# Fearing Ambiguities:
# The Relationship Between Intolerance of Uncertainty and Anxiety Sensitivity

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## Introduction

- Intolerance of uncertainty is the misinterpretation of ambiguous information as threatening (Heyday et al., 2003)

- Uncertainty itself can be considered threatening (Epstein, 1972) and anxiety provoking (Hock & Krohne, 2004; Mogg et al., 1994)

- The Intolerance of Uncertainty Scale (IUS; Freeston et al., 1994) is designed to assess reactions to ambiguous situations, uncertainty, and future events; however, its psychometric properties remain unstable

- Freeston and colleagues (1994) found support for a five-factor model, while Buhr and Dugas (2002) found stronger support for a four-factor structure

- Norton (2005) suggested item-removal might improve the factor structure of the IUS without impacting scale reliability

- This study had two purposes:
  1. To perform confirmatory factor analyses (CFAs) comparing unitary, 4- and 5-factor structures
  2. To evaluate Norton's (2005) suggestion that a shortened IUS might be a more stable and efficient measure for evaluating intolerance of uncertainty

## Method

- Two independent data sets were required for evaluation

- Initial CFAs were performed on data collected from a study at the University of Regina (N = 254):
  - 61 men aged 19 to 37 (M = 23.2; SD = 4.2)
  - 193 women aged 18 to 50 (M = 22.9; SD = 5.7)

- The second data set was obtained in order to cross-validate results from the first analysis and was collected as part of a larger study at the University of Houston (N = 818):
  - 242 men aged 17 to 50 (M = 20.7; SD = 3.9)
  - 576 women aged 17 to 51(M = 20.6; SD = 4.1)

- The Regina questionnaire battery included the IUS

- The Houston questionnaire battery included the IUS and established measures of worry and anxiety:
  - The Beck Depression Inventory-II (BDI)
  - The Beck Anxiety Inventory (BAI)
  - The Generalized Anxiety Disorder Questionnaire-IV
  - The Penn State Worry Questionnaire

- CFAs were conducted to assess the degree to which unitary, 4-, and 5-factor structures of the IUS fit the Regina data set

## Results

- The unitary, 4- and 5-factor models previously proposed all failed to achieve good fit indices

- Norton's (2005) suggestion that item reduction might improve the stability of the IUS seemed reasonable

- Item Reduction Using the Regina Sample (N = 254)

  - The 4- and 5-factor models had a single factor accounting for a majority of the variance that did not have items in the primary factor of the other model

  - These items comprised a 17-item 2-factor model that correlated highly with the 27-item (r = .98) with a Cronbach's α = 0.94

  - Item face validity and a reliability analysis suggested the removal of 5 additional items

  - The 12-item measure was highly correlated with the 27-item original (r = .96), had excellent internal consistency α = .91, and seemed to represent two factors: anxiety related to the future (Prospective) and anxiety inhibiting action (Inhibitory)

- A subsequent CFA using the independent Houston sample (Table 1) supported using the 12-item measure

- Lastly, the 12-item and 27-item IUS demonstrated comparable convergent validity with the BDI (r = .56; .63), BAI (r = .57; .62), GADQ (r = .61; .64), and PSWQ (r = .54; .57), respectively

## Discussion

- The results of the CFA indicate that neither the 4-, or 5-factor models appropriately fit the data, with neither model being significantly better

- Results of this study provide support for use of the shortened IUS-12, as compared to the full 27-item IUS, as a psychometrically-sound tool for measuring intolerance of uncertainty

- Convergent validity with measures of worry, anxiety, and depression remained good even after item removal was complete, indicating the selected items tap key elements in the latent construct

- Intolerance of uncertainty, being fundamental to worry (Laugesen et al., 2003), state anxiety (Greco & Roger, 2001), and related anxiety pathologies (Tolin et al., 2003), may play an as-of-yet unexplored but substantial role in several anxiety disorders

- Theoretically, intolerance of uncertainty may also be related to anxiety sensitivity (Peterson & Reiss, 1992), as fear of uncertainty and fear of physical sensations with uncertain meanings seem closely related

- This shortened version of the IUS should encourage increased evaluation of the intolerance of uncertainty in a variety of populations and assessment of its relationship with fear and anxiety-based constructs

### Table 1. Confirmatory Factor Analyses Fit Indices for of the IUS versions

| | | $\chi^2$/df | CFI | SRMR | RMSEA | RMSEA CI | ECVI | ECVI CI |
|---|---|---|---|---|---|---|---|---|
| Regina Sample | 27-item, 1-Factor | 2.97 | 0.84 | 0.06 | 0.10 | 0.09; 0.11 | 4.84 | 4.45; 5.26 |
| | 27-item, 4-Factor | 2.59 | 0.88 | 0.06 | 0.08 | 0.08; 0.09 | 3.96 | 3.62; 4.32 |
| | 27-item, 5-Factor | 2.43 | 0.89 | 0.07 | 0.08 | 0.07; 0.09 | 3.67 | 3.36; 4.02 |
| | 17-item, 2-Factor | 2.22 | 0.94 | 0.05 | 0.07 | 0.06; 0.08 | 1.31 | 1.14; 1.51 |
| | 12-item, 2-Factor | 1.90 | 0.97 | 0.04 | 0.06 | 0.04; 0.08 | 0.58 | 0.49; 0.71 |
| | 12-item, 1-Factor | 3.84 | 0.90 | 0.06 | 0.12 | 0.11; 0.14 | 1.22 | 1.03; 1.43 |
| Houston Sample | 12-item, 2-Factor | 4.34 | 0.96 | 0.04 | 0.07 | 0.06; 0.07 | 0.35 | 0.30; 0.42 |
| | 12-item, 1-Factor | 7.47 | 0.92 | 0.05 | 0.10 | 0.09; 0.11 | 0.64 | 0.56; 0.73 |

Chi-square/degrees of freedom ration ($\chi^2$/df should be < 2.0), Comparative Fit Index (CFI; Should be close to .95), Root Mean Square Error of Approximation (RMSEA; should be < .06), Standardized Root Mean Square Residual (SRMR; should be < .08), Expected Cross-Validation Index (ECVI; lower values indicate better fit). Higher CFI values indicate better fit, whereas lower values on all other indices indicate better fit.
RMSEA CI = 90% Confidence Interval for RMSEA (low; high).
ECVI CI = 90% Confidence Interval for ECVI (low; high).

### Table 2. Descriptive statistics for the IUS-12 (n = 818; Houston Sample)

| Item | IUS | Factor | Loading | M | SD | Skew | Kurtosis |
|---|---|---|---|---|---|---|---|
| 1. Unforeseen events upset me greatly. | 7 | 1 | 0.75 | 1.94 | 1.11 | 1.08 | 0.31 |
| 2. It frustrates me not having all the information I need. | 8 | 1 | 0.69 | 2.89 | 1.18 | 0.12 | -0.85 |
| 3. One should always look ahead so as to avoid surprises. | 10 | 1 | 0.64 | 2.44 | 1.2 | 0.49 | -0.71 |
| 4. A small unforeseen event can spoil everything, even with the best of planning. | 11 | 1 | 0.67 | 2.21 | 1.22 | 0.77 | -0.42 |
| 5. I always want to know what the future has in store for me. | 18 | 1 | 0.66 | 2.75 | 1.26 | 0.3 | -0.88 |
| 6. I can't stand being taken by surprise. | 19 | 1 | 0.71 | 1.85 | 1.03 | 1.17 | 0.78 |
| 7. I should be able to organize everything in advance. | 21 | 1 | 0.59 | 2.6 | 1.22 | 0.35 | -0.84 |
| 8. Uncertainty keeps me from living a full life. | 9 | 2 | 0.75 | 1.84 | 1.1 | 1.24 | 0.68 |
| 9. When it's time to act, uncertainty paralyses me. | 12 | 2 | 0.75 | 1.75 | 1.04 | 1.35 | 1.04 |
| 10. When I am uncertain I can't function very well. | 15 | 2 | 0.79 | 1.94 | 1.01 | 0.92 | 0.22 |
| 11. The smallest doubt can stop me from acting. | 20 | 2 | 0.65 | 1.95 | 1.05 | 1.24 | 0.31 |
| 12. I must get away from all uncertain situations. | 25 | 2 | 0.74 | 1.7 | 1.03 | 1.51 | 1.58 |
| Total IUS-12 | | | | 25.85 | 9.45 | 0.84 | 0.31 |

Factor 1 - Prospective Anxiety
Factor 2 - Inhibitory Anxiety