How deep is your thought? The relations between intolerance of uncertainty, worry and weight and shape concerns in adolescent girls with anorexia nervosa

Jozanneke Bijsterbosch (✉ j.m.bijsterbosch@uu.nl)

Universiteit Utrecht <https://orcid.org/0000-0002-0172-5180>

Anouk Keizer

Utrecht University: Universiteit Utrecht

Paul Boelen

Utrecht University: Universiteit Utrecht

Unna Danner

Altrecht

Lot Sternheim

Utrecht University: Universiteit Utrecht

Research Article

Keywords: Adolescents, anorexia nervosa, weight and shape concerns, prospective intolerance of uncertainty, inhibitory intolerance of uncertainty, worry

Posted Date: September 15th, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-882669/v1>

License: © ⓘ This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published at Journal of Eating Disorders on December 1st, 2021. See the published version at <https://doi.org/10.1186/s40337-021-00523-4>.

Abstract

Background

Inherent to anorexia nervosa (AN) are repetitive thoughts about weight and shape. Growing research suggests the relevance of intolerance of uncertainty (IU) and worry in maintaining these types of repetitive thoughts. The relation between these cognitive processes and weight and shape concerns in adolescents with AN is understudied. This study aims to investigate associations between prospective and inhibitory IU, worry, and weight and shape concerns.

Methods

In a cross-sectional study, 93 adolescent girls with AN completed three questionnaires, measuring prospective and inhibitory IU, worry, and weight and shape concerns, respectively. A mediation model with worry as a mediator between inhibitory IU and prospective IU and weight and shape concerns was tested.

Results

A direct and total effect of inhibitory IU on weight and shape concerns was found. Worry did not mediate the relation between inhibitory or prospective IU and weight and shape concerns.

Conclusions

These results confirm the importance of inhibitory IU in adolescents with AN, more specifically to weight and shape concerns. This group may benefit from intervention strategies targeting IU. Worry seems less relevant to weight and shape concerns in adolescents.

Plain English Summary

Adolescents with anorexia nervosa (AN) often experience repetitive thoughts about weight and shape. Growing research suggests the relevance of intolerance of uncertainty (IU) and worry in maintaining these types of repetitive thoughts. IU is defined as the incapacity to tolerate uncertainty and is often divided into two components; prospective IU and inhibitory IU. The relation between IU, worry and weight and shape concerns in adolescents with AN is understudied. This study aims to investigate study relations between prospective and inhibitory IU, worry, and weight and shape concerns. 93 adolescent girls with AN completed three questionnaires, measuring prospective and inhibitory IU, worry, and weight and shape concerns, respectively. The results of this study confirmed the importance of inhibitory IU in adolescents with AN, more specifically to weight and shape concerns. However, worry seems less relevant to weight and shape concerns. This group may benefit from intervention strategies targeting IU. Worry seems less relevant to weight and shape concerns in adolescents.

Introduction

Key diagnostic features of anorexia nervosa (AN) include the disturbance in the way in which one's body weight and shape is experienced and undue influence of body weight and shape on self-evaluation (APA, 2013). The typical onset of AN is during adolescence or young adulthood (Campbell & Peebles, 2014) with a peak at 15 to 17 years (Smink, van Hoeken, & Hoek, 2013). Puberty coincides with rapid changes in body size and shape, which then must be integrated within one's body image (Sattler, Eickmeyer, & Eisenkolb, 2019). These rapid changes can result in increases in weight and shape concerns (Bucchianeri et al., 2013; Fairburn, Cooper, & Shafran, 2003a; Linardon et al., 2018; Lydecker, White, & Grilo, 2017) which, in turn, are important risk factors and maintaining factors for AN (Fairburn et al., 2003; Keel et al., 2005; Stice & Shaw, 2002). Weight and shape concerns entail the subjective negative appraisal of one's body and the overvalued ideals about the personal implications of weight and shape (Garner & Garfinkel, 1982). Examining the mechanisms underlying weight and shape concerns in adolescents with AN might improve our understanding of the extreme body image disturbances that are frequently observed in AN. In fact, studies have shown that even after recovery, the body image still partially remains disturbed in AN (Engel & Keizer, 2017). A better understanding of body image disturbances may help to identify predictors AN symptomology which may translate to a more suited focus in interventions, resulting into an overall improved AN outcome. This study sought to examine the role of worry and intolerance of uncertainty in weight and shape concerns in adolescents with AN.

By definition, AN involves repeatedly thinking about weight and shape, which can take up large parts of the day (Seidel et al., 2016). Indeed, literature is starting to show that these types of repetitive thoughts are part of the anxious, rigid and obsessional phenotype associated with AN (Levinson et al., 2019). Preliminary evidence suggests the relevance of a number of core cognitive anxiety-related processes to AN (Sternheim et al., 2015), such as intolerance of uncertainty (IU) and worry (Startup et al., 2013; Sternheim et al., 2012).

IU has been defined as an individual's dispositional incapacity to endure the aversive response triggered by the perceived absence of salient, key or sufficient information, and is sustained by the associated perception of uncertainty (Carleton, 2016a). A number of studies reported significantly higher degrees of IU in AN compared to those with other types of eating disorders or healthy controls (Brown et al., 2017; Kesby et al., 2017; Sternheim et al., 2011), however research examining IU in children and adolescents is scarce (Konstantellou et al., 2019). Two studies identified elevated levels of IU in adolescents with AN (Frank et al., 2012; Konstantellou et al., 2019). Individuals with high levels of IU perceive uncertainty as threatening (Carleton, 2016a, 2016b). In those with AN, uncertainty related to weight gain and changes in shape could easily turn into an unacceptable threat and, as a result, hinder treatment focused on weight gain. Moreover, as changes in weight and shape are one of the most dominant characteristics of adolescence, the biologically driven development of body weight and shape might become even more intolerable to adolescent girls with high IU. Preliminary evidence confirms that IU is associated with weight and shape concerns in adult women with AN (Brown et al., 2017; Frank et al., 2012) and in healthy

women (Bijsterbosch et al., 2020). However, studies in adolescents girls with AN have not yet been conducted.

Research has demonstrated that IU is made up of two separate but related factors: prospective IU and inhibitory IU (e.g., Boelen & Lenferink, 2018; Carleton et al., 2007); Hong & Lee, 2015; McEvoy & Mahoney, 2011). Prospective IU refers to a desire for predictability that is driven by a sense of uneasiness with uncertainty (Hong & Lee, 2015). It represents the negative cognitive appraisals of possible future uncertain outcomes. Inhibitory IU refers to the inhibition of action or experiences as a result of apprehension of uncertainty. Individuals high in inhibitory IU freeze up in the face of uncertainty and engage in avoidance strategies, including cognitive avoidance strategies like worry (Borkovec et al., 1998). As such, inhibitory IU might be slowing down or even hindering progress in therapy when trying to use experimental or other behavioral treatment strategies to work through and diminish weight and shape concerns. Prior research has identified inhibitory IU as the most toxic component of the two as can be seen from its strong association with psychopathological symptoms and cognitive vulnerabilities such as worry in adults (Boelen & Lenferink, 2018; Hong & Lee, 2015), as well as in adolescents (Boelen, Vrinssen, & van Tulder, 2010).

The main feature of worry is the predominance of negative-type, repetitive, and preoccupied thought about possible threatening future events (Borkovec, 1994; Watkins, 2004). The predictive value of IU to worry has been firmly established across many psychiatric disorders such as generalized anxiety disorder (Koerner, Meija, & Kusec, 2017), obsessive compulsive disorder (McEvoy & Mahoney, 2012), social anxiety (Boelen et al., 2010) and eating disorders (ED; Brown et al., 2017); negative beliefs about uncertainty may lead to difficulty dealing with uncertainty which, in turn, may lead to excessive worry (Dugas, Laugesen, & Bukowski, 2012). Preliminary evidence shows that worry levels are significantly higher in adults with ED compared to those without ED, and particular in people with AN (Kerkhof et al., 2000; Startup et al., 2013; Sternheim et al., 2012). Moreover, higher levels of worry are associated with more severe ED symptomatology, including weight and shape concerns (Kerkhof et al., 2000; Sassaroli et al., 2005; Startup et al., 2013; Sternheim et al., 2015). In addition, a study by Sternheim et al. (2012) confirmed that weight and shape concerns are indeed incorporated in worries reported by adults with AN. As of yet, research has not studied this link in an adolescent population. This is relevant, because from a developmental perspective, worry is known to increase and change with age (Dugas et al., 2012; Laugesen et al., 2003).

People affected by intolerance of negative emotions tend to use worry to avoid experiencing negative emotions (Schmidt & Treasure, 2006; Wildes et al., 2010). As worrying might serve as a distraction (Vasey & Borkovec, 1992) from more distressing thought content (e.g., relationships or social problems), it is plausible that adolescents with AN use worry about weight and shape concerns to diminish the emotions connected with these concerns for this purpose. Moreover, a recent study indeed suggested that from a behavioral learning perspective, children prone to anxious feelings and worries may be more likely to develop concerns related to weight and body image as adolescents and may then seek out behaviors that offer mitigate these concerns (Schaumberg et al. 2019; Sassaroli et al., 2005). A handful of studies in

clinical and non-clinical adult populations show that worry is indeed related to body dissatisfaction (Kesby et al., 2019; Sala & Levinson, 2016; Sassaroli et al., 2005; Sternheim et al., 2012) and a longitudinal study found that child worries reported by parents at age 10 were predictive of a later onset of AN at age 14 (Schaumberg et al., 2019). However, research directly addressing the potential association between worry and weight and shape concerns in adolescents with AN is scarce.

This study investigated the mediating role of worry in the association between IU and weight and shape concerns. Based on previous findings (e.g., Frank et al., 2012), it was expected that higher levels of prospective and inhibitory IU were related to higher levels of weight and shape concerns. Additionally, a positive indirect association between prospective IU and weight and shape concerns through worry as well as a positive indirect association between inhibitory IU and weight and shape concerns through worry was expected.

Method

Participants and Procedure

This study is part of a larger study into the geno- and phenotypes in people with EDs, conducted by a specialized treatment facility in the Netherlands. Data for the current study were extracted from this larger database. Participants were included into the current study when meeting all the following criteria: age 12 to 18 years, female gender, a DSM-5 (APA, 2013) diagnosis of AN restricting (ANR) subtype or binge eating/purging (ANBP) subtype, and no missing data in the study's variables.

Participants were recruited at the time of intake at the treatment facility, and participation took place within this same period, at the beginning of treatment. Before participating, participants were informed about the procedure and were given the opportunity to ask questions about the study. Participants who then signed the informed consent form were enrolled in the study. The EDE interview was administered by trained advanced clinical psychology students at the treatment facility. The EDE interview is part of the intake procedure and is scheduled to take approximately 60 minutes. All other measures were completed on a computer at the treatment facility, which were programmed using Inquisit software (version 4; Millisecond, 2016). Participants were told to read the instructions of each questionnaire carefully. Completing the entire test battery took approximately 45-60 minutes. The researcher was nearby, in case there were any questions. Afterwards, participants were debriefed and given the opportunity to indicate whether or not they wanted to be informed about the results of the study. The research protocol was authorized by the Committee Scientific Research of Altrecht Mental Health Institute and the Medical Ethical Committee of the University Medical Center Utrecht.

Measures

Intolerance of Uncertainty. The Intolerance of Uncertainty Scale (IUS-12; Carleton et al., 2007) measures one's IU as expressed in several domains, including emotion, cognition and behavior. It has two subscales, tapping prospective IU and inhibitory IU, respectively. Respondents rate the degree to which

each of 12 items apply to them on 5-point Likert scale ranging from 1 (*not at all characteristic of me*) to 5 (*entirely characteristic of me*). An example of an item of the prospective IU subscale is “It frustrates me not having all the information I need.” An example of the inhibitory IU subscale is “When it is time to act, uncertainty paralyzes me”. Subscale scores were calculated by summing up the respective items, with higher scores indicating higher levels of IU. The Dutch version of the IUS-12 has good psychometric properties (Helsen et al., 2013). In the current study, the IUS-12 total had a good internal consistency ($\alpha = .89$), the internal consistency of the prospective IU subscale was considered good ($\alpha = .86$) and that of the inhibitory IU subscale ($\alpha = .75$) was considered acceptable.

Worry. The Penn State Worry Questionnaire (PSWQ; Meyer et al., 1990) contains 16 items that assess pathological worry on a 5-point Likert scale ranging from 1 (*not at all typical*) to 5 (*very typical*). An example item is “My worries overwhelm me.” Total scores were calculated by summing all the item scores (after reversing some of them), resulting in a possible range of 16 to 80. Higher scores indicate higher levels of pathological worry. The Dutch PSWQ has very good psychometric properties (Kerkhof et al., 2000). The PSWQ had good internal consistency in the current study ($\alpha = .84$).

Weight and shape concerns. The Eating Disorder Examination (EDE, 12th edition) is widely regarded as the “Gold Standard” to measure of eating disorder psychopathology and behaviors. It is an investigator-based clinical interview that provides a comprehensive assessment of the frequency and the severity of key behavioral and psychological aspects of eating disorders (Fairburn & Cooper, 1993). It focuses on the past 28 days and assesses the main behavioral and attitudinal features of eating disorders. The behavioral features are measured in terms of their frequency and the number of days on which they occurred. For the remaining items, the interviewer rates the participant’s response on a 0-6 scale of severity, with higher scores indicating greater levels of psychopathology. It comprises four subscales: Restraint, Shape Concern, Weight Concern and Eating Concern. For the purpose of this study only the subscales Weight Concern and Shape Concern are used. The mean of the items of these subscales was calculated, considering that factor analysis suggests that the items of both subscales generally load on one factor (Wade et al., 2008). The EDE has demonstrated good internal consistency, inter-rater reliability and convergent and discriminant validity for the subscales in samples of adolescents (Vannucci et al., 2014).

Procedure

Participants were recruited at the time of intake at the treatment facility, and participation took place within this same period, at the beginning of treatment. Before participating, participants were informed about the procedure and were given the opportunity to ask questions about the study. Participants who then signed the informed consent form were enrolled in the study. The EDE interview was administered by trained advanced clinical psychology students at the treatment facility. The EDE interview is part of the intake procedure and is scheduled to take approximately 60 minutes. All other measures were completed on a computer at the treatment facility, which were programmed using Inquisit software (version 4; Millisecond, 2016). Participants were told to read the instructions of each questionnaire carefully.

Completing the entire test battery took approximately 45-60 minutes. The researcher was nearby, in case there were any questions. Afterwards, participants were debriefed and provided with the opportunity to indicate whether or not they wanted to be informed about the results of the study. The research protocol was authorized by the Committee Scientific Research of Altrecht Mental Health Institute and the Medical Ethical Committee of the University Medical Center Utrecht.

Statistical Analysis

The statistical analyses were performed using IBM SPSS Statistics Version 26 (IBM Corp., 2019) and PROCESS for SPSS v3.0 (Hayes, 2018). Scores on IUS12 and EDE were normally distributed. Scores on the PSWQ violated the assumption of normality ($\text{skew}/SE > |1.96|$; Field, 2009). However, it was decided not to remove the outliers in order to maintain a complete clinical representation of the participants. The sample of this study was large enough ($N > 40$) to be able use parametric procedures (Ghasemi & Zahediasl, 2012).

First of all, bivariate associations between the study variables were analysed using Pearson correlation coefficients. Then, a mediation analysis with prospective IU and inhibitory IU as predictors, worry as mediator and weight and shape concerns as outcome was conducted. As previous research has shown that certain features could impact the clinical presentation of AN (e.g., Accurso et al., 2014), age of onset, duration of illness and BMI were entered as control variables. The mediation analysis comprises the following steps (Hayes, 2018): First, in order to estimate the unique effects of prospective and inhibitory IU on worry, a multiple regression analysis was calculated. Second, a hierarchical regression analysis was calculated in order to estimate the unique total effects of prospective and inhibitory IU (Step 1) and the unique direct effects of prospective and inhibitory IU as well as worry (Step 2) on weight and shape concerns. Third, the unique indirect effects of prospective and inhibitory IU on weight and shape concerns through worry were determined by means of bootstrap analyses with 5,000 bootstrap samples (Hayes, 2018). Standardized coefficients are reported. In addition, Body Mass Index (BMI). Age of onset and duration of illness will be used as control variables.

Results

Descriptive Statistics

In total 93 participants (76 ANR and 17 ANBP) participated in this study. Participants had an average age of 15.91 years ($SD = 1.64$) and an average amount of educational years of 10.44 ($SD = 2.19$). The average BMI was 16.93 ($SD = 2.17$), placing the BMI-for-age at the sixth percentile just within the range of a healthy weight (below the fifth percentile is indicative for underweight; <https://www.cdc.gov>). The average age of onset of AN was 14.11 ($SD = 1.67$), and the average illness duration was 1.80 years ($SD = 1.51$). Table 1 displays the means, standard deviations and the bivariate correlations between the study's variables. The levels of prospective and inhibitory IU found in this study were higher in comparison to a nonclinical adolescent population (Boelen et al., 2010). In addition, the levels of worry obtained in this

study were comparable to a nonclinical adolescent female group (Pace et al., 2018) and clinical adults with AN (Sassaroli, et al., 2005), however, lower than the levels found in adults with AN of other studies (Startup et al. 2013, Sternheim et al., 2011). The levels of weight and shape concerns found in this study fell within the range to be expected in a clinical sample of adolescent girls with AN (Calguli & Delle Grave, 2019). A moderate correlation was found between prospective IU, inhibitory IU and worry. The correlation between inhibitory IU and weight and shape concerns is considered moderate and the associations prospective IU and weight and shape concerns is weak. Worry did not correlate with weight and shape concerns.

Table 1

Means, Standard Deviations and Bivariate Correlations of Analysis Measures (N= 93).

	<i>M</i>	<i>SD</i>	1	2	3	4
1. Prospective IU	19.58	4.64	-	-	-	-
2. Inhibitory IU	15.94	3.89	.67**	-	-	-
3. PWSQ	46.12	6.38	.46**	.41**	-	-
4. EDE weight and shape concern	3.63	1.38	.22*	.45**	.14	-
<i>Note.</i> EDE = Eating Disorder Examination, IU = intolerance of uncertainty; PSWQ = Penn State Worry Questionnaire;.						
* $p < .05$. ** $p < .01$.						

Total, Direct, and Indirect Effects of Prospective and Inhibitory IU on Weight and Shape Concerns through Worry

The multiple regression analysis revealed a significant effect of prospective IU and a nonsignificant effect of inhibitory IU (see Fig. 1). A total of 25.4% of the variance in worry could be explained, $F(5, 87) = 5.910$, $p < .001$.

The hierarchical regression revealed a nonsignificant negative total effect of prospective IU and a significant positive total effect of inhibitory IU in Step 1. In addition, a nonsignificant negative direct effect of prospective IU on weight and shape concerns was revealed and a significant positive effect of inhibitory IU on weight and shape concerns in Step 2 (see Fig. 1). Furthermore, in Step 2, a nonsignificant negative effect of worry on weight and shape concerns was found (see Fig. 1). A total of 27.4% of the variance in weight and shape concerns could be explained $F(6, 86) = 5.416$, $p < .001$.

The bootstrap analyses revealed a nonsignificant negative indirect effect of prospective IU, $-.003$, BC 95% confidence interval (CI) $[-.04, -.09]$, and a nonsignificant negative indirect effect of inhibitory IU, $-.002$, BC

95% CI [.03, – .05], on weight and shape concerns through worry. Worry thus did not mediate the relationship of both prospective IU and inhibitory IU with weight and shape concerns.

Discussion

The present study investigated the relationships of prospective IU and inhibitory IU with worry and weight and shape concerns. More specifically, the mediating role of worry in the associations between the IU dimensions and weight and shape concerns was examined. Taken together, our results partly confirmed our hypotheses.

Regarding our IU hypotheses, we expected prospective IU as well as inhibitory IU to be associated with weight and shape concerns. However, only the association of inhibitory IU with weight and shape concerns was found. This study was the first, to the best of our knowledge, to investigate relations between weight and shape concerns and the two components of IU separately in a clinical adolescent AN sample. Our expectations were based on previous clinical studies finding total scores of IU associated with weight and shape concerns in AN (Frank et al., 2012) and on results from a study by Lenferink and Boelen (2018), suggesting that clinically inhibitory IU may be of more importance to more severe ED symptomatology. Indeed results confirm the importance of inhibitory IU to AN, and specifically to weight and shape concerns.

Although the levels of worry were in accordance with the levels of worry found by Sassaroli and colleagues (2005), levels were not as high as found in more recent studies of adults with AN (Startup et al., 2013). Worry levels in the present study can be interpreted as moderate; individuals that can be bothered by worries but are just below clinical range for worry (Meyer et al., 1990). Moderate worry still serves as an adaptive process as it prepares individuals for future threat and increases motivation among other things (Davey, 1994; Songo et al., 2020). However, when moderate worry turns into pathological worry it becomes of clinical concern. Notably, interpreting these results is a relatively complex matter as this is first study investigating worry in adolescent girls with AN which makes it impossible to compare current results to other studies investigating a similar population. Additionally, as excessive worry is often observed in adults with AN, it is suggested that worry levels should always be monitored closely in therapy and targeted when necessary as worry is suggested to be particularly relevant for AN development which may contribute to shared risk to anxiety disorders and AN (Llyod et al., 2020; Schaumberg et al., 2019).

Interestingly, whilst clinical levels of worry have been detected in adults with AN (e.g., Sternheim et al., 2012), we failed to establish an association between worry and weight and shape concerns and as a result we did not replicate these findings in the present sample of adolescents with AN. One explanation might be related to the contents of worry. As worry becomes increasingly elaborate and abstract during adolescence (Vasey, 1993), contents shift from worrying about e.g., the monster under the bed in childhood to more broader psychopathological issues such as the fear of rejection or the fear of being evaluated negatively in puberty (Laugesen et al., 2003; Sternheim et al., 2011). One could speculate that

adolescent girls with AN feel overwhelmed by and struggle with managing these changes and that as a possible result, they fill the content of their worries with ED - specific worries which at this stage makes them feel safe and in control. It has been suggested that worry serves the short-term purpose of distraction or relief from more terrifying thoughts (e.g., relationships or social problems), but may lead to weight and shape concerns at a later stage (Sala & Levinson, 2016). Indeed, a recent longitudinal study found that child worries reported by parents at age 10 were predictive of a later onset of AN at age 14 and more specifically of body dissatisfaction and weight concerns (Schaumberg et al. 2019). As such, worry may still function as a facilitator of positive beliefs about worry (e.g., worrying can reduce uncertainty; Dugas & Koerner, 2005) in adolescents with AN and is not yet experienced as a salient component of the repetitive thoughts that are bothering many adults with AN during the entire day. To examine this theory, longitudinal studies are required assessing these developmental elements in these relations in patients with AN during their transition from adolescence into adulthood. Future studies should also explore the exact nature of worry but also its different functions to further clarify the complexity of this construct.

Regarding the associations of prospective and inhibitory IU and worry, it was found that only prospective IU was related to worry when controlling for inhibitory IU. Specifically, these higher levels of prospective IU and its association with higher levels of worry do not corroborate with earlier studies in nonclinical adolescents (Boelen et al., 2010) and nonclinical adults (Boelen & Lenferink, 2018). In these studies, it was found that higher levels of inhibitory IU were associated with higher levels of worry, although worry levels were much lower in both studies. Nonetheless, this study replicates findings from other studies that highlight IU as an important contributing factor to worry (e.g., Sternheim et al., 2012). In addition, differentiating between prospective and inhibitory IU in the association with worry might impact approaches in intervention.

Findings from the present study contribute to a growing body of literature positing IU as an important factor that can be linked to the development and maintenance symptoms of AN such as weight and shape concerns (Frank et al., 2012; Sternheim et al., 2011; Sternheim et al., 2017). Previous studies have shown that IU is a malleable mechanism and CBT-type interventions for IU have shown success in reducing IU (Boswell et al., 2013). Furthermore, experimental studies in adult samples have shown that changes in IU lead to corresponding changes in worry (Grenier & Ladouceur 2004; Ladouceur et al., 2000; Rosen & Knauper, 2009; Rosen et al., 2007). One could argue that adolescents with AN may benefit from additional interventions that target IU as well as diminishing levels of IU might help to prevent worry from growing and becoming an integrative part of the repetitive thinking style as observed in adult populations with AN (Sternheim et al., 2012).

As of yet, we do not know whether addressing IU will also help to lower levels of weight and shape concerns, possibly contributing to an improved path to recovery. Individuals with AN who experience more severe ED pathology problems such as weight and shape concerns are more likely to have a worse outcome and may be at greater risk of dropping out of treatment (Vall & Wade, 2015). IU might well be part of the mechanism underlying these body image disturbances. Future research should focus on body image related IU and how to target this in interventions that are suitable for adolescents with AN. It may

be beneficial to address IU among individuals with AN in order to prevent worry from becoming part of the repetitive thinking style and diminish ED symptoms such as weight and shape concerns along the way.

Some limitations need to be acknowledged. Due to the cross-sectional design, the direct of causality in the associations between the constructs could not definitely be determined (Winer et al., 2016). In addition, it is suggested that a longitudinal study that could start in early adolescence and follow up into adulthood would provide a better insight in the development of the transition of nonclinical worry in an adolescent sample into pathological levels of worry as is seen in an adult AN sample (e.g., Startup, et al., 2013; Sternheim et al., 2012). Furthermore, future might focus on for instance general worry as well as on positive beliefs about worry and eating disorder specific worry. In doing so, the precise nature and function of worry might be further unraveled and result into an improved understanding of worry. Lastly, although the carefully selected PSWQ has been the most widely-used measure of the frequency, intensity, and uncontrollability of worry and it has been employed within both clinical and non-clinical populations (Meyer et al., 1990), it could well be that other instruments would have been more suited to capture the construct of worry within a population of adolescent AN girls with a mean age of almost 16 years old. Using the PSWQ provided the option to at least compare our results to adult studies. Moreover, given the mean age of the studied population the PSWQ seemed more appropriate than the PSWQ-Children (Chorpita et al., 1997) or studies that use instruments that are tapping into more general anxiety symptoms but not specifically into worry itself (e.g., the revised children's anxiety and depression scale; Chorpita et al., 2000).

Conclusions

In sum, this study contributes to the understanding of distinguishing components of IU and their associations with weight and shape concerns as it partly confirms our expectancy; inhibitory (but not prospective) IU co-occurs with weight and shape concerns in a large adolescent AN sample. This might indicate the importance of core cognitive anxiety-related processes such as IU in adolescents with AN. Furthermore, special attention could be given to the role of inhibitory IU within research as well as in interventions. A better understanding of inhibitory IU and weight and shape concerns might be helping in disentangling the complexity of body image disturbances, especially in adolescent girls when biologically driven changes of their bodies might lead an intolerable feeling of uncertainty. In contrast to our expectations, worry does not seem to be integrated in the cognitive processes of adolescents with AN as of yet. The precise nature and function of worry seems to be more complex to interpret.

Abbreviations

AN: anorexia nervosa

ANR: anorexia nervosa restrictive subtype

ANBP: anorexia nervosa binge/purge subtype

APA: American Psychiatric Association

DSM-5: Diagnostic and Statistical Manual of mental Disorders

ED: eating disorders

EDE: Eating Disorder Examination

CBT: cognitive behavioral therapy

IU: intolerance of uncertainty

IUS-12: intolerance of uncertainty scale

PSWQ: Penn State Worry Questionnaire

Declarations

Ethical Approval and Consent to participate

The research protocol was authorized by the Committee Scientific Research of Altrecht Mental Health Institute and the Medical Ethical Committee of the University Medical Center Utrecht.

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

Consent for publication

All authors have consented in publishing the manuscript

Availability of supporting data

Supporting data are unfortunately unavailable as a consequence of the strict regulations regarding the privacy of the patients.

Competing interests

Not applicable

Funding

Not applicable

Authors' contributions

Jojanneke Bijsterbosch and Lot Sternheim conceived of the presented idea. Jojanneke Bijsterbosch and Unna Danner executed the study. Jojanneke Bijsterbosch carried out the statistical analyses which were

verified by Femke van den Brink (see acknowledgements). Jojanneke Bijsterbosch wrote the manuscript as part of her PhD project which was supervised by Lot Sternheim, Anouk Keizer and Paul Boelen. All authors discussed the results and contributed to the final manuscript.

Acknowledgements

We thank Dr. F. van den Brink for her advice on the statistical analyses.

References

- Aardoom, J. J., Dingemans, A. E., Slof Op 't Land, M. C. T., & Van Furth, E. F. (2012). Norms and discriminative validity of the Eating Disorder Examination Questionnaire (EDE-Q). *Eating Behaviors*, 13, 4, 305-309. <http://doi.org/10.1016/j.eatbeh.2012.09.002>
- American Psychiatric Association (2013). *The Diagnostic and Statistical Manual of mental Disorders, Fifth Edition: DSM 5*. Virginia: American Psychiatric Association.
- Accurso, E. C., Ciao, A. C., Fitzsimmons-Craft, E. E., Lock, J. D., & Le Grange, D. (2014). Is weight gain really a catalyst for broader recovery?: The impact of weight gain on psychological symptoms in the treatment of adolescent anorexia nervosa. *Behaviour Research and Therapy*, 56,1-6. <http://doi.org/10.1016/j.brat.2014.02.00>.
- Berenbaum, H., Bredemeier, K., & Thompson, R. J. (2008). Intolerance of uncertainty: Exploring its dimensionality and associations with need for cognitive closure, psychopathology, and personality. *Journal of Anxiety Disorders*, 22(1), 117–125. <https://doi.org/10.1016/j.janxdis.2007.01.004>
- Berg, K. C., Peterson, C. B., Frazier, P., & Crow, S. J. (2012). Psychometric evaluation of the eating disorder examination and eating disorder examination-questionnaire: A systematic review of literature. *International Journal of Eating Disorders*, 45, 428-438. <http://dx.doi.org/10.1002/eat.20931>
- Bredemeier, K., & Berenbaum, H. (2008). Intolerance of uncertainty and perceived threat. *Journal of anxiety disorders*, 46(1), 28-38. <http://doi.org/10.1016/j.brat.2007.09.006>
- Bijsterbosch, J. M., van den Brink, F., Vollmann, M, Boelen, P. A., & Sternheim, L. C. (2020). Understanding Relations between Intolerance of Uncertainty, Social Anxiety, and Body Dissatisfaction in Women. *Journal of Nervous and Mental Diseases*, 208(10), 833-835. <http://doi.org/10.1097/NMD.000000000000120>
- Boelen, P. A. & Lenferink, L. I. M. (2018). Latent class analysis of indicators of intolerance of uncertainty. *Scandinavian Journal of Psychology*, 59, 243–251. <http://doi.org/10.1111/sjop.12440>
- Boelen, P. A., Vrinssen, I., & van Tulder. (2010). Intolerance of uncertainty in adolescents: correlated with worry, social anxiety, and depression. *Journal of Nervous and Mental Disorders*, 198(3), 194-200. <http://doi.org/10.1097/NMD.0b013e3181d143de>

- Borkovec, T. D. (1994). *The nature, functions, and origins of worry*. In G. C. L. Davey & F. Tallis (Eds.), *Worrying: perspectives on theory, assessment, and treatment*. Chichester: Wiley.
- Borkovec, T. D., Ray, W. J. & Stober, J. (1998). Worry: A cognitive phenomenon intimately linked to affective, physiological, and interpersonal behavioral processes. *Cognitive Therapy and Research*, 22, 561–576.
- Boswell, J. F., Thompson-Hollands, J., Farchione, T. J., & Barlow, D. H. (2013). Intolerance of uncertainty: A common factor in the treatment of emotional disorders. *Journal of Clinical Psychology*, 69, 630–645. <http://doi.org/10.1002/jclp.21965>
- Brown, M., Robinson, L., Campione, G. C., Wuensch, K., Hildebrandt, T., & Micali, N. (2017). Intolerance of uncertainty in eating disorders: a systematic review and a meta-analysis. *European Eating Disorders Review*, 25, 329-343. <http://doi.org/10.1002/erv.2523>
- Bucchianeri, M. M., Arikian, A. J., Hannan, P. J., Eisenberg, M. E., & Neumark-Sztainer, D. (2013). Body dissatisfaction from adolescence to young adulthood: findings from a 10-year longitudinal study. *Body Image*, 10(10), 1-7. <http://doi.org/10.1016/j.bodyim.2012.09.001>
- Calguli, S., & Dalle Grave, R. (2019). Body image concern and treatment outcomes in adolescents with anorexia nervosa. *International Journal of Eating Disorders*, 52, 582-585. <http://doi.org/10.1002/eat.23031>
- Campbell, K. & Peebles, R. (2014) Eating disorders in Children and Adolescents. *Pediatrics*, 134(3), 582-592. <http://doi.org/10.1542/peds.2014-0194>
- Carleton, R. N. (2016a). Into the unknown: A review and synthesis of contemporary models involving uncertainty. *Journal of Anxiety Disorders*, 39, 30–43. <https://doi.org/10.1016/j.janxdis.2016.02.007>
- Carleton, R. N. (2016b). Fear of the unknown: One fear to rule them all? *Journal of Anxiety Disorders*, 41, 5–21. <https://doi.org/10.1016/j.janxdis.2016.03.011>.
- Carleton, R. N., Norton, P. J. & Asmundson, G. J. G. (2007). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. *Journal of Anxiety Disorders*, 21, 105–117. <http://doi.org/10.1016/j.janxdis.2006.03.014>
- Centers for Disease Control and prevention. (2021, February 7). *BMI Percentile Calculator for Child and Teen*. <https://www.cdc.gov/healthyweight/bmi/calculator.html>
- Dugas, M. J., Laugesen, N., & Bukowski, W. M. (2012). Intolerance of uncertainty: fear of anxiety, and adolescent worry. *Journal of Abnormal Child Psychology*, 40, 838 – 870. <http://doi.org/10.1007/s10802-012-9611-1>
- Dugas, M. J., & Koerner, N. (2005). Cognitive-behavioral treatment for generalized anxiety disorder: Current status and future directions *Journal of Cognitive Psychotherap*, 19, 61-81.

<http://doi.org/10.1891/088983905780907252>

Engel, M. M., & Keizer, A. (2017). Body representation disturbances in visual perception and affordance perception persist in eating disorder patients after completing treatment. *Scientific Reports*, 7, 16184. <http://doi.org/10.1038/s41598-017-16362-w>

Fairburn, C. G., & Cooper, Z. (1993). *The Eating Disorder Examination (12th Edition)*. In C. G. Fairburn & G. T. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (p 317 -360). Guildford Press.

Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behavior therapy for eating disorders: a “transdiagnostic” theory and treatment. *Behaviour Research and Therapy*, 41, 5, 509-528. [http://doi.org/10.1016/s0005-7967\(02\)00088-8](http://doi.org/10.1016/s0005-7967(02)00088-8)

Field, A. (2009). *Discovering Statistics Using SPSS* (2nd edition, reprinted). London (United Kingdom)): Sage.

Frank, G. K., Roblek, T., Shott, M. E., Jappe, L. M., Rollin, M. D., Hagman, J. O., & Pryor, T. (2012). Heightened fear of uncertainty in anorexia and bulimia nervosa. *International Journal of Eating Disorders*, 45(2), 227–232. <https://doi.org/10.1002/eat.20929>.

Freeston, M., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences*, 17, 791–802. [https://doi.org/10.1016/0191-8869\(94\)90048-5](https://doi.org/10.1016/0191-8869(94)90048-5).

Garner, D. M., & Garfinkel, P. E. (1982). Body image in anorexia nervosa: Measurement, theory and clinical implications. *The International Journal of Psychiatry in Medicine*, 157, (11), 1799-1805.

Ghasemi, A., & Zahediasl, A. (2012). Normality Tests for Statistical Analysis: A Guide for Non-Statisticians. *International Journal of Endocrinology Metabolism*, 2, 486-489. <http://doi.org/10.582/ijem.3505>

Grenier, S., & Ladouceur, R. (2004). Manipulation de l'intolerance a l'incertitude et inquietudes [Manipulation of intolerance of uncertainty]. *Canadian Journal of Behavioural Science*, 36, 56-65. <http://doi.org/10.1037/h0087216>

Hayes, A. F. (2018). *Introduction to Mediation, Moderation, and Conditional Process Analysis Second Edition: A Regression-Based Approach*. New York, NY: Guilford Press.

Hudson, J. I., Hiripi, E., Pope, H. G. Jr., & Kessler, R. C. (2007).

The Prevalence and Correlates of Eating Disorders in the National Comorbidity Survey Replication. *Biological Psychiatry*, 61(3):348-58. <http://doi.org/10.1016/j.biopsych.2006.03.040>

Helsen, K., Van den Bussche, E., Vlaeyen, J. W. S. & Goubert, L. (2013). Less is more. Confirmatory factor analysis of the Dutch Intolerance of Uncertainty Scale: Comparison of the full and short version. *Journal*

of Behavior Therapy and Experimental Psychiatry, 44, 21–29. <http://doi.org/10.1016/j.jbtep.2012.07.004>

Hong, R. Y., & Lee, S. S. M. (2015). Further clarifying prospective and inhibitory intolerance of uncertainty: Factorial and construct validity of test scores from the Intolerance of Uncertainty Scale. *Psychological Assessment*, 27(2), 605–620. <https://doi.org/10.1037/pas0000074>

Keel, P. K., Dorner, D. J., Franko, D. L., Jackson, S. C., & Herzog, D. B. (2005). Postremission predictors of relapse in women with eating disorders. *American Journal of Psychiatry*, 162, 2263–2268. <http://doi.org/10.1176/appi.ajp.162.12.2263>

Kerkhof, A., Hermas, D., Figee, A., Laeremans, I., Pieters, G., & Aardema. (2000). De Penn State Worry Questionnaire en de Worry Domains Questionnaire: eerste resultaten bij Nederlandse en Vlaamse Klinische en poliklinische populaties [Penn State Worry Questionnaire and the Worry Domains Questionnaire: First results in Dutch and Flemish in- and outpatient groups]. *Gedragstherapie*, 33(2), 135–145.

Kesby, A., Maguire, S., Brownlow, R., & Grisham, J. (2017). Intolerance of Uncertainty in eating disorders: An update on the field. *Clinical Psychology Review*, 56, 94–105. <https://doi.org/10.1016/j.cpr.2017.07.002>.

Kesby, A., Maguire, S., Vartaniana, L. R., & Grisham, J. R. (2019). Intolerance of uncertainty and eating disorder behaviour: Piloting a consumption task in a non-clinical sample. *Journal of Behavior Therapy and Experimental Psychiatry*, 65. <http://doi.org/10.1016/j.jbtep.2019.101492>

Key, A., George, C. L., Beattie, D., Stammers, K., Lacey, H., & Waller, G. (2001). Body image treatment within an inpatient program for anorexia nervosa: The role of mirror exposure in the desensitization process. *International Journal of eating Disorders*, 31(2), 185–190. <http://doi.org/10.1002/eat.10027>

Koerner, N., Meija, T., & Kusec, A. (2017). What's in the name? Intolerance of uncertainty, other uncertainty-relevant constructs, and their differential relations to worry and generalized anxiety disorder. *Cognitive Behaviour Therapy*, 46(2), 141–161. <https://doi.org/10.1080/16506073.2016.1211172>

Konstantellou, A., Hale, L., Sternheim, L., Simic, M. & Eisler, I. (2019). The experience of intolerance of uncertainty for young people with a restrictive eating disorder: a pilot study. *Eating and weight disorders – Studies on Anorexia, Bulimia, and Obesity*, 24, 533–540. <https://doi.org/10.1007/s40519-019-00652-5>

Ladouceur, R., Gosselin, P., & Dugas, M. J. (2000). Experimental manipulation of intolerance of uncertainty: a study of a theoretical model of worry. *Behaviour Research and Therapy*, 38, 933–941. [http://doi.org/10.1016/S0005-7967\(99\)00133-3](http://doi.org/10.1016/S0005-7967(99)00133-3)

Levinson, C. A., Brosof, L. C., Shankar Ram, S., Pruitt, A., Russell, S., & Lenze, E. J. (2019). Obsessions are strongly related to eating disorder symptomatology in anorexia nervosa and atypical anorexia nervosa.

Eating Behaviors, 34, 101298. <http://doi.org/10.1016/j.eatbeh.2019.05.001>

Linardon, J., Phillipou, A., Castle, D., Newton, R., Harrison, P., Cistullo, L. L., Griffiths, S., Hindle, A., & Brennan, L. (2018). The relative associations of shape and weight overevaluation, preoccupation, dissatisfaction, and fear of weight gain with measures of psychopathology: An extension study in individuals with anorexia nervosa. *Eating behaviors*, 29, 54-58.

<http://doi.org/10.1016/j.eatbeh.2018.03.002>

Lloyd, E. C., Sallis, H. M., Verplanken, B., Haase, A. M., & Munafò, M. R. (2020). Understanding the nature of association between anxiety phenotypes and anorexia nervosa: a triangulation approach. *BMC Psychiatry*, 7, 495. <http://doi.org/10.1186/s12888-020-02883-8>

Lydecker, J. A., White, M. A., & Grilo, C. M. (2017). Form and formulation: Examining the distinctiveness of body image constructs in treatment-seeking patients with binge-eating disorder. *Journal of Consulting and Clinical Psychology*, 85(11), 1095-1103. <http://doi.org/10.1037/ccp0000258>

McEvoy, P. M., & Mahoney, A. E. J. (2011). Achieving certainty about the structure of intolerance of uncertainty in a treatment-seeking sample with anxiety and depression. *Journal of Anxiety Disorders*, 25, 112–122. <https://doi.org/10.1016/j.janxdis.2010.08.010>

McEvoy, P. M., & Mahoney, A. E. J. (2012). To be sure, to be sure: intolerance of uncertainty mediates symptoms of various anxiety disorders and depression. *Behavior Therapy*, 43, 533-545. <http://doi.org/10.1016/j.beth.2011.02.007>

Meyer, T. J., Miller, M. L., Metzger, R. L. & Borkovec, T. D. (1990). Development and validation of the penn state worry questionnaire. *Behaviour Research and Therapy*, 28(6), 487-495.

Pace, U., Passanisi, A., & D'Urso, G. (2018). Emotional and cognitive correlations of hating among adolescents: an exploratory study. *Journal of Adolescence*, 68, 159-164. <http://doi.org/10.1016/j.adolescence.2018.08.002>

Rosen, N. O., & Knäuper, B. (2009). A little uncertainty goes a long way: state and trait differences in uncertainty interact to increase information seeking but also increase worry. *Health communication*, 24, 228–238. <http://doi.org/10.1080/10410230902804125>

Rosen, N. O., Knäuper, B., & Sammut, J. (2007). Do individual differences in intolerance of uncertainty affect health monitoring? *Psychology and Health*, 22, 413–430. <http://doi.org/10.1080/14768320600941038>

Sala, M., & Levinson, C. A. (2016). The longitudinal relationship between worry and disordered eating: Is worry a precursor or consequence of disordered eating? *Eating Behaviors*, 23, 28-32. <http://doi.org/10.1016/j.eatbeh.2016.07.012>

- Sassaroli, S., Bertilli, S., Decoppi, M., Crosima, M., Milos, G., & Ruggiero, G. M. (2005). Worry and eating disorders: a pathological association. *Eating Behaviors*, 6, 201-307. <https://doi.org/10.1002/eat.20079>
- Sattler, F. A., Eickmeyer, S., & Eisenkolb, J. (2019). Body image disturbances in children and adolescents with anorexia nervosa and bulimia nervosa: a systematic review. *Eight and weight disorders – Studies on Anorexia, Bulimia and Obesity*, 25, 857-865. <http://doi.org/10.1007/s40519-019-00725-5>
- Schaumberg, K., Zerwas, S., Goodman, E., Yilmaz, Z., Bulik, C. M., & Micali, N. (2019). Anxiety disorder symptoms at age 10 predict eating disorder symptoms and diagnoses in adolescence. *Journal of Child Psychology and Psychiatry*, 60(6), 686-696. <http://doi.org/10.1111/jcpp.12984>
- Schmidt, U., & Treasure, J. (2006). Anorexia nervosa: valued and visible. A cognitive interpersonal maintenance model and its implications for research and practice. *British Journal of Clinical Psychology*, 45, 343-366. <http://doi.org/10.1348/014466505X53902>
- Seidel, M., Petermann, J., Diestel, S., Ritschel, F., Boehm, I., King, J. A., Geisler, D., Bernardoni, F., Roessner, V., Goschke, T., & Erlich, S. (2016). A naturalistic examination of negative affect and disorder-related rumination in anorexia nervosa. *European Child & Adolescent Psychiatry*, 25, 1207-1216.
- Songco, A., Hudson, J. L., & Fox, E. (2020). A Cognitive Model of Pathological Worry in Children and Adolescents: A Systematic Review. *Clinical Child and Family Psychological Review*, 23(2), 229-249. <http://doi.org/10.1007/s10567-020-00311-7>
- Startup, H. M., & Erickson, T. M. (2006). The Penn State Worry Questionnaire (PSWQ). In Davey, G. C. L. and Wells, A. (Eds.), *Worry and its Psychological Disorders* (pp. 101–120). Chichester: John Wiley.
- Startup, H., Lavender, A., Oldershaw, A., Stott, R., Tchanturia, K., Treasure, J., & Schmidt, U. (2013). Worry and Rumination in Anorexia Nervosa, *Behavioural and Cognitive Psychotherapy*, 41, 3, 301-316. <http://doi.org/10.1017/S1352465812000847>
- Sternheim, L., Konstantellou, A., Startup, H., & Schmidt, N. B. (2011). What does uncertainty mean to women with anorexia nervosa? An interpretative phenomenological analysis. *European Eating Disorders Review*, 19, 12–24. <https://doi.org/10.1136/bmj.a288>
- Sternheim, L., Startup, H., & Schmidt, U. (2012). An experimental exploration of behavioral and cognitive-emotional aspects of intolerance of uncertainty in eating disorder patients. *Journal of Anxiety Disorders*, 25(6), 806–812. <https://doi.org/10.1016/j.janxdis.2011.03.020>
- Sternheim, L., Startup, H., & Schmidt, U. (2015). Anxiety-related processes in anorexia nervosa and their relation to eating disorder pathology, depression and anxiety. *Advances in Eating Disorders*, 3, 13–19. <https://doi.org/10.1080/21662630.2014.948469>
- Sternheim, L., Fisher, M., Harrison, A., & Watling, R. (2017). Predicting intolerance of uncertainty in individuals with eating disorder symptoms. *Journal of Eating Disorders*, 5, 26–35.

<https://doi.org/10.1186/s40337-017-0152-4>

Smink, F. R., van Hoeken, D., & Hoek, H. W. (2013) Epidemiology, course, and outcome of eating disorders. *Current Psychiatry Reports*, 26(6),543–8. <http://doi.org/10.1007/s11920-012-0282-y>

Stice, E., & Shaw, H. E. (2002). Role of body dissatisfaction and maintenance of eating pathology A synthesis of research findings. *Journal of Psychosomatic Research*, 53, 985-993

Swanson, S. A., Crow, S. J., Le Grange, D., Swendsen, J., & Merikangas, K. R. (2011). Prevalence and correlates of eating disorders in adolescents. Results from the national comorbidity survey replication adolescent supplement. *Archives of General Psychiatry*, 68(7), 714-23. <http://doi.org/10.1001/archgenpsychiatry.2011.22>

Vall, E., & Wade, T. D. (2015). Predictors of treatment outcome in individuals with eating disorders: A systematic review and meta-analysis. *International Journal of Eating Disorders*, 48(7), 946-971. <http://doi.org/10.1002/eat.22411>

Vasey, M. W., & Borkovec, T. D. (1992). A catastrophizing assessment of worrisome thoughts. *Cognitive Therapy and Research*, 16, 505-520. <http://doi.org/10.1007/BF01175138>

Wade, T. D., Byrne, S., & Bryant-Waugh, R. (2008). The eating disorder examination: norms and construct validity with young and middle adolescent girl. *International Journal of Eating Disorders*, 41, 551-558.

Watkins, E. (2004). Adaptive and maladaptive ruminative self-focus during emotional processing. *Behaviour Research and Therapy*, 42(9), 1037-1052. <http://doi.org/10.1016/j.brat.2004.01.009>

Winer, E. S., Cervone, D., Bryant, J., McKinney, C., Liu, R. T., & Nadorff, M. R. (2016). Distinguishing mediational models and analyses in clinical psychology: Atemporal associations do not imply causation. *Journal of Clinical Psychology*, 72, 947–955. <http://dx.doi.org/10.1002/jclp.2229>

Wildes, J. E., Ringham, R. M., & Marcus, M. (2010). Emotion Avoidance in Patients with Anorexia Nervosa: Initial Test of a Functional Model. *International Journal of Eating Disorders*, 43(5), 398-404. <http://doi.org/10.1002/eat.20730>

Figures

Figure 1

Results of the regression analysis. Note. Inhibitory IU = Inhibitory intolerance of uncertainty; Prospective IU = prospective intolerance of uncertainty. Coefficients in parentheses represent total effects. Coefficients highlighted in bold are significant of $p < .01$, when controlling for age of onset, duration of illness and BMI.