 겁이 난다.	0	1	2	3	4
30.	손이 따끔거리거나 저리는 느낌이 오면, 두려워진다.	0	1	2	3	4
31.	정신이 몽롱해지면, 정신병이 있을까봐 걱정이 된다.	0	1	2	3	4
32.	여러 생각이 물밀 듯 떠오르면, 혹시 내가 미쳐가는 건 아닌지 걱정이 된다.	0	1	2	3	4
33.	명료하게 생각할 수 없을 때, 나에게 무슨 문제가 있을까봐 걱정이 된다.	0	1	2	3	4
34.	일을 집중할 수 없게 되면, 미쳐버리지 않을까 걱정이 된다.	0	1	2	3	4
35.	일에 집중할 수 없어서 겁이 난다.	0	1	2	3	4
36.	머리가 텅 빈 것 같을 때, 내가 뭔가 크게 잘못된 것은 아닌지 걱정이 된다.	0	1	2	3	4

Appendix 10.

UPPS-P Negative Urgency scale

■ 아래 문항들은 사람들이 행동하고 생각하는 방식을 기술한 것입니다. 각각의 문항에 대하여 귀하가 **얼마나 동의/반대하는지**를 표시해 주십시오. 모든 문항에 빠짐없이 답변해 주시기 바랍니다.

매우 동의 약간 동의 약간 반대 매우 반대

1 …… 2 …… 3 …… 4

	문 항	해당하는 정도			
1.	나는 충동을 통제하는 데에 어려움이 있다.	1	2	3	4
2.	나의 욕구(음식, 담배 등에 대한)에 저항하는 것이 어렵다.	1	2	3	4
3.	나중에 빠져나오기를 원하는 일에 종종 말려들곤 한다.	1	2	3	4
4.	기분이 나쁠 때면 당장 기분을 좋아지게 하기 위해서 나중에 후회할 일을 종종 하게 된다.	1	2	3	4
5.	기분이 나쁠 때면 가끔씩, 내가 하고 있는 일이 내 기분을 더 나쁘게 하더라도 그 일을 멈추기가 어렵다.	1	2	3	4
6.	속이 상할 때, 나는 종종 생각 없이 행동하곤 한다.	1	2	3	4
7.	거부당했다고 느끼게 되면, 나는 종종 나중에 후회할 말을 하게 된다.	1	2	3	4
8.	감정에 따라 행동하는 것을 억제하기가 어렵다.	1	2	3	4
9.	나는 기분이 나빠지면 생각 없이 행동하기 때문에 종종 문제를 악화시키곤 한다.	1	2	3	4
10.	논쟁이 격해지면, 나는 종종 나중에 후회할 말을 하곤 한다.	1	2	3	4
11.	나는 내 감정들을 항상 잘 통제한다.	1	2	3	4
12.	나는 때때로 나중에 후회할 충동적인 행동을 한다.	1	2	3	4

Appendix 11.

Multidimensional Perfectionism Scale(MPS)

■ 다음 문항들은 개개인의 성격과 특징을 기술해 놓은 것입니다. 주의 깊게 읽고 **자신과 얼마나 비슷한지 표시**해 주십시오. 자신과 비교하여 “매우 그렇다”고 생각하면 7에, “전혀 그렇지 않다”고 생각하면 1에 표시하고, ‘그저 그렇다“거나 잘 결정할 수 없을 때는 4에 표시하면 됩니다. 정답이 있거나 좋고 나쁜 답이 있는 것이 아니므로, 평소의 자신을 잘 나타내는 쪽으로 쉽고 편안하게 표시하십시오.

전혀 그렇지 않다	거의 그렇지 않다	별로 그렇지 않다	보통 이다	조금 그렇다	거의 그렇다	매우 그렇다
1	2	3	4	5	6	7

	문항	해당하는 정도						
1.	일단 일을 시작하고 나면, 다 마칠 때까지는 쉬지 않는다.	1	2	3	4	5	6	7
2.	다른 사람이 일을 너무 쉽게 포기하는 것을 봐도 욕하지 않는다.	1	2	3	4	5	6	7
3.	나와 가까운 사람이 성공하느냐 안 하느냐의 여부는 그리 중요한 일이 아니다.	1	2	3	4	5	6	7
4.	친구가 최선이 아닌 선택을 해도 비난하지 않는다.	1	2	3	4	5	6	7
5.	다른 사람이 내게 기대하는 것을 만족시키기가 어렵다.	1	2	3	4	5	6	7
6.	나의 목표는 모든 일에서 완벽해지는 것이다.	1	2	3	4	5	6	7
7.	다른 사람이 하는 일이 모두 최고 수준이어야 한다고 느낀다.	1	2	3	4	5	6	7

8.	일을 하면서 완벽을 추구하지는 않는다.	1	2	3	4	5	6	7
9.	내 주위 사람들은 내가 실수를 할 수도 있다고 쉽게 인정한다.	1	2	3	4	5	6	7
10.	내 주위 사람들이 최선을 다하지 않는 것을 봐도 나는 별로 문제 삼지 않는다.	1	2	3	4	5	6	7
11.	내가 일을 잘 할수록 사람들은 내가 더 잘할 것으로 기대한다.	1	2	3	4	5	6	7
12.	나는 완벽해지고자 하는 욕구가 거의 없다.	1	2	3	4	5	6	7
13.	내가 하는 일이 최고가 아니라면 사람들은 나를 형편없게 볼 것이다.	1	2	3	4	5	6	7
14.	나는 가능한 완벽하려고 애쓴다.	1	2	3	4	5	6	7
15.	모든 일을 완벽하게 하는 것이 나에게는 중요한 일이다.	1	2	3	4	5	6	7
16.	나는 내게 중요한 사람들에게 큰 기대를 한다.	1	2	3	4	5	6	7
17.	내가 하는 모든 일에서 최선을 다한다.	1	2	3	4	5	6	7
18.	나의 주변 사람들은 내가 모든 일을 성공시키기를 기대한다.	1	2	3	4	5	6	7
19.	주변 사람들에 대해 높은 기준을 가지고 있지는 않다.	1	2	3	4	5	6	7
20.	나 자신이 완벽해지기를 바란다.	1	2	3	4	5	6	7
21.	내가 모든 일을 잘하지 않더라도 사람들은 나를 좋아할 것이다.	1	2	3	4	5	6	7
22.	스스로 더 나아지려고 노력하지 않는 사람들을 보면 나는 참을 수가 없다.	1	2	3	4	5	6	7

23.	내가 한 실수를 발견하게 되면 아주 속이 상한다.	1	2	3	4	5	6	7
24.	친구들에게 많은 것을 기대하지는 않는다.	1	2	3	4	5	6	7
25.	성공이란 다른 사람을 기쁘게 하기 위해서 더욱 열심히 일해야 한다는 것을 의미한다.	1	2	3	4	5	6	7
26.	내가 누군가에게 일을 부탁한 경우, 그 일이 완벽하게 되어있기를 기대한다.	1	2	3	4	5	6	7
27.	나와 가까운 사람들이 실수하는 것을 참을 수 없다.	1	2	3	4	5	6	7
28.	나는 목표를 완벽하게 세우려고 한다.	1	2	3	4	5	6	7
29.	내게 중요한 사람들은 결코 나를 실망시켜서는 안된다.	1	2	3	4	5	6	7
30.	내가 어떤 일에서 성공하지 못하더라도 사람들은 나를 괜찮은 사람이라고 생각한다.	1	2	3	4	5	6	7
31.	나는 사람들이 내게 너무 많은 요구를 한다고 생각한다.	1	2	3	4	5	6	7
32.	나는 항상 나의 잠재능력을 충분히 발휘하도록 일해야 한다.	1	2	3	4	5	6	7
33.	내가 실수했을 때 사람들은 비록 나타내지는 않지만 매우 실망할 것이다.	1	2	3	4	5	6	7
34.	내가 하는 모든 일에서 최고일 필요는 없다.	1	2	3	4	5	6	7
35.	나의 가족은 내가 완벽하기를 바란다.	1	2	3	4	5	6	7
36.	나 자신에게 매우 높은 목표를 가지고 있지는 않다.	1	2	3	4	5	6	7

37.	부모님이 내가 모든 면에서 뛰어나기를 기대하시지는 않는다.	1	2	3	4	5	6	7
38.	나는 평범한 사람들을 존경한다.	1	2	3	4	5	6	7
39.	사람들은 나에게서 완벽함을 기대한다.	1	2	3	4	5	6	7
40.	나는 나 자신에게 높은 기준을 부여한다.	1	2	3	4	5	6	7
41.	사람들은 내가 할 수 있는 것보다 많은 것을 내게 기대한다.	1	2	3	4	5	6	7
42.	나는 학업에서나 일에서나 항상 성공해야 한다.	1	2	3	4	5	6	7
43.	친한 친구가 최선을 다하지 않아도 내게는 그리 문제가 되지 않는다.	1	2	3	4	5	6	7
44.	내가 실수를 할 경우에도 내 주위 사람들은 여전히 나를 유능하다고 생각한다.	1	2	3	4	5	6	7
45.	다른 사람들이 모든 일을 잘 할 것이라고 기대하지는 않는다.	1	2	3	4	5	6	7

Appendix 12.

The Eating Attitude Test-26(EAT-26)

■ 다음의 문항들을 잘 읽고, 자신이 해당되는 곳에 표시하십시오. 다른 종류의 문항들도 포함되었지만, 문항의 대부분은 음식이나 식사에 직접적으로 관련된 것입니다. 각 질문에 대해 주의 깊게 응답하시기 바랍니다.

전혀 아니다	거의 아니다	때때로 그렇다	보통 그렇다	거의 항상 그렇다	항상 그렇다
1 ……	2 ……	3 ……	4 ……	5 ……	6

	문항	해당되는 정도					
1.	살찌는 것이 두렵다.	1	2	3	4	5	6
2.	배가 고파도 식사를 하지 않는다.	1	2	3	4	5	6
3.	음식을 작은 조각으로 나누어 먹는다.	1	2	3	4	5	6
4.	자신이 먹고 있는 음식의 영양분과 열량을 알고 먹는다.	1	2	3	4	5	6
5.	빵이나 감자 같은 탄수화물이 많은 음식은 특히 피한다.	1	2	3	4	5	6
6.	내가 음식을 많이 먹으면 다른 사람들이 좋아하는 것 같다.	1	2	3	4	5	6
7.	먹고 난 다음 더 심한 죄책감을 느낀다.	1	2	3	4	5	6
8.	자신이 좀 더 날씬해져야겠다는 생각을 떨쳐 버릴 수 없다.	1	2	3	4	5	6
9.	운동을 할 때 운동으로 인해 없어질 열량에 대해 계산하거나 생각한다.	1	2	3	4	5	6

10. 남들은 내가 너무 말랐다고 생각한다.	1	2	3	4	5	6
11. 내가 살이 너무 쪘다는 생각을 떨쳐버릴 수가 없다.	1	2	3	4	5	6
12. 식사시간이 다른 사람보다 더 길다.	1	2	3	4	5	6
13. 설탕이 든 음식은 피한다.	1	2	3	4	5	6
14. 체중조절을 위해 다이어트용 음식을 먹는다.	1	2	3	4	5	6
15. 음식에 대한 자신의 조절능력을 과시한다.	1	2	3	4	5	6
16. 다른 사람들이 나에게 음식을 먹도록 강요하는 것 같이 느껴진다.	1	2	3	4	5	6
17. 단 음식을 먹고 나면 마음이 편치 않다.	1	2	3	4	5	6
18. 체중을 줄이기 위해 운동이나 다른 것을 하고 있다.	1	2	3	4	5	6
19. 위가 비어있는 느낌이 있다.	1	2	3	4	5	6
20. 새로운 기름진 음식 먹는 것을 즐긴다.	1	2	3	4	5	6

Appendix 13.

The Bulimia Test-Revised(Bulit-R)

■ 다음은 당신의 평소 식습관에 대한 질문들입니다. 요즘(최근 한 달 동안) 자신을 가장 잘 나타낸다고 생각되는 답을 골라 체크해주십시오.

1. 나는 내 식사패턴에 만족한다. ( )
① 그렇다.
② 대체로 그렇다.
③ 별로 그렇지 않다.
④ 그렇지 않다.
⑤ 전혀 그렇지 않다.

2. 당신은 스스로 "폭식한다"고 할 수 있습니까? ( )
① 절대적으로 그렇다.
② 그렇다.
③ 아마 그럴 것이다.
④ 그렇게 볼 수도 있을 것이다.
⑤ 아마도 그렇지 않을 것이다.

3. 식사량을 스스로 조절할 수 있습니까? ( )
① 거의 항상 그렇다.
② 대체로 그렇다.
③ 별로 그렇지 않다.
④ 그렇지 않다.
⑤ 전혀 그렇지 않다.

4. 나는 내 체형과 치수(size)에 만족한다. ( )
① 항상 그렇다.
② 가끔 그렇다.
③ 이따금씩 그럴 때도 있다.
④ 거의 그렇지 않다.
⑤ 전혀 그렇지 않다.

5. 내가 식사 행동을 통제할 수 없다고 느낄 때, 궤도를 회복하기 위해 단기의 다이어트나, 설사약이나 변비약을 복용하거나 손가락을 입에 넣어 구토를 하기도 하고 과도한 운동을 한다. ( )
① 항상 그렇다.
② 대체로 항상 그런 편이다.
③ 자주 그렇다.
④ 가끔 그렇다.
⑤ 전혀 그렇지 않다/ 나는 식사행동을 통제할 수 없게 된 적이 없다.

6. 나는 내 체형이나 신체 치수에 대해 늘 고민에 사로잡혀 있다. ( )
① 항상 그렇다.
② 대게 그렇다.
③ 자주 그렇다.
④ 가끔 그렇다.
⑤ 거의 혹은 전혀 그렇지 않다.

7. 너무 많은 음식을 급하게 먹는 때가 있다. ( )
① 일주일에 3회 이상
② 일주일에 2회
③ 일주일에 1회
④ 한 달에 2회 내지 3회
⑤ 한 달에 1회 혹은 없음

8. 얼마나 오랫동안 폭식을 해왔습니까? ( )
(폭식: 한동안 다이어트나 절식을 하다가 갑자기 자신을 통제할 수 없을 만큼 마구 먹어대는 행동)
① 전혀 하지 않는다.
② 세 달 미만
③ 세 달에서 1년 동안
④ 1년에서 3년 동안
⑤ 3년에서 그 이상

9. 나를 아는 사람들이 내가 한 번에 얼마나 많이 먹는지를 알면 놀랄 것이다.
( )
① 확실히 그럴 것이다.
② 거의 그럴 것이다.
③ 아마도 그럴 것이다.
④ 그럴 수도 있다.
⑤ 그렇지 않다.

10. 당신의 나이 또래인 사람들과 비교해 얼마나 체중과 체형에 집착하는 것 같습니까? ( )
① 보통보다 훨씬 더 많이
② 보통보다 많이
③ 보통 이상
④ 보통 이하
⑤ 보통보다 더 적게

11. 먹기 시작하면 멈출 수 없을 거라는 두려움 때문에 어떤 것도 먹기가 겁난다. ( )
① 항상 그렇다.
② 대체로 그렇다.
③ 자주 그렇다.
④ 가끔 그렇다.
⑤ 거의 혹은 전혀 그렇지 않다.

12. 뚱뚱해질 거라는 생각에 시달린다.
① 항상 그렇다.
② 대체로 그렇다.
③ 자주 그렇다.
④ 가끔 그렇다.
⑤ 거의 혹은 전혀 그렇지 않다.

13. 먹고 난 후 의도적으로 구토를 하는 일이 얼마나 자주 있습니까? ( )
① 일주일에 2회 내지 그 이상
② 일주일에 1회
③ 한 달에 2회 내지 3회
④ 한 달에 1회
⑤ 한달에 1회보다 더 적게 혹은 하지 않음

14. 배가 고프지 않을 때에도 음식을 많이 먹는다. ( )
① 매우 자주 그렇다.
② 자주 그렇다.
③ 그럴 때도 있다.
④ 가끔 그렇다.
⑤ 거의 혹은 전혀 그렇지 않다.

15. 내 식사량은 보통 사람들과 다르다. ( )
① 항상 그렇다.
② 대체로 항상 그런 편이다.
③ 자주 그렇다.
④ 가끔 그렇다.
⑤ 거의 혹은 전혀 그렇지 않다.

16. 폭식을 한 직후 살이 찌지 않기 위해서 과도한 운동을 하거나 단기의 다이어트, 단식, 이뇨제, 설사약이나 변비약을 먹는 등의 방법을 쓴다. ( )
① 전혀 하지 않는다/폭식을 하지 않는다.
② 거의 하지 않는다.
③ 할 때도 있다.
④ 자주 한다.
⑤ 거의 항상 한다.

17. 폭식을 할 때 탄수화물이 많이 들어있는 음식(달콤하고 전분이 많은 음식)을 먹는 경향이 있다. ( )
① 항상 그렇다.
② 대체로 항상 그런 편이다.
③ 자주 그렇다.
④ 가끔 그렇다.
⑤ 거의 혹은 전혀 폭식을 하지 않는다.

18. 대게의 사람들과 비교하여 나의 식사 행동을 통제하는 능력은 ( )
① 다른 사람들보다 훨씬 낫다.
② 비스하다.
③ 다른 사람들보다 못하다.
④ 훨씬 못하다.
⑤ 통제할 만한 능력이 전혀 없다.

19. 나는 스스로 '충동적으로 먹는 사람'이라 할 수 있다. ( )
① 확실히 그렇다.
② 그렇다.
③ 그런 편이다.
④ 그렇게 볼 수도 있을 것이다.
⑤ 그렇지 않다.

20. 나는 너무 많이 먹은 후에 내 모습을 보는 것이 싫다. ( )
① 거의 혹은 전혀 그렇지 않다.
② 가끔 그렇다.
③ 자주 그렇다.
④ 거의 항상 그렇다.
⑤ 항상 그렇다.

21. 살찌지 않으려고 노력할 때, 과도한 운동이나 단기의 다이어트, 단식, 손가락을 넣어 구토를 유도하거나, 이뇨제나 설사약, 변비약을 복용하는 것에 내가 의존하고 있다는 느낌을 받는다. ( )
① 전혀 그렇지 않다.
② 거의 그렇지 않다.
③ 그럴 수도 있다.
④ 자주 그렇다.
⑤ 거의 항상 그렇다.

22. 구토하는 것이 다른 사람들에게보다 당신에게는 수월한 방법이라고 생각하십니까? ( )
① 그렇다, 전혀 어렵지 않다.
② 그렇다, 쉬운 방법이다.
③ 비교적 쉬운 방법이다.
④ 그저 그렇다.
⑤ 쉽지 않다.

23. 음식이 내 삶을 통제하고 있다고 느껴진다. ( )
① 항상 그렇다.
② 대체로 항상 그런 편이다.
③ 자주 그렇다.
④ 가끔 그렇다.
⑤ 거의 혹은 전혀 그렇지 않다.

24. 많은 양의 음식을 먹을 때, 보통 어느 정도의 속도로 먹습니까? ( )
① 보통 사람들보다 훨씬 빨리 먹는 편이다.
② 보통 사람들보다 꽤 빨리 먹는 편이다.
③ 보통 사람들보다 빨리 먹는 편이다.
④ 보통 사람들과 비슷한 속도로 먹는다.
⑤ 보통 사람들보다 조금 느린 편이다.

25. 폭식을 한 직후 내 느낌은 ( )
① 너무 뚱뚱하고 부풀어서 참을 수 없는 정도다.
② 극도로 뚱뚱해진 느낌이다.
③ 뚱뚱하다는 느낌이다.
④ 약간 뚱뚱해진다는 느낌이다.
⑤ 내 몸이 어떻든 괜찮다고 느낀다/폭식을 하지 않는다.

26. 같은 성별의 다른 사람들과 비교해서 얼마나 먹을 것인지 조절할 수 있을 것 같은 능력은 ( )
① 비슷하거나 더 낫다.
② 못한 편이다.
③ 못하다.
④ 아주 못하다.
⑤ 형편없다.

27. 최근 3개월 동안 얼마나 자주 폭식을 했습니까? (폭식: 한동안 다이어트나 절식을 하다가 통제할 수 없을만큼 마구 먹어대는 행동) ( )
① 한달에 1회 혹은 하지 않음
② 한 달에 2회 내지 3회.
③ 일주일에 1회.
④ 일주일에 2회.
⑤ 일주일에 3회 이상.

28. 나를 아는 사람들은 내가 많은 음식을 먹은 후에 얼마나 뚱뚱해지는지를 보면 놀랄 것이다. ( )
① 분명히 그렇다.
② 그렇다.
③ 그럴 것이다.
④ 그럴 수도 있다.
⑤ 그럴 리도 없고 나는 많은 음식을 먹지 않는다.

Appendix 14.

Weight and Shape based Self Value Test(WSSV)

■ 다음의 문항들을 잘 읽고, 자신이 해당되는 정도에 표시하십시오.

전혀 아니다	아니다	보통이다	그렇다	매우 그렇다
1	2	3	4	5

	문 항	해당하는 정도				
1.	지난 4주 동안 당신의 체중이 한 인간으로서 자신의 가치를 평가하는 데 영향을 주었습니까?	1	2	3	4	5
2.	지난 4주 동안 자신의 몸매가 한 인간으로서 자신의 가치를 평가하는데 영향을 주었습니까?	1	2	3	4	5

Appendix 15.

General-Food Craving Questionnaire-Trait(G-FCQ-T)

■ 다음은 당신의 평소 식습관에 대한 질문들입니다. 문항을 읽고 당신이 현재 동의하는 정도를 표시하여 주십시오. 가능한 솔직하게 문항에 응답하여 주십시오.

전혀 그렇지 않다	그렇지 않다	약간 그렇지 않다	약간 그렇다	그렇다	매우 그렇다
1	2	3	4	5	6

	문항	해당되는 정도					
1.	어떤 음식이 당길 때, 그 음식을 먹게 되면 나는 제어하지 못할 것이다.	1	2	3	4	5	6
2.	먹고 싶은 음식을 먹게 되면, 나는 절제하지 못하고 너무 많이 먹게 된다.	1	2	3	4	5	6
3.	음식이 당길 때면, 나는 한결같이 어떻게 그 음식을 먹을 수 있을까 궁리하게 된다.	1	2	3	4	5	6
4.	나는 하루 종일 먹을 것에 대해 생각하는 것 같다.	1	2	3	4	5	6
5.	나는 늘 먹는 것에 집착한다.	1	2	3	4	5	6
6.	때로는 무언가를 먹으면, 모든 것이 다 좋아 보인다.	1	2	3	4	5	6
7.	먹고 싶던 것을 먹으면 기분이 나아진다.	1	2	3	4	5	6
8.	지루하거나 화가 나거나 슬플 때, 나는 무언가 먹고 싶어진다.	1	2	3	4	5	6
9.	음식을 먹고 나면, 불안감이 덜해진다.	1	2	3	4	5	6
10.	먹고 싶은 음식을 일단 먹기 시작하면, 끝까지 계속 먹는다.	1	2	3	4	5	6

11. 먹고 싶던 음식을 먹을 때, 기분이 최고로 좋다.	1	2	3	4	5	6
12. 일단 한번 음식을 먹기 시작하면, 멈추기가 어렵다.	1	2	3	4	5	6
13. 나는 아무리 애를 써도 먹는 것에 대한 생각을 계속하게 된다.	1	2	3	4	5	6
14. 나는 많은 시간 동안 다음에는 또 무엇을 먹을까 생각한다.	1	2	3	4	5	6
15. 일단 어떤 음식이 당기면, 그 생각을 하느라 지치게 된다.	1	2	3	4	5	6
16. 나는 감정 기복이 있을 때, 더 먹고 싶어진다.	1	2	3	4	5	6
17. 뷔페에 가게 되면, 필요 이상으로 많이 먹는다.	1	2	3	4	5	6
18. 과식하는 사람과 같이 먹게 되면, 나는 과식하게 된다.	1	2	3	4	5	6
19. 음식을 먹을 때 마음이 편안해진다.	1	2	3	4	5	6
20. 화가 났을 때, 나는 음식이 당긴다.	1	2	3	4	5	6
21. 스트레스 받을 때, 나는 음식이 당긴다.	1	2	3	4	5	6

국문초록

불확실성에 대한 인내력 부족과 이상섭식행동의 관계

불확실성에 대한 인내력 부족이란 어떠한 사건의 발생 가능성과는 상관없이 미래의 불확실성 자체를 수용하지 못하고, 부정적이고 위협적으로 해석하는 경향성(Birrell et al., 2011; Freeston et al., 1994)으로 정의된다. 최근의 연구에서 불확실성에 대한 인내력 부족은 범불안장애를 포함한 다양한 정서장애의 범진단적인 취약성으로 제안되었다. 불확실성에 대한 인내력 부족이 불안과 우울장애에 영향을 미친다는 일관된 연구결과들이 있지만, 불확실성에 대한 인내력 부족과 섭식장애의 관계를 살펴본 연구는 드물다. 이에 따라 본 연구에서는 먼저 불확실성에 대한 인내력 부족을 측정할 수 있는 도구를 한국어로 번안 및 타당화하였으며, 불확실성에 대한 인내력 부족이 이상섭식행동의 유형인 섭식절제와 폭식행동을 고유하게 예측하는 변인임을 확인하였다. 나아가 불확실성에 대한 인내력 부족이 섭식절제와 폭식행동에 영향을 미치는 과정에서 체형 및 체중에 근거한 자기 평가와 음식갈망의 매개역할을 확인하고자 하였다.

연구 I에서는 불확실성에 대한 인내력 부족을 측정할 수 있도록 개발된 단축형 불확실성에 대한 인내력 부족 척도(IUS-12)를 번안하고 신뢰도와 타당도, 요인구조를 확인하였다. 일반 대학생들(N=201)을 대상으로 수집한 자료를 분석한 결과, 척도의 신뢰도는 우수한 수준으로 나타났으며, 원척도의 2요인 구조를 따르는 것으로 확인되었다. 다만, 두 문항(문항 3과 문항11)이 각각 원척도와 다른 요인에 부하되었다. 불확실성에

대한 인내력 부족과 밀접한 관련이 있는 불안 및 우울 관련 척도들과의 상관관계를 분석한 결과, 유의미한 상관이 나타나 척도의 타당도가 양호한 것으로 나타났다.

연구 II에서는 불확실성에 대한 인내력 부족이 이상섭식행동을 고유하게 예측하는 변인임을 확인하였으며, 불확실성에 대한 인내력 부족이 섭식절제 및 폭식으로 이어지는 과정에서 체형 및 체중에 대한 과대평가와 음식갈망의 역할을 탐색하였다. 이를 위해 498명의 대학생을 대상으로 수집한 자료를 분석하였다. 위계적 회귀분석 결과, 불확실성에 대한 인내력 부족은 성별과 완벽주의를 통제한 뒤에도 섭식절제를 유의미하게 예측하였고, 성별과 부정정서조급성을 통제한 뒤에도 폭식행동을 유의미하게 예측하였다. 또한 불확실성에 대한 인내력 부족이 체형 및 체중에 대한 과대평가를 매개로 하여 섭식절제에 미치는 간접효과가 유의미하였고, 불확실성에 대한 인내력 부족이 음식갈망을 매개로 폭식행동에 미치는 간접효과 또한 통계적으로 유의미한 것으로 나타났다.

본 연구에서는 IUS-12가 불확실성에 대한 인내력 부족을 측정하는 신뢰롭고 타당한 도구임을 확인하였다. 본 연구의 결과는 불확실성에 대한 인내력이 부족한 사람들이 확실성과 통제감을 증진시키기 위한 수단으로 섭식절제를 나타낼 수 있으며, 불확실성에 대한 인내력 부족으로 인한 부정정서를 일시적으로 완화시키려는 시도로서 폭식행동을 나타낼 수 있다는 것을 시사한다. 마지막으로 본 연구가 지니는 시사점 및 한계점, 그리고 후속 연구를 위한 제언에 대해 논의하였다.

주요어 : 불확실성에 대한 인내력 부족; 이상섭식행동;
체중 및 체형에 대한 과대평가; 음식갈망

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