

**‘I’m uncertain: what should I do?’: An investigation of behavioral responses to everyday
life uncertain situations**

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Abstract

People might employ unhelpful coping strategies to manage uncertainty, such as over-engagement, under-engagement, and impulsive behaviors. The current study explored the association between prospective and inhibitory intolerance of uncertainty (IU), negative urgency (NU), worry, and behavioral responses to everyday life uncertain situations.

A sample comprising 130 undergraduates completed self-report measures assessing the above-mentioned constructs and general distress; among them, 69 underwent an *in vivo* uncertainty induction and then evaluated different strategies they might use to manage the personally relevant uncertain situation they described.

In the total sample, both IU dimensions, worry, and NU were positively correlated with general distress, whereas NU was not correlated with any of the IU dimensions nor with worry. In participants who underwent the uncertainty induction, inhibitory IU positively predicted the use of under-engagement strategies and negatively predicted the use of over-engagement ones. Furthermore, prospective IU and worry positively predicted over-engagement behaviors. Only NU positively predicted the use of impulsive behaviors,

Current findings support the differential role played by the IU dimensions in promoting the use of dysfunctional behaviors under uncertain circumstances. Furthermore, the lack of association between IU and impulsivity claims for further research considering cross-cultural issues.

Key words: intolerance of uncertainty; impulsivity; behaviors; *in vivo* induction.

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Intolerance of uncertainty (IU) has been defined as the “individual’s dispositional incapacity to endure the aversive response triggered by the perceived absence of salient, key, or sufficient information, and sustained by the associated perception of uncertainty” (Carleton, 2016b, p.31). Beyond representing a cognitive vulnerability factor for worry and generalized anxiety disorder (GAD) (Bottesi et al., 2016; Dugas, Gagnon, Ladouceur, & Freeston, 1998; Koerner & Dugas, 2008), recent evidence highlights the trans-diagnostic nature of IU, since the incapacity to tolerate the unknown is a dispositional feature associated with several dysfunctional behaviors and with a range of emotional disorders, especially anxiety, obsessive-compulsive, and depressive ones (e.g. Carleton, 2016a; Hong, & Cheung, 2015; Shihata, McEvoy, Mullan, & Carleton, 2016).

IU produces cognitive, emotional, and behavioral reactions to uncertain situations (Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994). When dealing with uncertainty, individuals high in IU usually negatively interpret it, endorse negative beliefs about their ability to cope with it, and experience negative emotions (Buhr & Dugas, 2002; Carleton et al., 2012; Dugas, Schwartz, & Francis, 2004). IU causes distress, and individuals high in IU are unable to tolerate and modulate the negative affect triggered by uncertain situations: rather, they are likely to perform maladaptive behaviors in the attempt to control or avoid uncertainty (Cogle, Timpano, & Goetz, 2012; Mennin, Heimberg, Turk, & Fresco, 2005; Pawluk & Koerner, 2013).

Behavioral responses to uncertainty

Extant literature supports the notion that people may employ poor coping strategies to manage uncertainty and its associated distress (Newmann & Llera, 2011; Pawluk &

Koerner, 2013). Recently, Sankar, Robinson, Honey, and Freeston (2017) identified five categories of unhelpful strategies that individuals may enact to face uncertainty: over-engagement behaviors, aiming to seek and gain certainty (e.g. excessive information seeking); under-engagement behaviors, referring to actions aimed to avoid future uncertain situations (e.g. distracting); impulsivity, consisting in the performance of behaviors to immediately eliminate uncertainty or its associated distress (e.g. making impulsive decisions); dither, which results in inaction due to hesitancy in choosing between two out of the three above-mentioned components; and flip-flop, which involves switching between seeking certainty and avoiding uncertainty and vice versa. Starting from the above-mentioned categories, a team of international experts on IU developed the *Intolerance of Uncertainty Behaviors in Everyday Life* (IUBEL), a questionnaire assessing different strategies that can be used in uncertain situations (Clifford et al., unpublished). With respect to the Italian version of the IUBEL, findings from an unpublished, preliminary exploratory factor analysis conducted on a sample of 334 community individuals revealed insufficient loadings for 5 items; all of them described strategies belonging to “dither” and “flip-flop”. On the contrary, the other items clearly loaded into one out of three factors, namely “under-engagement”, “over-engagement”, and “impulsivity”.

IU, NU, and behavioral responses to uncertainty

Previous research widely documented that IU comprises two main dimensions: prospective and inhibitory (e.g., Birrell, Meares, Wilkinson, & Freeston, 2011; Carleton, Norton, & Asmundson, 2007; Hong & Lee, 2015; McEvoy & Mahoney, 2011).

Prospective IU is intended as a future-oriented component aimed to increase certainty and action planning; inhibitory IU consists in feeling stuck or unable to function when facing

uncertainty, and its final goal is avoiding uncertainty. Conceptually, over-engagement behaviors are likely being particularly associated with prospective IU, whereas under-engagement behaviors are likely being specifically linked to inhibitory IU.

The association between uncertainty, IU, and negative urgency (NU), a component of impulsivity described as the tendency to act impulsively under conditions of negative affect (Whideside & Lynam, 2001), has been scarcely investigated to date. However, preliminary findings show that feeling uncertain might trigger impulsive behavior, with IU involved in this association (Luhmann, Ishida, & Hajcak, 2011; Pawluk & Koerner, 2013). More recently, Bottesi, Tesini, Cerea, and Ghisi (2018) explored the role of IU in patients with borderline personality disorder (BPD), a condition characterized by negative affect, poor emotion regulation (ER), and impulsive behavior. Beyond providing preliminary data supporting the involvement of IU in BPD, they posited that the association between IU and poor ER might bolster the tendency to act impulsively in response to negative affect (i.e., NU), thus ultimately fostering the adoption of impulsive behavior as a strategy to manage uncertainty (Bottesi et al., 2018). Importantly, the immediate termination of a sense of uncertainty and its associated discomfort may negatively reinforce impulsive coping (Luhmann et al. 2011; Pawluk & Koerner, 2013).

The current study

The current study was designed to further explore the association between dispositional characteristics (IU, NU, and worry) and behavioral responses to everyday life uncertain situations after an unstandardized *in vivo* uncertainty induction. We carried out our investigation on a sample of undergraduates, since literature claims that the use of analog samples is the most appropriate choice when aiming to gain a clearer understanding of psychological mechanisms underlying psychopathology (e.g. Abramowitz et al., 2014;

Bottesi et al., 2016). Moreover, a significant portion of the theoretical testing of IU has been conducted on undergraduate samples (e.g. Bottesi et al., 2016; Bottesi, Ghisi, Sica, & Freeston, 2017; Buhr & Dugas, 2002; Carleton et al., 2007; Freeston et al., 1994; Koerner & Dugas, 2008).

Specifically, we aimed to: 1) further investigate the association between IU, worry, and NU. Only a few empirical studies directly explored this issue: a medium-range correlation between IU and NU ($r = .31$) was observed in Canadian undergraduates (Pawluk & Koerner, 2013); similarly, moderate correlations between worry and NU in Swiss (Gay, Schmidt, & Van der Linden, 2011) and American (Cogle et al., 2012) undergraduates were reported (both $r_s = .32$). Therefore, according to literature, we expected to observe positive, medium-range associations between these constructs also in a sample of Italian undergraduate students; 2) further characterize the strategies people may adopt in everyday life uncertain situations using the IUBEL. This questionnaire was administered to a subgroup of participants, after they underwent an *in vivo* uncertainty induction; 3) explore the role of prospective and inhibitory IU, worry, and NU in predicting such behavioral responses to everyday life uncertain situations after an *in vivo* uncertainty induction. We used a design in which participants responded to uncertain situations that were idiosyncratic to them. To note, the few studies conducted to explicitly assess the behavioral correlates of IU usually employed gambling-like/decision making or vignette tasks to experimentally induce uncertainty (e.g., Carleton et al., 2016; Jacoby, Abramowitz, Reuman & Shannon, 2016; Koerner & Dugas, 2008; Ladouceur, Gosselin, & Dugas, 2000; Ladouceur, Talbot, & Dugas, 1997; Luhman et al., 2011). Nonetheless, although these paradigms are highly replicable, their ecological validity is questionable as they are likely not to consider “real world” implications and common daily behaviors

(Carleton et al., 2016; Shihata et al., 2016). From a theoretical standpoint, we expected that, in a context of uncertainty, inhibitory IU would strongly and positively predict under-engagement behaviors; prospective IU and worry would strongly and positively predict over-engagement behaviors; NU would strongly and positively predict impulsive behavior. Dither and flip-flop behaviors were not considered in this phase given their arguable construct validity.

Method

Participants

A sample comprising 130 Italian undergraduates (74.6% females), aged between 19 and 27 years ($M = 21.25$, $SD = 1.38$), voluntarily entered the study. As far as marital status is concerned, 98.5% were single or partners not in a domestic relationship. In the second phase of the study, participants were sub-grouped based on which induction they received (see paragraph 2.3): “uncertainty induction” (UI group; $N = 69$) and “negative affect induction” (NAI group; $N = 61$). As shown in Table 1, groups were comparable on demographics and on the main clinical variables (i.e., present or past psychiatric disorder; scores on the Depression Anxiety Stress Scales-21, Lovibond & Lovibond, 1995). [Table 1]

Measures

All participants completed a background information schedule collecting information about sex, age, education, marital status, and present or past psychiatric disorders. Furthermore, they completed the following self-report measures:

The *Intolerance of Uncertainty Behaviors in Everyday Life* (IUBEL; Clifford et al., unpublished; *ad hoc* Italian adaptation): a 24-item questionnaire evaluating different strategies that people may use in uncertain situations. Respondents have to rate how much

they use each strategy on a 5-point Likert scale ranging from 0 = “never” to 4 = “very frequently”. The IUBEL is a cross-culturally developed measure: items were originally phrased in English by a team of international experts on IU and then translated following the standard forward-back translation procedure (Brislin, 1986) into Italian and Spanish. To date, no information about the psychometric properties and the factor structure of the questionnaire are available in any language. Preliminary data from its Italian translation ($N = 334$ community individuals) revealed that internal consistency was adequate for the “under-engagement” and “over-engagement” scales ($\alpha = .76$ and $\alpha = .77$, respectively), sufficient for the “impulsivity” scale ($\alpha = .65$), and insufficient for the “dither” and “flip-flop” scales (both $\alpha s < .50$). By removing item 13 (“I’d rather do anything now than do nothing at all”) from the “impulsivity” scale, internal consistency became adequate ($\alpha = .74$). Scores on the “under-engagement”, “over-engagement”, and “impulsivity” scales were significantly and positively correlated with scores on measures of IU (Intolerance of Uncertainty Scale-12; Carleton et al., 2007), worry (Penn State Worry Questionnaire; Meyer, Miller, Metzger, & Borkovec, 1990), poor ER (Difficulties in Emotion Regulation Scale; Gratz & Roemer, 2004), and general distress (Depression Anxiety Stress Scales-21; Lovibond & Lovibond, 1995). Correlations ranged between $r = .21$ and $r = .51$. (unpublished data). In the current study, the 23-item Italian version of the IUBEL was administered only to the UI group ($N = 69$; see the “Procedure” section). The “under-engagement”, “over-engagement”, and “impulsivity” scales showed adequate internal consistency values ($\alpha = .70$, $\alpha = .74$, and $\alpha = .68$, respectively). Also in the case at hand, Cronbach’s alphas for the “dither” and “flip-flop” scales were insufficient (both $\alpha s = .55$).

The *Intolerance of Uncertainty Scale-12* (IUS-12; Carleton et al., 2007; Italian version by Bottesi et al., 2015b): a 12-item measure designed to assess the tendency to find

uncertainty upsetting and distressing. Respondents are asked to rate on a 5-point Likert scale the extent to which each statement applies to them. The IUS-12 demonstrated excellent internal consistency, convergent, and discriminant validity both in the original (Carleton et al., 2007; McEvoy & Mahoney, 2011) and in the Italian version (Bottesi et al., 2015b). In line with the aims of the current study, the prospective IU (IUS-12-P) and inhibitory IU (IUS-12-I) scales were used; in the current sample, their internal consistency values were good ($N = 130$; $\alpha = .73$ and $\alpha = .85$, respectively).

The *UPPS-P Impulsive Behavior Scale-Short Form* (S-UPPS-P; Billieux et al., 2012, Italian version by D'Orta et al., 2015): a 20-item inventory measuring 5 facets of impulsivity: positive urgency, NU, lack of premeditation, lack of perseverance, and sensation seeking. Respondents have to indicate the extent to which each statement is typical of them on a 4-point Likert scale. The original version (Billieux et al., 2012) showed good internal consistency as well as good construct validity and test-retest reliability. The Italian version of the S-UPPS-P also showed adequate psychometric properties (D'Orta et al., 2015). Given the purpose of the current study, only the NU scale was used; in the current sample, its internal consistency was adequate ($N = 130$; $\alpha = .70$).

The *Penn State Worry Questionnaire* (PSWQ; Meyer et al., 1990; Italian version by Morani, Pricci, & Sanavio, 1999): a 16-item questionnaire designed to measure the tendency to worry excessively and uncontrollably. Respondents are required to rate the extent to which each statement is typical of them on a 5-point Likert scale. Internal consistency and test-retest reliability of the PSWQ were good in non-clinical and clinical samples as well as convergent and divergent validity (Meyer et al., 1990). Psychometric properties of the Italian version were adequate as well (Morani et al., 1999); internal consistency in the current sample was excellent ($N = 130$; $\alpha = .94$).

The *Depression Anxiety Stress Scales-21* (DASS-21; Lovibond & Lovibond, 1995, Italian version by Bottesi et al., 2015a): a 21-item measure evaluating depression, anxiety, and stress over the previous week on a 4-point Likert scale. Good psychometric properties have been reported for the original version of the questionnaire (Lovibond & Lovibond, 1995). In the Italian validation, the use of the total score as a measure of general distress is encouraged; the total score showed excellent internal consistency values, good test-retest reliability, and adequate convergent and divergent validity (Bottesi et al., 2015a). In the current study, Cronbach's alpha for the total score was excellent ($N = 130$; $\alpha = .93$).

Procedure

The research was approved by the Ethics Committee of Psychological Sciences of the local university and was conducted in accordance with the Declaration of Helsinki. Participants were enrolled at the School of Psychology of the local university; they were informed about the main aims of the study by the Principal Investigator during their classes. Participants were guaranteed about the voluntary nature of their participation and their right to withdraw from the study at any time and without being penalized in any way. Furthermore, they were informed that the research would have consisted of two phases and that they would have been asked to provide their email address while completing Phase 1: this would have allowed researchers to contact them in order to (1) schedule their participation to Phase 2 and/or (2) plan a preliminary interview in case they would had obtained a z -score ≥ 1.96 on the DASS-21 (i.e., clinically significant levels of distress), aiming at evaluating whether their participation to Phase 2 was adequate.

Phase 1: Online administration. Before recruiting participants, a Google Drive account for the current research was created. The account included a link to a survey, which contained an informed consent form for the study participation, the background

information schedule, and the following self-report questionnaires: IUS-12, UPPS-P, PSWQ, and DASS-21. Participants completed the online survey once they had provided their online informed consent by clicking agreement.

Phase 2: *In vivo* uncertainty/negative affect induction. Phase 2 was conducted in the Experimental Psychopathology laboratory. Among participants, 31 obtained a z -score ≥ 1.96 on the DASS-21 and underwent the preliminary interview with the Principal Investigator, a Ph.D.-level psychologist trained in cognitive-behavioral assessment and treatment. If any psychological problems clearly emerged from the interview, the students concerned were offered intervention at specialized university centers free of charge. After each debrief, the Principal Investigator and each participant jointly agreed whether he/she would have entered Phase 2; all these 31 students were included. Participants were then randomly assigned to one out of the two experimental conditions, namely “uncertainty induction” Vs “negative affect induction”. In both conditions, participants were asked to think about a personally relevant situation, to write it down, and then to verbally describe it to the experimenters. The experimenters were two adequately trained clinical psychology students (1 undergraduate and 1 postgraduate).

Uncertainty induction. Participants included in the UI group received the following instructions: “Please, think about a situation you recently faced, in which the outcome was uncertain. An uncertain situation could have a positive, neutral or negative outcome but it has not happened yet. You do not know yet what will happen in this situation. For example, one of your professors asked to meet you, but do not know why; or: you are waiting for a person you really care to give you information about an important medical exam she/he has been through; or: you are waiting for your friend to get back to you to let

you know if he/she is willing to take the room that you plan to rent together. Describe your own situation with an uncertain outcome”.

Negative affect induction. Participants included in the NAI group received the following instructions: “Please, think about a situation you recently faced, in which the outcome was certain and negative. For example, one of your professors asked to meet you to inform that your final exam has been postponed (which is not what you were hoping for); or: a person you really care about informed you that the important medical exam he/she had been through, had a bad result; or: a friend of yours, who you were willing to share a room with, decided he/she will not take it anymore. Describe your own situation with a negative outcome”.

Prior and after the *in vivo* induction, participants were administered 4 Visual Analogue Scales (VASs) in order to evaluate their emotional state. The 4 VASs assessed the following: “uncertain (0) – certain (10)”; “sad (0) – happy (10)”; “worried (0) – calm (10)”; “frustrated (0) – satisfied (10)”. Each VAS consisted of a 100 mm line and participants were required to mark the point that better fitted with the emotional state they were experiencing. Furthermore, participants in the UI group were asked to complete the IUBEL after the uncertainty induction, by making specific reference to the situation they had just described. Overall, the *in vivo* induction lasted about 30 minutes. At the end of Phase 2, all participants were debriefed and exhaustive details about the aims of the study were provided.

Statistical analyses

All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) software version 23. Before performing analyses, all measures were tested for univariate and multivariate normality, and the distributions of all continuous data

were examined. Distributions on measures were judged normal according to figures of skewness and kurtosis. Overall, scores were normally distributed, with all items indicating acceptable levels of skewness and kurtosis (≤ 1). Internal consistency of all the study measures was assessed by computing Cronbach's alphas (α) coefficients.

To examine the association among the study measures in the whole sample ($N = 130$), Pearson's correlations were computed. Following Cohen's (1988) classification, large correlations were defined as $r = .50$ and above, medium correlations as $.30 < r < .49$, and small correlations as $.10 < r < .29$.

In order to characterize the behavioral responses to everyday life uncertain situations, answers to each of the IUBEL items provided by participants of the UI group ($N = 69$) were analyzed. Specifically, in order to explore the frequency of use for each of the depicted strategies, percentages of individuals answering "Never/Rarely", "Sometimes", and "Often/Very frequently" after the uncertainty induction were calculated. Importantly, as a manipulation check and supporting the validity of the uncertainty induction, a series of 2 (Group: UI Vs NAI) \times 2 (Time) repeated measure Analyses of Variance (ANOVAs), where the emotional state measured through the VAS (pre- and post-induction) was the within-group factor, were performed. Given the purposes of the study, only findings about the "uncertain-certain" VAS are presented.

Lastly, to investigate the role of prospective IU, inhibitory IU, worry, and NU in predicting behavioral responses to everyday life uncertain situations, 3 stepwise hierarchical multiple regression analyses were conducted in the UI group. In all models, prospective IU and inhibitory IU were entered in the first step, the PSWQ was entered in the second step, whereas the third step included the S-UPPS-P NU. The dependent

variables were, in turn, all the IUBEL scales apart from the “dither” and “flip-flop” scales, given their questionable validity and reliability¹.

A priori power analyses were conducted using G*Power 3 (Faul, Erdfelder, Lang, & Buchner, 2007) to determine the necessary sample sizes. It was estimated that a sample size of (minimum) 82 participants was required to achieve a power 0.8 (alpha level = .05) if the size of the correlation was at least medium ($r = .30$). Furthermore, it was estimated that a sample size of (minimum) 55 was required to achieve a power 0.8 (alpha level = .05) for a linear multiple regression analysis with 4 predictors, if effect sizes were at least moderate ($f^2 = .15$).

Results

Associations between IU, worry, NU, and general distress

The IUS-12-P, IUS-12-I, and PSWQ were strongly positively correlated, whereas medium-range positive correlations between the IUS-12-I and the DASS-21 and between the PSWQ and the DASS-21 emerged. Furthermore, the IUS-12-P and the S-UPPS-P NU were weakly positively correlated with the DASS-21. No significant correlations between both the IU scales and the S-UPPS-P NU were observed; similarly, the PSWQ was not correlated with the S-UPPS-P NU (Table 2). [Table 2].

Characterization of the Intolerance of Uncertainty Behaviors in Everyday Life

Manipulation check. As far as the “uncertain–certain” VAS is concerned, findings from the 2 (Group) \times 2 (Time) repeated measure ANOVA highlighted a significant main effect of Time ($F_{(1,128)} = 62.78$; $p < .001$), whereas no main effect of Group was observed ($F_{(1,128)} = .03$; $p = .87$). Importantly, a significant Group \times Time interaction emerged ($F_{(1,128)} = 6.88$; $p = .01$): participants in the IU group exhibited a significantly larger

¹ Scores on the DASS-21 were not included as control variable since no correlation with any of the IUBEL scales emerged.

decrease in certainty after their induction (pre-induction: $M = 5.90 \pm 2.10$; post-induction: $M = 3.67 \pm 2.37$) when compared to those in the NAI group (pre-induction: $M = 5.29 \pm 2.03$; post-induction: $M = 4.17 \pm 2.30$).

Frequency of use for each of the IUBEL strategies. Table 3 displays the percentages of answers to each item of the 23 items of the IUBEL provided by participants who underwent the uncertainty induction (UI group). [Table 3]

As it appears, more than 50% of participants rated that they would have “often/very frequently” used 5 out of the 9 over-engagement strategies in order to manage their personally relevant uncertain situation. On the contrary, more than 65% of participants declared they would have “never/rarely” performed impulsive behaviors. Among the other categories, distraction (“under-engagement” category) and monitoring the situation without acting until it is mandatory (“dither”/ “flip-flop” categories) were rated as the strategies most likely to be performed.

Predictors of behavioral responses to everyday life uncertain situations

“Under-engagement”. The first regression model overall accounted for the 32.7% of variance in the IUBEL “under-engagement” scale (see Table 4). The inclusion of the IUS-12-P and the IUS-12-I in the first step accounted for the 28.9% of variance ($p < .001$). Entering the PSWQ in step two explained an additional 5.6% of variance ($p = .02$). Lastly, the inclusion of the S-UPPS-P NU in the third step accounted for an additional 2.3% of explained variance, but this increase was not significant ($p = .14$). Overall, the only significant, positive predictor of the IUBEL “under-engagement” scale was the IUS-12-I ($p < .001$). [Table 4]

“Over-engagement”. The second regression model overall accounted for the 13.8% of variance in the IUBEL “over-engagement” scale (see Table 5). Entering the IUS-

12-P and the IUS-12-I in the first step explained the 12.1% of variance ($p = .01$). The inclusion of the PSWQ in the second step accounted for an additional 6.8% of explained variance ($p = .02$). Finally, entering the S-UPPS-P NU in the third step did not account for any additional explained variance ($p = .88$). The IUS-12-P ($p = .007$) and the PSWQ ($p = .03$), emerged as significant positive predictors, whereas the IUS-12-I was a significant negative predictor ($p = .005$). [Table 5]

“Impulsivity”. The last regression model overall accounted for only the 3.2% of variance in the IUBEL “impulsivity” scale (see Table 6). The inclusion of the IUS-12-P and the IUS-12-I in the first step accounted for the 0.7% of the variance but their joint contribution was not significant ($p = .79$). Entering the PSWQ in the second step did not account for additional explained variance ($p = .97$). Lastly, the inclusion of the S-UPPS-P NU in the third step explained the 8.2% of variance ($p = .02$). Therefore, the only significant and positive predictor of the IUBEL “impulsivity” scale was the S-UPPS-P NU ($p = .02$). [Table 6]

Discussion

The current study sought to shed light on the relationship between IU, worry, NU, and general distress, as well as on the role of prospective and inhibitory IU, worry and NU in predicting behavioral responses to everyday life uncertain situations. The way the above-mentioned dispositional characteristics relate to common daily behaviors is still an open issue, and research in this field is highly encouraged (e.g., Shihata et al., 2016).

Correlation analyses on the total sample revealed that both IU dimensions, worry, and NU are associated with general distress. Such findings further demonstrate the established association between distress and these constructs across different samples (e.g., Gentes & Ruscio, 2011; McEvoy & Erceg-Hurn, 2016; Whiteside & Lynam, 2001; Yook,

Kim, Suh, & Lee, 2010). On the contrary, neither the IU dimensions nor dispositional worry emerged as related to NU. Such a finding does not replicate past findings, since strong associations between worry, anxiety symptoms, and NU have been reported (e.g., Cogle et al., 2012; Gay et al., 2011; Miller, Flory, Lynam, & Leukefeld, 2003).

Furthermore, the relationship between IU and impulsivity in non-clinical samples has been documented: for example, Luhmann et al. (2011) observed that, in North American undergraduates, high levels of IU predicted shorter wait time and poor decision making (a preference for smaller immediate rewards over larger distal rewards) in an experimental task. According to the authors, a long period of uncertainty can be interpreted as aversive and impulsive decision making can be seen as avoidance of distress (Carleton et al., 2016; Luhmann et al., 2011). Similarly, Pawluk and Koerner (2013) reported a moderate positive association between self-reported levels of IU and NU in a sample of Canadian undergraduates. Perhaps some cultural factors may have played a role in determining current results: indeed, cross-cultural differences have been claimed to intervene in the interpretation of uncertainty (see Bottesi et al., 2016). To note, this discrepancy might also be explained by measurement issues. In their study, Pawluk and Koerner (2013) used the original 27-item IUS (Freeston et al., 1994); importantly, literature suggest that the validity of the original IUS is questionable, given the “GAD-specific” nature of some of its items (e.g., Carleton et al., 2012; Gentes & Ruscio, 2011). On the contrary, in the current study we used the IUS-12, which is claimed to adequately capture the core IU construct and it does allow to separately measure prospective and inhibitory IU (Carleton et al., 2007). However, the high content validity of these two scales (further supported by current regression results) might have hindered the possibility to detect associations with more broadly related constructs, such as NU.

Findings from regression analyses suggest that the IU dimensions are differentially related to behavior. In line with our expectations, inhibitory IU positively predicted under-engagement strategies and negatively predicted over-engagement ones. Furthermore, prospective IU and worry positively predicted over-engagement behaviors. These results provide preliminary evidence about content validity of the categorization proposed by Sankar et al. (2017), as well about construct validity of the IUBEL. Furthermore, they confirm the differential role played by the IU dimensions in promoting the use of dysfunctional behaviors under uncertain circumstances, consistently with conceptualizations of IU as a trans-diagnostic process. As a matter of fact, previous literature demonstrated that these dimensions have differential discriminant validity, such that prospective IU is strongly linked with GAD and obsessive-compulsive disorder (i.e., use of approach behaviors to prevent future uncertainty; over-engagement) and inhibitory IU is strongly associated with panic disorder, social anxiety, and depression (i.e. relying on avoidance behaviors to reduce exposure to uncertainty; under-engagement) (see Birrell et al., 2011; Carleton, Collimore, & Asmundson, 2010; McEvoy & Mahoney, 2011).

Only NU positively predicted the endorsement of impulsive behavior under uncertain circumstances, a result suggesting that impulsive behavior might be enacted to manage uncertainty in common daily situations. On the contrary, no association between IU and impulsivity emerged. These results may reflect the previously mentioned issues about IU measurement, but most importantly about cultural factors. Literature suggest that, depending on their cultural background, individuals might differently engage with uncertainty at the level of IU core beliefs (see, for example, Lauriola et al., 2018). In this regard, Italian culture is listed among the “strong uncertainty avoidance cultures” (Stremersch & Tellis, 2004; Wennekers, Thurik, van Stel, & Noorderhaven, 2007), and “in

uncertainty avoidant cultures, risk taking is limited to known risks (of which the probability is known)” (Stremersch & Tellis, 2004, p. 426). Therefore, it is reasonable to assume that people with this cultural background are risk avoidant, resistant to change and, consequently, less prone to endorse impulsive behavior to manage everyday life uncertain situations regardless of IU levels. Further support to this interpretation comes from the analysis of the frequency of use for each of the IUBEL strategies: only a small number of participants selected impulsive behaviors to manage uncertainty. As a whole, these data tentatively suggest that also Italian people might endorse impulsive coping to manage uncertainty, but these impulsive behaviors are likely performed independently from levels of IU.

Although the current study introduces promising hints in the understanding of the mechanisms underlying behavioral responses to uncertain situations, its limitations must be considered before any conclusions can be made. First of all, caution is needed in generalizing the findings due to potentially low statistical power. Despite the fact that our sample sizes exceeded the minimum size recommended by a priori power analysis, we acknowledge that the number of participants who underwent the uncertainty induction is still rather low. Therefore, results from regressions should be interpreted with caution because of the possibility of sampling errors. The cross-sectional nature of the design does not allow for causal inferences; only longitudinal research might provide reliable findings about casual relations between constructs. Furthermore, the current study design lacked the inclusion of a control group. The NAI condition was included exclusively to test the specificity of the uncertainty induction (i.e., manipulation check). Indeed, we could not ask to individuals in the NAI group to complete the IUBEL after their induction, because completing the IUBEL by referring to a negative, certain event rather than to an uncertain

situation would have led to problems related to the internal validity of the study. Future studies including behavioral and/or observational, rather than self-report, measures of IU behaviors would help further addressing this relevant issue, thus clarifying whether uncertainty (vs. negativity) can be intended as the context for IU leading to specific coping strategies. Importantly, the *in vivo* uncertainty induction we adopted is an unstandardized, and thus by definition scarcely replicable, procedure. In our opinion, focusing on specific idiosyncratic concerns represents a suitable and highly ecological method to gain personally relevant information about emotional responding; however, we acknowledge that subjectivity prevents generalization of findings. Moreover, we cannot guarantee neither that participants selected real and personally relevant situations, nor that the behavioral responses they had to rate effectively corresponded to the real actions they would have performed to manage uncertainty. Lastly, the IUBEL is a questionnaire still lacking a proper validation, and in the current study we could not evaluate the “dither” and “flip-flop” scales due to their poor psychometric properties. These considerations advocate the need for more information about its factor structure, reliability and validity, taking into account cross-cultural implications.

In conclusion, notwithstanding the acknowledged shortcomings, we believe that current findings underscore the need to explore the putative role of IU and related processes on behavioral responses to everyday life uncertain situations. Current results provide preliminary additional evidence to the concept of IU as a trans-diagnostic process, independent from the presence of specific clinical conditions. Furthermore, they suggest that uncertainty behaviors in everyday life are specific to IU rather than worry. Lastly, current findings highlight the crucial role of cultural background in influencing phenomenological expressions.

Since behavioral responses to uncertainty are hypothesized to span emotional disorders, focusing on idiosyncratic behavioral responses to uncertain situations in a non-clinical sample might allow identifying “disorder-free” mechanisms potentially underlying different clinical phenotypes by adopting a dimensional perspective. This approach will help further clarifying which high-level cognitive processes underlie different disorders, shaping phenomenological commonalities and determining high comorbidity rates. As a final implication, expanding extant theoretical models would inform the development and implementation of common treatment strategies (i.e., unified protocols).

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References

- Abramowitz, J. S., Fabricant, L. E., Taylor, S., Deacon, B. J., McKay, D., & Storch, E. A. (2014). The relevance of analogue studies for understanding obsessions and compulsions. *Clinical Psychology Review, 34*, 206–217.
<https://doi.org/10.1016/j.cpr.2014.01.004>.
- Billieux, J., Rochat, L., Ceschi, G., Carré, A., Offerlin-Meyer, I., Defeldre, A. C., ... & Van der Linden, M. (2012). Validation of a short French version of the UPPS-P Impulsive Behavior Scale. *Comprehensive Psychiatry, 53*, 609-615.
<https://doi.org/10.1016/j.comppsy.2011.09.001>.
- Birrell, J., Meares, K., Wilkinson, A., & Freeston, M. (2011). Toward a definition of intolerance of uncertainty: A review of factor analytical studies of the Intolerance of Uncertainty Scale. *Clinical Psychology Review, 31*, 1198-1208.
<https://doi.org/10.1016/j.cpr.2011.07.009>.
- Bottesi, G., Ghisi, M., Carraro, E., Barclay, N., Payne, R. & Freeston, M. H. (2016). Revising the Intolerance of Uncertainty Model of Generalized Anxiety Disorder: Evidence from UK and Italian undergraduate samples. *Frontiers in Psychology 7:1723*. <https://doi.org/10.3389/fpsyg.2016.01723>.
- Bottesi, G., Ghisi, M., Altoè, G., Conforti, E., Melli, G., & Sica, C. (2015a). The Italian version of the Depression Anxiety Stress Scales-21: Factor structure and psychometric properties on community and clinical samples. *Comprehensive Psychiatry, 60*, 170-181. <https://doi.org/10.1016/j.comppsy.2015.04.005>.
- Bottesi, G., Ghisi, M., Novara, C., Bertocchi, J., Boido, M., De Dominicis, I., & Freeston, M. H. (2015b). Intolerance of Uncertainty Scale (IUS-27 e IUS-12): due studi

preliminari. *Italian Journal of Cognitive and Behavioural Psychotherapy*, 21, 345-365.

Bottesi G., Ghisi M., Sica, C., & Freeston, M. H. (2017). Intolerance of Uncertainty, Not Just Right Experiences, and Compulsive Checking: Test of a Moderated Mediation Model on a Non-Clinical Sample. *Comprehensive Psychiatry*, 73, 111-119.
<https://doi.org/10.1016/j.comppsy.2016.11.014>.

Bottesi, G., Tesini, V., Cerea, S., & Ghisi, M. (2018). Are Difficulties in Emotion Regulation and Intolerance of Uncertainty related to negative affect in Borderline Personality Disorder? *Clinical Psychologist*, 22(2),137-147.
<https://doi.org/10.1111/cp.12163>.

Brislin, R. W. (1986). The wording and translation of research instruments. In W. J. Lonner and J. W. Berry (Eds.), *Field Methods in Cross-Cultural Research*. Beverly Hills, CA: Sage.

Buhr, K., & Dugas, M.J. (2002). The Intolerance of Uncertainty Scale: Psychometric properties of the English version. *Behaviour Research and Therapy*, 40, 931-945.
[https://doi.org/10.1016/S0005-7967\(01\)00092-4](https://doi.org/10.1016/S0005-7967(01)00092-4).

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., Collimore, K. C., & Asmundson, G. J. G. (2010). “It’s not just the judgements – It’s that I don’t know”: intolerance of uncertainty as a predictor of social

anxiety. *Journal of Anxiety Disorders*, 24, 189–195.

<https://doi.org/10.1016/j.janxdis.2009.10.007>.

Carleton, R. N., Duranceau, S., Shulman, E. P., Zerff, M., Gonzales, J., & Mishra, S. (2016). Self-reported intolerance of uncertainty and behavioural decisions. *Journal of Behavior Therapy and Experimental Psychiatry*, 51, 58-65.
<https://doi.org/10.1016/j.jbtep.2015.12.004>.

Carleton, R. N., Mulvogue, M. K., Thibodeau, M. A., McCabe, R. E., Antony, M. M., & Asmundson, G. J. (2012). Increasingly certain about uncertainty: Intolerance of uncertainty across anxiety and depression. *Journal of Anxiety Disorders*, 26, 468-479.
<https://doi.org/10.1016/j.janxdis.2012.01.011>.

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. <https://doi.org/10.1016/j.janxdis.2006.03.014>.

Clifford, M., Hardcastle, R., Lambert, E., Beckwith, H., Bottesi, G., Wilkins, F., Mclean, F., & Freeston M. H. (unpublished). *Development of a measure of Intolerance of Uncertainty Behaviours in Everyday Life (IUBEL)*. Technical report available from mark.freeston@ncl.uk, Newcastle University.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences (2nd ed.)*. Hillsdale, NJ: Erlbaum.

Cogle, J. R., Timpano, K. R., & Goetz, A. R. (2012). Exploring unique and interactive roles of distress tolerance and negative urgency in obsessions. *Personality and Individual Differences*, 52, 515–520. <https://doi.org/10.1016/j.paid.2011.11.017>

D'Orta, I., Burnay, J., Aiello, D., Niolu, C., Siracusano, A. Timpanaro, L., Khazaal, Y., & Billieux, J. (2015). Development and validation of a short Italian UPPS-P Impulsive

Behavior Scale. *Addictive Behaviors Reports*, 2, 19–22.

<https://doi.org/10.1016/j.abrep.2015.04.003>.

Dugas, M. J., Gagnon, F., Ladoceur, R., & Freeston, M. H. (1998). Generalized anxiety disorder: a preliminary test of a conceptual model. *Behaviour Research and Therapy*, 36, 215–226. [https://doi.org/10.1016/S0005-7967\(97\)00070-3](https://doi.org/10.1016/S0005-7967(97)00070-3).

Dugas, M. J., Schwartz, A., & Francis, K. (2004). Intolerance of uncertainty, worry, and depression. *Cognitive Therapy and Research*, 28, 835–842. <https://doi.org/10.1007/s10608-004-0669-0>.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39, 175–191. <https://doi.org/10.3758/BF03193146>,

Freeston, M. H., 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).

Gay, P., Schmidt, R. E., & Van der Linden, M. (2011). Impulsivity and intrusive thoughts: Related manifestations of self-control difficulties? *Cognitive Therapy and Research*, 35, 293–303. <https://doi.org/10.1007/s10608-010-9317-z>.

Gentes, E. L. & Ruscio, A. M. (2011). A meta-analysis of the relation of intolerance of uncertainty to symptoms of generalized anxiety disorder, major depressive disorder, and obsessive-compulsive disorder. *Clinical Psychology Review*, 31, 923–933. <https://doi.org/10.1016/j.cpr.2011.05.001>.

Gratz, K. L., & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the

- difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*, 26, 41-54. <https://doi.org/10.1023/B:JOBA.0000007455.08539.94>.
- Hong, R. Y., & Cheung, M. W. L. (2015). The Structure of Cognitive Vulnerabilities to Depression and Anxiety: Evidence for a Common Core Etiologic Process Based on a Meta-Analytic Review. *Clinical Psychological Science*, 3, 892-912. <https://doi.org/10.1177/2167702614553789>.
- Hong, R. Y., & Lee, S. S. (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, 605-620. <https://doi.org/10.1037/pas0000074>.
- Koerner, N., & Dugas, M. J. (2008). An investigation of appraisals in individuals vulnerable to excessive worry: the role of intolerance of uncertainty. *Cognitive Research Therapy*, 32, 619-638. <https://doi.org/10.1007/s10608-007-9125-2>.
- Jacoby, R. J., Abramowitz, J. S., Reuman, L., & Blakey, S. M. (2016). Enhancing the ecological validity of the Beads Task as a behavioral measure of intolerance of uncertainty. *Journal of Anxiety Disorders*, 41, 43-49. <https://doi.org/10.1016/j.janxdis.2016.02.003>.
- 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. [https://doi.org/10.1016/S0005-7967\(99\)00133-3](https://doi.org/10.1016/S0005-7967(99)00133-3).
- Ladouceur, R., Talbot, F., & Dugas, M. J. (1997). Behavioral expressions of intolerance of uncertainty in worry: Experimental findings. *Behavior Modification*, 21, 355-371. <https://doi.org/10.1177/01454455970213006>.

- Lauriola, M., Mosca, O., Trentini, C., Foschi, R., Tambelli, R., & Carleton, R. N. (2018). The Intolerance of Uncertainty Inventory: Validity and Comparison of Scoring Methods to Assess Individuals Screening Positive for Anxiety and Depression. *Frontiers in Psychology, 9*:388. <https://doi.org/10.3389/fpsyg.2018.00388>.
- Lovibond, S. H., & Lovibond, P. F. (1995). *Manual for the Depression Anxiety Stress Scales*, 2nd Edn. Sydney, NSW: Psychology Foundation.
- Luhmann, C. C., Ishida, K., & Hajcak, G. (2011). Intolerance of uncertainty and decisions about delayed, probabilistic rewards. *Behavior Therapy, 42*, 378–386. <https://doi.org/10.1016/j.beth.2010.09.002>.
- McEvoy, P. M., & Erceg-Hurn, D. M. (2016). The search for universal transdiagnostic and trans-therapy change processes: Evidence for intolerance of uncertainty. *Journal of Anxiety Disorders, 41*, 96-107. <https://doi.org/10.1016/j.janxdis.2016.02.002>.
- McEvoy, P., & 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>.
- Miller, J., Flory, K., Lynam, D., & Leukefeld, C. (2003). A test of the four-factor model of impulsivity-related traits. *Personality and Individual Differences, 34*, 1403–1418. [https://doi.org/10.1016/S0191-8869\(02\)00122-8](https://doi.org/10.1016/S0191-8869(02)00122-8).
- Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2005). Preliminary evidence for an emotion dysregulation model of generalized anxiety disorder. *Behaviour Research and Therapy, 43*, 1281–1310. <https://doi.org/10.1016/j.brat.2004.08.008>.

- 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, 487–495. [https://doi.org/10.1016/0005-7967\(90\)90135-6](https://doi.org/10.1016/0005-7967(90)90135-6).
- Morani, S., Pricci, D., & Sanavio, E. (1999). Penn State Worry Questionnaire e Worry Domains Questionnaire. Presentazione delle versioni italiane ed analisi della fedeltà. *Italian Journal of Cognitive and Behavioural Psychotherapy*, 5, 195–209.
- Newman, M. G., & Llera, S. J. (2011). A novel theory of experiential avoidance in generalized anxiety disorder: A review and synthesis of research supporting a contrast avoidance model of worry. *Clinical Psychology Review*, 31, 371–382. <https://doi.org/10.1016/j.cpr.2011.01.008>.
- Pawluk, E. J., & Koerner, N. (2013). A preliminary investigation of impulsivity in generalized anxiety disorder. *Personality and Individual Differences*, 54, 732–737. <https://doi.org/10.1016/j.paid.2012.11.027>.
- Sankar, R., Robinson, L., Honey, E., & Freeston, M. H. (2017) ‘We know intolerance of uncertainty is a transdiagnostic factor but we don’t know what it looks like in everyday life’: A systematic review of intolerance of uncertainty behaviours. *Clinical Psychology Forum*, 296, 10-15.
- Shihata, S., McEvoy, P. M., Mullan, B. A., & Carleton, R. N. (2016). Intolerance of uncertainty in emotional disorders: What uncertainties remain? *Journal of Anxiety Disorders*, 41, 115-124. <https://doi.org/10.1016/j.janxdis.2016.05.001>.
- Stremersch, S., & Tellis, G. J. (2004). Understanding and managing international growth of new products. *International Journal of Research in Marketing*, 21, 421–438. <https://doi.org/10.1016/j.ijresmar.2004.07.001>

- Wennekers, S., Thurik, R., van Stel, A., & Noorderhaven, N. (2007). Uncertainty avoidance and the rate of business ownership across 21 OECD countries, 1976–2004. *Journal of Evolutionary Economics*, *17*, 133–160. <https://doi.org/10.1007/s00191-006-0045-1>
- Whiteside, S. P., & Lynam, D. R. (2001). The five factor model and impulsivity: Using a structural model of personality to understand impulsivity. *Personality and Individual Differences*, *30*(4), 669-689. [https://doi.org/10.1016/S0191-8869\(00\)00064-7](https://doi.org/10.1016/S0191-8869(00)00064-7)
- Yook, K., Kim, K. H., Suh, S. Y., & Lee, K. S. (2010). Intolerance of uncertainty, worry, and rumination in major depressive disorder and generalized anxiety disorder. *Journal of Anxiety Disorders*, *24*, 623-628. <https://doi.org/10.1016/j.janxdis.2010.04.003>.

Table 1. *Main demographics and clinical characteristics of the two groups.*

	UI group	NAI group	F/χ^2	p
Sex (% female)	73.9	75.4	.04	.85
Age ($M \pm SD$)	21.20±1.46	21.31±1.29	.20	.66
Education ($M \pm SD$)	13.65±1.38	13.69±1.43	.02	.88
Marital status (% single)	97.1	100.0	1.80	.18
Psychiatric disorder (%)	20.3	31.2	2.02	.16
DASS-21 ($M \pm SD$)	19.86±10.72	19.54±11.66	.03	.87

Note: DASS-21 = Depression Anxiety Stress Scale-21.

Table 2. *Pearson's correlations between measures in the total sample (N = 130).*

	IUS-12-I	S-UPPS-P NU	DASS-21	PSWQ
IUS-12-P	.63**	.03	.21*	.50**
IUS-12-I		.03	.41**	.57**
S-UPPS-P NU			.26**	-.05
DASS-21				.49**

Note: * = $p < .05$; ** = $p < .01$; IUS-12-P = Prospective Intolerance of Uncertainty; IUS-12-I = Inhibitory Intolerance of Uncertainty; S-UPPS-P NU = UPPS-S Impulsive Behavior Scale-Short Form Negative Urgency; DASS-21 = Depression Anxiety Stress Scale-21.

Table 3. Percentages of answers to each item of the IUBEL provided by participants of the UI group (N = 69)

	Never/ Rarely	Sometimes	Often/ Very frequently
<i>Under-engagement</i>			
1) I just give up	58	33.3	8.7
4) I keep away from anything that will remind me of the situation, or force me to deal with it	55.1	31.9	13
9) I distract myself from the situation by doing various other things	29.4	32.4	38.2
12) I put off thinking about it until later	62.3	24.7	13
20) I try and ignore the situation	72.5	17.4	10.1
21) I put off doing something about it until the last minute	55.1	30.5	14.4
<i>Over-engagement</i>			
2) I run through everything I know about the situation again and again	11.6	31.9	56.5
3) I plan everything in great detail	17.6	30.9	51.5
8) I have back-up plans or a fall back strategy	20.3	30.4	49.3
11) I become a control freak	65.2	20.3	14.5
14) I prepare myself for all eventualities	13.0	23.2	63.8
16) I constantly reassure myself about the situation	17.4	42.1	40.5
18) I churn the situation over and over in my mind	20.3	27.6	52.1
23) I focus completely on the situation to the exclusion of all other things	60.9	21.8	17.3
24) I find out as much as I can about the situation (internet, family, friends, professional services)	8.7	21.7	69.6
<i>Impulsivity</i>			
6) I get sick of thinking about the situation and make an impulsive decision to be done with it	68.1	23.2	8.7
10) I do the first thing that comes into my mind to get it out to the way	76.8	17.5	5.7
19) I make a quick decision, even though I know it may not be the best course of action	79.7	11.7	8.6
<i>Dither/Flip-flop</i>			
5) I know what to do but wait until the time is right to take action	24.6	36.3	39.1
7) I track the situation but don't act until I have to	23.2	36.2	40.6
15) I make a plan and start to do something, then stop	58.0	26.1	15.9
17) I approach the situation half-heartedly or in a roundabout way	87.0	8.7	4.3
22) I keep a constant eye on the situation without doing anything about it	59.4	33.4	7.2

Table 4. Stepwise hierarchical multiple regression, dependent variable = IUBEL “Under-engagement” scale. ($N = 69$).

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	ΔR^2	<i>F</i>	<i>df1</i>	<i>df2</i>
					.289***	13.38	2	66
(Constant)	5.30	1.85		2.86				
IUS-12-P	-.21	.13	-.23	-1.66				
IUS-12-I	.67	.14	.66	4.78***				
					.056*	5.55	1	65
(Constant)	7.22	1.97		3.67				
IUS-12-P	-.18	.12	-.19	-1.41				
IUS-12-I	.85	.16	.83	5.46***				
PSWQ	-.10	.04	-.31	-2.36*				
					.023	2.28	1	64
(Constant)	5.09	2.41		2.11				
IUS-12-P	-.20	.12	-.22	-1.61				
IUS-12-I	.83	.15	.82	5.41***				
PSWQ	-.09	.04	-.27	-1.99				
S-UPPS-P NU	.25	.17	.16	1.51				

Note: $R^2 = .367$; adjusted $R^2 = .327$. * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

IUS-12-P = Prospective Intolerance of Uncertainty; IUS-12-I = Inhibitory Intolerance of Uncertainty PSWQ = Penn State Worry Questionnaire; S-UPPS-P NU = UPPS-S Impulsive Behavior Scale-Short Form Negative Urgency.

Table 5. Stepwise hierarchical multiple regression, dependent variable = IUBEL “Over-engagement” scale. ($N = 69$).

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	ΔR^2	<i>F</i>	<i>df1</i>	<i>df2</i>
					.121**	4.55	2	66
(Constant)	14.04	2.78		5.06				
IUS-12-P	.57	.19	.46	3.01**				
IUS-12-I	-.43	.21	-.31	-2.04*				
					.068*	5.42	1	65
(Constant)	11.19	2.95		3.79				
IUS-12-P	.52	.19	.42	2.80**				
IUS-12-I	-.69	.23	-.50	-2.96**				
PSWQ	.15	.06	.34	2.33*				
					.000	.02	1	64
(Constant)	11.51	3.67		3.14				
IUS-12-P	.52	.19	.42	2.78**				
IUS-12-I	-.69	.24	-.50	-2.92**				
PSWQ	.15	.07	.34	2.22*				
S-UPPS-P NU	-.04	.26	-.02	-.15				

Note: $R^2 = .189$; adjusted $R^2 = .138$. * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

IUS-12-P = Prospective Intolerance of Uncertainty; IUS-12-I = Inhibitory Intolerance of Uncertainty PSWQ = Penn State Worry Questionnaire; S-UPPS-P NU = UPPS-S Impulsive Behavior Scale-Short Form Negative Urgency.

Table 6. Stepwise hierarchical multiple regression, dependent variable = IUBEL
 “Impulsivity” scale. (N = 69).

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	ΔR^2	<i>F</i>	<i>df1</i>	<i>df2</i>
					.007	.23	2	66
(Constant)	3.54	1.19		2.99				
IUS-12-P	-.05	.08	-.10	-.64				
IUS-12-I	.05	.09	.10	.60				
					.000	.002	1	65
(Constant)	3.57	1.31		2.72				
IUS-12-P	-.05	.08	-.10	-.62				
IUS-12-I	.06	.10	.10	.55				
PSWQ	-.001	.03	-.007	-.04				
					.082*	5.78	1	64
(Constant)	1.36	1.56		.87				
IUS-12-P	-.08	.08	-.15	-.95				
IUS-12-I	.04	.10	.07	.41				
PSWQ	.01	.03	.08	.48				
S-UPPS-P NU	.26	.11	.30	2.40*				

Note: $R^2 = .089$; adjusted $R^2 = .032$. * = $p < .05$; ** = $p < .01$; *** = $p < .001$.

IUS-12-P = Prospective Intolerance of Uncertainty; IUS-12-I = Inhibitory Intolerance of Uncertainty PSWQ = Penn State Worry Questionnaire; S-UPPS-P NU = UPPS-S Impulsive Behavior Scale-Short Form Negative Urgency.