

So you want to go to graduate school in psychology? (really?)

Some things to think about before applying...

some tips on how to get in & survive life in graduate school & beyond...

& a personal account of the types of experiences you get to enjoy while being a graduate student (especially the research - really!)

Kathryn A. Sexton
November 16, 2011

Planning your trajectory through undergrad & graduate school...

Caveat:

There is no set pathway through to graduate studies & your career afterward...

But one can learn to appreciate this uncertainty

The Ph.D. Game					
1. Your supervisor gives you project title. Go on 3 spaces.	2.	3. You are full of enthusiasm. Have another turn.	4. Realise supervisor has given nothing but project title. Miss one turn.	5. Go to library - you can't understand catalogue. Miss one turn.	6. The important reference is in reference. Back two spaces.
14. You become disinterested, miss 1 turn.	13. Unlucky for some. You become disinterested, miss 1 turn.	15. END OF FIRST YEAR	11. Edna and I are impressed by first year report. throw 1 to continue.	10. Do extra work on first year report. extra turn.	9. Use beer to buy technical assistance! Go on two spaces.
15. You become depressed. Miss two turns.	16. You become more depressed. Miss three turns.	17. Change project. Go back to beginning.	18. Change supervisor. Go on 6 spaces.	19. Do lab training and go to get some cash. Go on 2 spaces.	20.
28. You begin to think you will never finish. (edna!) probably right.	27. Beer in sister strikes! Speed turn recovering.	26. Work every weekend for two months. Go on six spaces.	25. END OF SECOND YEAR	24. Edgerment are working. Go on 4 spaces.	23. Specimens incorrectly labelled. Go back to 20.
29.	30. You spend more time completing than working. Miss 1 turn.	31. You realise your mates are earning \$1 fees! your grant. Miss a turn have a good cry.	32. You are asked why you started a Ph.D. Miss a turn find a reason.	33. You are offered a job, you may want or refuse from game.	34. Start writing up. Now you are really depressed. Miss 5 turns.
45. Your Ph.D. awarded congratulations now you do a job.	44. You are asked to resubmit it thesis. Back to 33.	40. You decide this isn't worth the bother. Withdraw now. Game over.	39. 3 years are up, and you get a job. Go on 3 spaces.	38. It proves impossible to write up and work. Go to 33.	37. Your thesis will improve. external examiners work. Go back to 26.
					36. Your data have just been published by rival group. Go back to 23.

Getting into graduate school

• What's important?

– Grades very important

- faculty see this as an indicator of how likely you will be able to successfully apply for funding...
- & it is, because federal funding agencies have minimum cut-offs
- so does your department when selecting which applications to give an **A** before forwarding them to federal funding agencies

– GRE sometimes important

- often used as a minimum cut-off (especially in the US, but at some schools in Canada too)
- beyond that I'm not sure its considered much
- so... top marks not critical... just beat the minimum cut-offs
- but they are challenging, so do take the time to study well
- But **DO NOT** get derailed by this: just get 'er done!

Getting into graduate school

• What's important?

– Letters of reference

- ask if they can give you a good letter of reference... if not, not good
 - This has probably been oversaid, but as all letters are generally good, they don't distinguish much between applicants.
 - What's most important is that they're not bad.
 - But if you can get a glowing reference, great.
- so, from whom?
 - thesis advisor, profs for whom you did excellent coursework, also...

– Other experiences

- TAships... good experience, & the prof can provide a more informed reference letter
- show a good work ethic generally... even at your day job
 - & if you can get a referee to give you glowing reviews, that's great
- if you're interested in Clinical Psych: clinical experience can be good, but is not essential
 - e.g., volunteering, peer support, something to gain some practical experience

Getting into graduate school

• What's important?

– Research Experience

- perhaps one of the most important "extras"
- let's be honest: even if you do Clinical Psych, a huge portion of graduate school involves research
 - if you don't show interest and aptitude, this will concern the prof you're applying with
- and if you really aren't interested... if you **HATE** research...
 - then maybe reconsider whether grad school is for you

• What to do & How to get experience...

- Learn methodology, learn stats, get practical experience with SPSS
 - (Seriously, folks, **4100** puts you way ahead of the game here)
 - But research assistant work, if you can find it, does wonders too
 - Try for summer scholarships, work for your thesis advisor, take Advanced Readings & Research course
- Get it anywhere you can...
 - Excellent if you can get your name on something published
 - e.g., conference abstract, article
 - Prairie Research Conference good place to start

Getting into graduate school

- **What's important?**
 - Strategic use of your time in undergrad...
 - You can't do everything (you're not supposed to say this, but it's true... Duh, right?).
 - Choose where you want to highlight your talents.
 - Don't stretch yourself so thin that you slide in your performance everywhere.
 - And you don't have to be perfect. Keep your sense of work-life balance, as much as possible.
 - But you **DO** have to work hard, and you **DO** have to show your quality.

Strategies for *applying* to graduate school

- **What's important?**
 - **Letter of Intent**
 - Tailor it to the site... do your research on the university, the lab, the prof's research... and don't get lazy & send the same generic letter everywhere
 - **Effectively selecting where to apply, & WHOM to apply with**
 - It's about individual goodness-of-fit, but...
 - Not all profs take students each year
 - & Not all profs have funding to take a student on...
 - best to join a lab that's been reasonably successful... or a vibrant department with good productivity & funds
 - But the big name profs are not always easily available to their grad students...
 - sometimes up & coming profs better as supervisors
 - Look for a happy team (content students, an RA)
 - makes for a productive lab, & good research support

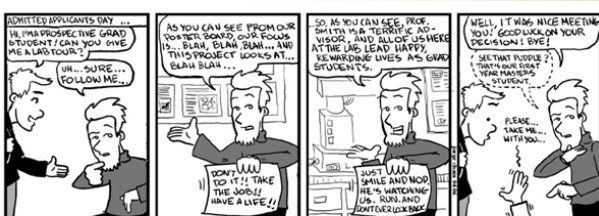
Applying to graduate school

- **What NOT to do...**
 - Skip checking with the prof before applying to see if he/she is taking students
 - lots of reasons could be unavailable... sabbatical, maternity leaves, not funded, or not afforded space to take on clinical students that year
 - Be too focused or rigid about your stated area of research interest...
 - if you come in with too specific an agenda, that may not fit well with your supervisor's research program
 - Try to save the world in graduate school... & worse, say so
 - Sell yourself as a "good listener" to get into Clinical Psych...
 - if you must, talk about specific examples of your skills, interest - from your PRACTICAL experience only
 - Skip the in-person interview if you're truly interested in a site...
 - 6-8 years a long time to spend in a lab with prof & other students you haven't met yet
 - Forget to send that thank-you email for being considered, even if you've been rejected

Applying to graduate school

- **What TO DO...**
 - Apply to a good selection of graduate schools
 - Be open to exploring some different areas of research
 - Research the labs, profs you're interested in
 - Email the prof before applying
 - ask if he/she is taking students, express interest
 - If you've received some indication of interest... ask if you can go visit the lab
 - shows interest, intent
 - Consider going out of province
 - Talk to other students in the lab before accepting an offer
 - make sure you're headed somewhere with a positive atmosphere

Seriously, talk to the students... they **KNOW!**



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Applying to graduate school

- **What TO DO...**
 - If you don't make it in the first year & this is what you want to do... re-apply
 - There are so many pragmatic obstacles that can hinder acceptance - rejection isn't necessarily reflective of your aptitude
 - But, take the opportunity to beef up that resume

Options other than graduate school

- But if graduate school doesn't work out, or really isn't for you...
 - There are plenty of other things to do with your undergraduate psychology degree!
 - (I'm not the most informed person to talk to about this, though)
 - Many jobs benefit from application of your psych knowledge & skills (& your 4100 stats!)
 - Plus a few perks:
 - Less student debt
 - Don't have to stay in school for another 6-8 years
 - MA is 2 years (some folks take 3)... PhD minimum 3 (+ 1 year residency for clinical programs) - but many students take longer
 - Average length of PhD in Clinical Psych is hovering around 8.3 yrs
 - Maybe a little more free time to play with?

Life in graduate school... the fun parts

- Some of the perks...
 - Intellectual freedom (at least some day, I'm told...)
 - Greater flexibility than in undergrad to study what you want, & set when you want to put in those work hours
 - After the first 2-3 of years, few courses in graduate school
 - Get paid (a little) to learn
 - Often excellent seminars, guest lecturers visiting program
 - (mostly excellent... or at worst, good for nap)
 - But seriously, if you hate lectures & hearing about new findings, grad school may NOT be for you!

Seminar BINGO!

To play, simply print out this bingo sheet and attend a departmental seminar.

Mark over each square that occurs throughout the course of the lecture.

The first one to form a straight line (or all four corners) must yell out to win!

BINGO!!



SEMINAR BINGO				
Speaker bashes previous work	Repeated use of "um..."	Speaker sucks up to host professor	Host Professor falls asleep	Speaker wastes 5 minutes explaining outline
Laptop malfunction	Work ties in to Cancer/HIV or War on Terror	"...et al."	You're the only one in your lab that bothered to show up	Blatant typo
Entire slide filled with equations	"The data clearly shows..."	FREE Speaker runs out of time	Use of Powerpoint template with blue background	References Advisor (past or present)
There's a Grad Student wearing same clothes as yesterday	Bitter Post-doc asks question	"That's an interesting question"	"Beyond the scope of this work"	Master's student bobs head fighting sleep
Speaker forgets to thank collaborators	Cell phone goes off	You've no idea what's going on	"Future work will..."	Results conveniently show improvement

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Life in graduate school... the fun parts

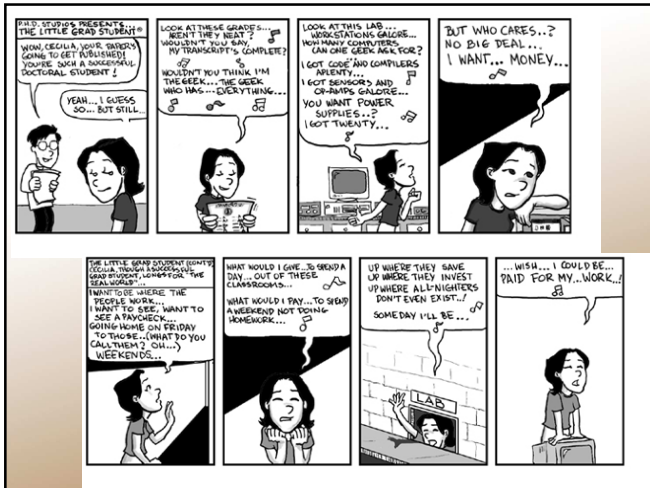
- Some more of the perks...
 - Do research that interests you
 - Work with great like-minded colleagues; & you make excellent friends
 - Get excellent mentorship
 - for research skills, clinical skills if that's what you opt for, career development
 - Travel to conferences
 - Can be an opportunity to move to a new city...
 - & walk-in to a built-in supportive network

Doubts about graduate school?



Life in graduate school... the not so fun parts

- The disadvantages...
 - Frequent applications...
 - E.g., for funding
 - If you're in a Clinical Program, for practica & residency
 - Partly reflects that you're in a period of life with a lot of transitions
 - No two years the same... appealing or not?
 - Limited funds (not no funds... this isn't quite like undergrad, although...)



Life in graduate school... the not so fun parts

- The disadvantages...
 - Deadlines, deadlines, deadlines
 - You work hard (what's that saying about the reward for good work being more work?)
 - Sometimes very demanding hours

Been there, done that...

OH, I THOUGHT HE'S STILL YOUNG I HAVE TO FINISH THIS PAPER TONIGHT.
 CAN'T... FALL... ASLEEP... MUST... STAY...
 BLINK...
 DARN...

Life in graduate school... the not so fun parts

- The disadvantages...
 - Might find you have more restrictions on your leisure time...
 - but then again, you have more flexibility in when you set your work hours & when you take vacation time than do most jobs... usually...

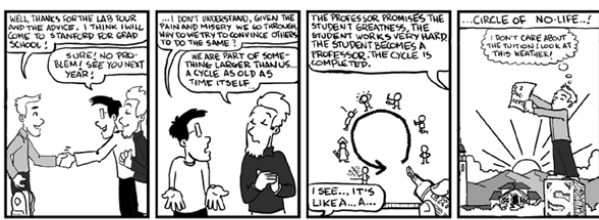
Been there, done that too...

HI, PEECE SMITH...
 COULDN'T HAVE A SEAT... SO WHAT DID YOU DO OVER SPRING BREAK?
 I HAD AN AMAZING BREAK! WENT SKIING, MOUNTAIN BIKING... I LAUGHED AT MY SOME LEISURE READING, I HUNG OUT AND DID NOTHING... I'M TOTALLY RELAXED! IT WAS GREAT...
 YOU MEAN WHAT RESEARCH DID I DO OVER SPRING BREAK, DON'T YOU?
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Life in graduate school... the not so fun parts

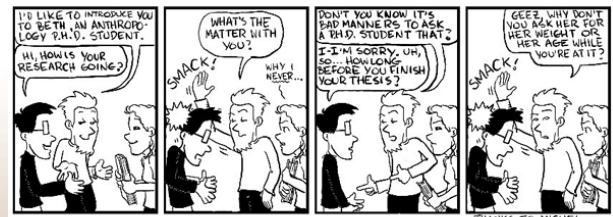
- The disadvantages...
 - Not a guaranteed job waiting for you at the end... still have to work to carve out the career you want
 - It's true: for some things "a PhD is not enough!"
 - So... you have to love the work, & enjoy being a student, for it to be worth it. But if you do enjoy those things, it definitely is!

A little background music, anyone? (Circle of academia?... really?)



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Now, a little bit about my own PhD research



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Distinct Negative Beliefs about Uncertainty and their Association with Worry:

An Exploration of the Factors of the Intolerance of Uncertainty Scale and their Correlates

A 2-study doctoral dissertation... presented here briefly & with a few additional findings still trailing me from my undergrad

Kathryn A. Sexton



First, some background information...

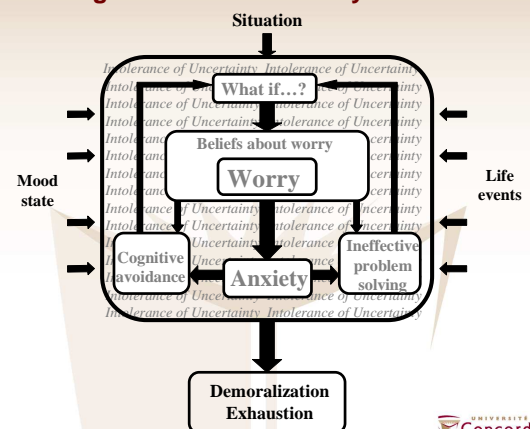
Why work at defining distinct negative beliefs about uncertainty?

The state of affairs when this was an uncertain PhD thesis in the making...

Studying Worry

- Defined as "a cognitive phenomenon... concerned with future events where there is uncertainty about the outcome, the future being thought about is a negative one, and this is accompanied by feelings of anxiety"
 - (MacLeod, Williams, & Bekerian, 1991, p. 478).
- Cardinal feature of Generalized Anxiety Disorder (GAD)
- We all worry somewhat, but individuals with GAD...
 - worry more often, and for longer periods (Dupuy, Beaudoin, Rhéaume, Ladouceur, & Dugas, 2001)
 - perceive their worry as harmful and dangerous (Ruscio & Borkovec, 2004)
 - perceive their worry as uncontrollable, less realistic, and less likely to be mitigated by attempts to cope (Craske, Rapee, Jackel, & Barlow, 1989)

A Cognitive Model of Worry in GAD...



(Dugas et al., 1998)



A Cognitive Model of Worry in GAD...

- **Intolerance of Uncertainty (IU)**
 - a dispositional characteristic that results from a set of negative beliefs about uncertainty and its implications (Dugas & Robichaud, 2007)
- Three subsidiary model components:
 - **Positive beliefs about the usefulness of worry**
 - It's motivating, means I'm conscientious, prevents me from feeling guilty, facilitates problems-solving...
 - **Negative problem orientation**
 - NOT problem-solving skills, but a person's attitudinal set when facing problems
 - **Cognitive avoidance**
 - Strategies to mentally avoid perceived threat
 - Thought suppression, thought substitution, distraction, avoiding stimuli that trigger worries, avoiding mental images

Specificity of IU to Excessive Worry

- IU a stronger predictor of worry than 3 other model components
 - continues to predict a unique proportion of the variance in worry (Dugas, Gagnon, Ladouceur, & Freeston, 1998)
- IU predicts severity of worry & somatic symptoms of anxiety within clinical GAD populations (Dugas et al., 2007)
- IU more specifically related to worry than to many of the other anxiety disorders
 - as a group (Ladouceur et al., 1999)
 - GAD > anxiety disorders > non-anxious controls
 - compared to panic disorder (Dugas, Marchand, & Ladouceur, 2005)
 - when controlling for global vulnerabilities to anxiety/depression, such as neuroticism/negative affect:
 - IU still related to worry (Norton & Mehta, 2007; Norton, Sexton, Walker, & Norton, 2005; van der Heiden et al., 2010, Sexton, Norton, Walker, & Norton, 2003)
 - but NOT to symptoms of panic, health anxiety (Norton et al., 2005; Sexton et al., 2003), sometimes OCD (but mixed results; Norton & Mehta, 2007)

Hierarchical vulnerabilities to worry, anxiety, and depression in a clinical sample:

The contribution of intolerance of uncertainty

Kathryn A. Sexton^{1,2}, Peter J. Norton³, John R. Walker², & G. Ron Norton⁴

¹Department of Psychology, Concordia University, Montréal, Canada

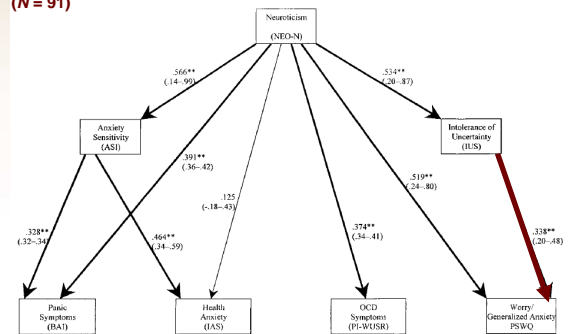
²Department of Clinical Health Psychology, University of Manitoba, Winnipeg, Canada

³Department of Psychology, University of Houston, Houston, USA

⁴Department of Psychology, University of Winnipeg, Winnipeg, Canada

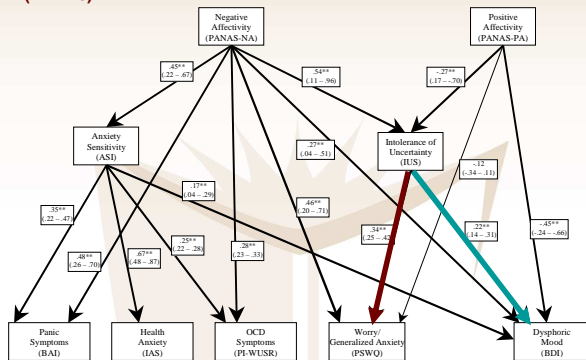
Hierarchical Model of Vulnerabilities to Anxiety Disorders (Sexton, Norton, Walker & Norton, 2003)

(N = 91)



Expanded Hierarchical Model of Vulnerabilities (Norton, Sexton, Walker, & Norton, 2005)

(N = 125)



The Role of IU in Excessive Worry: Causal?

- IU proposed as a **cognitive vulnerability** factor for worry
- Criteria for establishing vulnerability (Garber & Hollon, 1991; Kraemer et al., 1997; Riskind & Allow, 2006):
 - **Manipulability** (Ladouceur, Gosselin, & Dugas, 2000)
 - E.g., Experimental manipulation of the acceptability of uncertainty, in a gambling task
 - ↑ IU leads to ↑ worry, ↓ IU leads to ↓ worry
 - **Temporal antecedence** (Dugas & Ladouceur, 2000; Donegan & Dugas, 2011)
 - Changes in IU precede changes in worry during treatment
 - **Stability** (i.e., a trait characteristic)
 - (r = .74-.78 over 5-weeks; Buhr & Dugas, 2002; Dugas, Freeston, & Ladouceur, 1997)
 - **Construct validity**
 - Shows convergent validity (Buhr & Dugas, 2006), behavioural manifestations
 - E.g., information-seeking (Rosen & Knäuper, 2009), decision-making delays (Ladouceur, Talbot, & Dugas, 1997)
 - Associated with other more proximal worry-related processes that “transmit” (mediate) the vulnerability
 - E.g., **information-processing** (appraisal) biases (Bredemeier & Berenbaum, 2008; Dugas et al., 2005; Koerner & Dugas, 2008)

Particularly at moderate levels of ambiguity

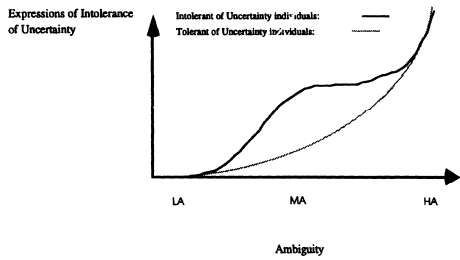


Figure 1. Relationship between the perception of ambiguity and behavioral expressions of intolerance of uncertainty.

The Role of IU in Excessive Worry

- IU pathways to worry
 - Direct influence on worry
 - Indirect pathways or interactions with other model components
 - Positive beliefs about worry
 - Negative problem orientation
 - Cognitive avoidance
 - Indirect pathway via information-processing biases
 - Biased attention for ambiguous stimuli
 - Biased appraisals/interpretations of ambiguous situations as threatening
 - Biased memory / recall?

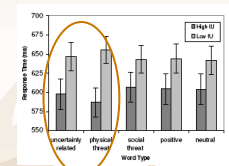
The Role of IU in Excessive Worry

- Indirect influence of IU on worry
 - Mediating role of other model components not strictly established, but suggested...
 - Positive beliefs about worry may lead to use of worry as a strategy for coping with uncertainty
 - IU & negative problem orientation (NPO) make independent contributions to worry (Dugas et al., 1997), but IU may also lead to NPO by enhancing the perceived threat of a problem
 - IU promotes cognitive avoidance of uncertain situations that are perceived as threatening; high levels of IU then interfere with the effectiveness of this avoidant strategy (Koerner & Dugas, 2006)
- Only partially... IU remains a significant predictor of worry (Dugas et al., 1998)

The Role of IU in Excessive Worry

- IU proposed to contribute to worry by affecting biases in information processing
 - Biased attention (Heinecke, Koerner, & Dugas, 2006)
 - Biased appraisals or interpretations (Dugas, Hedayati, et al., 2005; Koerner & Dugas, 2006, 2008)
 - Biased memory / recall? (Dugas, Hedayati, et al., 2005)

E.g., Attentional Biases



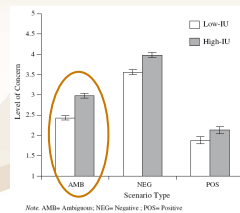
Dot probe task (more ecologically valid because stimuli are competing)

* Individuals high on IU respond more quickly to physically threatening & to ambiguous words

The Role of IU in Excessive Worry

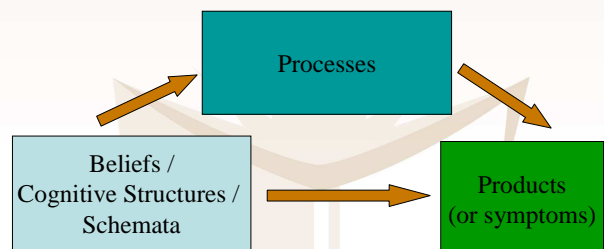
- IU proposed to contribute to worry by affecting biases in information processing
 - Biased attention (Heinecke, Koerner, & Dugas, 2006)
 - Biased appraisals or interpretations (Dugas, Hedayati, et al., 2005; Koerner & Dugas, 2006, 2008)
 - Biased memory / recall? (Dugas, Hedayati, et al., 2005)
- Do information-processing biases play a mediating role?

E.g., Interpretive Biases



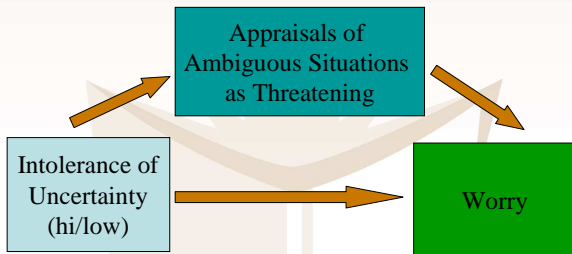
* remained significant when controlling for gender, depression, anxiety, GAD somatic symptoms, & worry

Consistent with basic cognitive theory as proposed by Beck (1979)



Is the IU-worry association mediated by information processing biases?

(Koerner & Dugas, 2008)



(controlling for gender, GAD somatic symptoms, anxiety, & depression)

The Role of IU in Excessive Worry

- Review of IU pathways to worry:
 - Direct influence
 - Interaction with other cognitive vulnerabilities in model
 - Leads to information processing biases
- Coming back to the construct of IU, a question that arises:
 - Intolerance of uncertainty is proposed to result from a *"set of negative beliefs about uncertainty"* (Dugas & Robichaud, 2007, p. 24)
 - But these beliefs have not yet been defined
 - So what are the *specific beliefs about uncertainty* that may be most predictive of worry & associated information-processing biases?
 - In other words, **what** is it about uncertainty that is intolerable?

Measurement of IU

The Intolerance of Uncertainty Scale (IUS)

- Self-report measure developed by Freeston, Rhéaume, Letarte, Dugas, & Ladouceur (1994)
 - Based on self-reports from GAD clients
 - 27 items
 - E.g., "Unforeseen events upset me greatly,"
 - "Being uncertainty means that I am not first rate,"
 - "It's unfair having no guarantees in life"
 - Validated in French & in English (translation)
 - Sound psychometric properties
 - High internal consistency of measure, stability over time
 - Demonstrated convergent, criterion, and discriminant validity in clinical & non-clinical populations

The Intolerance of Uncertainty Scale

- IUS currently employed as a unifactorial measure, no subscales yet
- Factor analysis of the IUS could derive these specific beliefs/subscales
- BUT... the IUS factor structure is highly variable across studies & is as yet unrepliated

The Ph.D. Game						
1. Your supervisor gives you project title. Go on 3 spaces.	2. →	3. You are full of enthusiasm. Have another turn.	4. Realise supervisor has still nothing but project title.	5. Go to library - you can't understand catalogue. Miss one turn.	6. The important reference is in Japanese. Back two spaces.	7. →
14. →	13. Unlucky for some. You become disliking, miss 1 turn.	12. END OF FIRST YEAR	11. Exam next! not impressed. By first year report, throw 1 to cont.	10. Do extra work on first year report, extra turn.	9. Use beer to buy food-stud assistance. Go on five spaces.	8. Need supervisors help. Miss one turn (finding him).
15. You become desperate! Miss two turns.	16. You become more desperate! Miss three turns.	17. Change project. Go back to beginning.	18. Change supervisor. Go on 6 spaces.	19. Do lab demonstration to get home early. Go on 2 spaces.	20. →	21. Lab demos take up too much of your time. Back 4 spaces.
28. You begin to think you will never finish. You are probably right.	27. Beer monster strikes! Spend 1 turn recovering.	26. Work every weekend for two months. Go on six spaces.	25. END OF SECOND YEAR. No extra. Who cares, throw again.	24. Experiment - are drinking. Go on 4 spaces.	23. Specimens incorrectly labelled. →	22. →
29. →	30. You spend more time complaining than working. Miss 1 turn.	31. You realise your money and earning 9 times your grant, have a good cry.	32. You are actually you, started a Ph.D. Miss a turn. Fading or sane.	33. You are offered a job, you may cont or retire from game.	34. Start writing up. How you are really depressed. Miss 5 turns.	35. →
42. Your Ph.D. is awarded congratulations from your class.	41. You are asked to resubmit the thesis. Back to 33.	40. You decide Ph.D. isn't worth the bother. Withdraw now. Game over.	39. 3 years are up, and you get a job. Go on 3 spaces.	38. It proves impossible to write up and work. Go to 33.	37. Your thesis will approve external examiners work. Go back to 28.	36. Your data have just been published by rival group. Go back to 28.

The Intolerance of Uncertainty Scale: So What is the Factor Structure?

Kathryn A. Sexton¹ & Michel J. Dugas^{1,2}

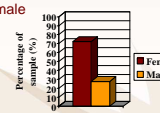

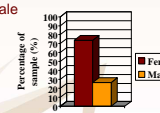
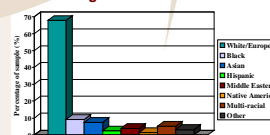
¹Concordia University, Montreal, Canada

²Hôpital du Sacré-Coeur, Montreal, Canada

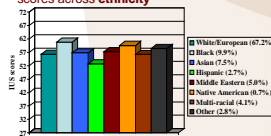
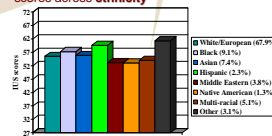
Deriving a consistent IUS factor structure

- Aggregated data from 16 studies conducted in the Anxiety Disorders Laboratory at Concordia University in Montreal, Canada, from 1998-2006
 - All having completed the English translation of the IUS
 - So a much **larger** sample than previous studies ($N = 2451$)
- 2-stage** procedure: Participants randomly assigned to one of two datasets
 - Exploratory factor analysis** with first dataset
 - Employing more rigorous statistical procedures to accurately assess the **number** of factors
 - Confirmatory factor analysis** with second half of sample
 - Is it a **replicable** factor structure?
- No significant differences between the datasets in:
 - Mean IUS scores
 - Reliability of IUS scores
 - total scale $\alpha = .95$ in both samples
 - Demographic variables: age, sex, ethnicity

Separate Exploratory & Confirmatory Samples

- $N = 1230$
 - Aged 17 to 80 years
 - $M = 23.83, SD = 6.44$
 - 72.4% female
 
 - For the 954 individuals who reported ethnic origin...
 
- $N = 1221$
 - Aged 17 to 68 years
 - $M = 23.65, SD = 6.28$
 - 73.6% female
 
 - For the 910 individuals who reported ethnic origin...
 

IU by the demographics

- Exploratory Sample** ($n = 1230$)
 - significant but small **sex** difference in IUS
 - $F_{(1,1227)} = 7.674, p < .01, d = .18$
 - no significant differences in mean IUS scores across **ethnicity**

- Confirmatory sample** ($n = 1221$)
 - significant but small **sex** difference in IUS
 - $F_{(1,1216)} = 4.573, p < .05, d = .14$
 - no significant differences in mean IUS scores across **ethnicity**


Exploratory factor analysis results: There are 2 factors (beliefs) to the IUS

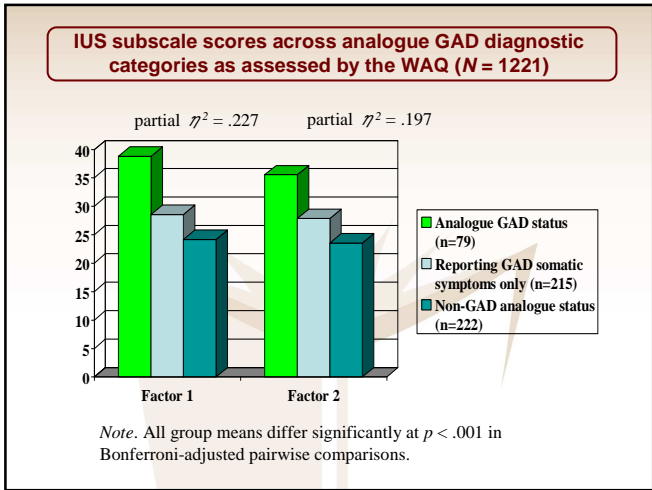
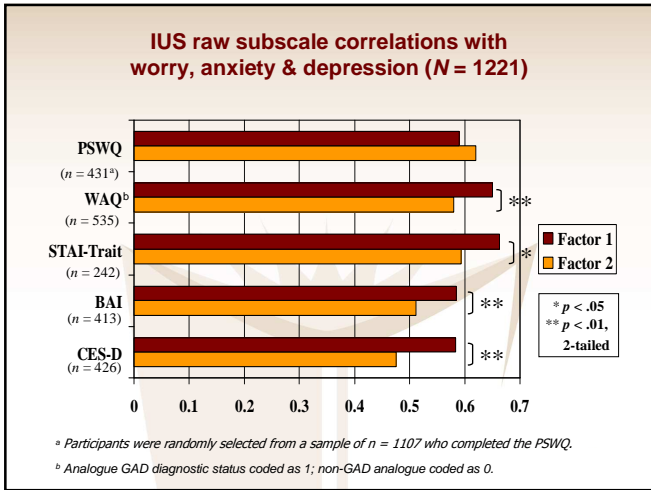
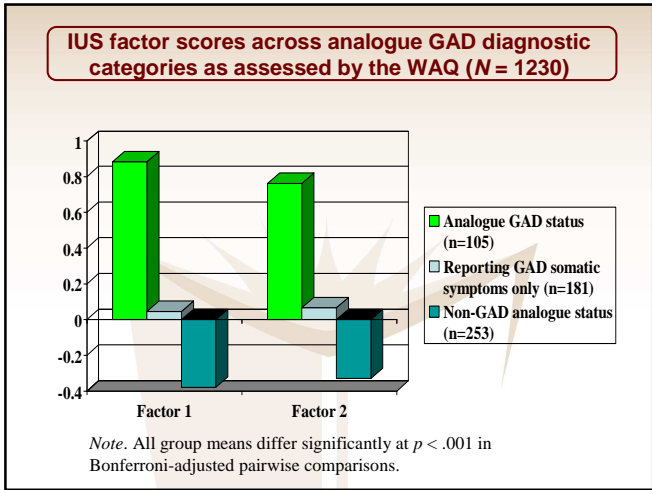
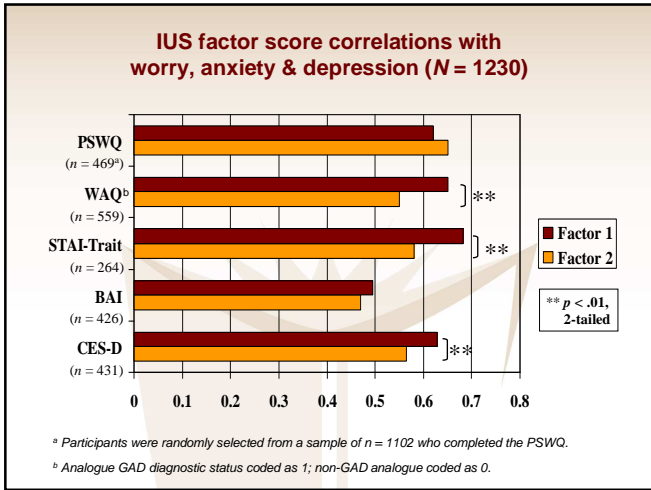
- Factor 1: the belief that *Uncertainty has negative behavioural & self-referent implications***
 - (IUS-NI)
 - 15 items, $\alpha = .92$
- Factor 2: the belief that *Uncertainty is unfair and spoils everything***
 - (IUS-US)
 - 12 items, $\alpha = .92$
- Factors significantly correlated ($r = .76$)
 - reflecting overall predisposition to experience uncertainty as aversive

The Two Factors of the IUS

- Factor 1: Uncertainty has negative implications**
 - e.g., behavioural consequences:
 - "When it's time to act, uncertainty paralyses me."
 - "When I am uncertain, I can't go forward."
 - "When I am uncertain, I can't function very well."
 - e.g., self-referent implications
 - "Being uncertain means that I am not first rate."
 - "Being uncertain means that I lack confidence."
 - "Uncertainty makes me vulnerable, unhappy, or sad."
- Factor 2: Uncertainty is unfair and spoils everything**
 - "It's unfair having no guarantees in life."
 - "It frustrates me not having all the information I need."
 - "I can't stand being taken by surprise."
 - "My mind can't be relaxed if I don't know what will happen tomorrow."
 - "One should always look ahead so as to avoid surprises."

Criterion-related validity of the IUS factors: Associations with symptom measures in the 2 samples

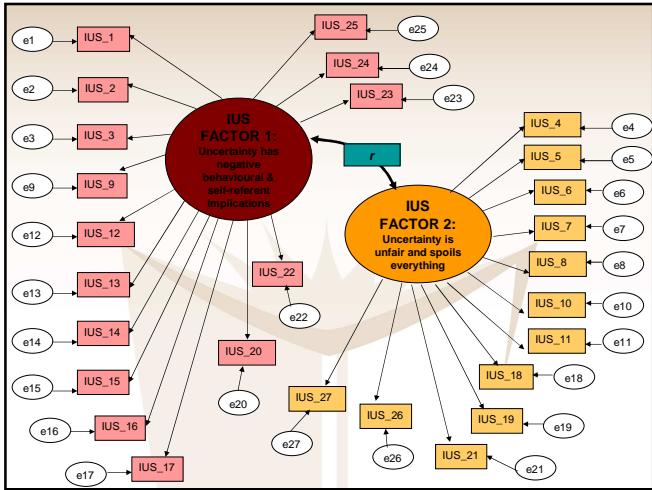
- Penn State Worry Questionnaire (PSWQ)**; Meyer, Miller, Metzger, & Borkovec, 1990
 - assesses excessive, generalized worry
- Worry and Anxiety Questionnaire (WAQ)**; Dugas et al., 2001
 - screens for GAD: assesses cognitive (i.e., worry) and somatic symptoms of GAD, & their interference
- State Trait Anxiety Inventory (Form Y) – Trait version (STAI-T)**; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1977
 - assesses trait anxiety/neuroticism
- Beck Anxiety Inventory (BAI)**; Beck, Epstein, Brown, & Steer, 1988
 - assesses mainly somatic symptoms of anxiety
- Centre for Epidemiologic Studies - Depression scale (CES-D)**; Radloff, 1977
 - assesses depression symptoms



But is the factor structure stable / replicable?

Confirmatory factor analysis...

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IUS 2-factor model goodness of fit

- Comparative Fit Index (CFI) = .97 ✓
– > .95 recommended (Hu & Bentler, 1999)
- Bentler-Bonett Normed GFI = .96 ✓
– > .90 recommended (Tabachnick & Fidell, 2001)
- Standardized root mean-square residual (SRMR) = .05 ✓
– < .08 recommended (Hu & Bentler, 1999)
- Root mean-square error of approximation (RMSEA) = .07 X
– < .06 recommended (Hu & Bentler, 1999)
- ... overall, 2-factor model of the IUS showed good fit
- 2-factor solution provided a superior fit to the data than the 1-factor model
– $\Delta \chi^2 = 2910.687$ for $\Delta df = 1, p < .001$

Summary of Study 1 Findings

- Support for the construct validity of intolerance of uncertainty
 - Identified a “set of beliefs” about uncertainty in an exploratory factor analysis of the IUS items ($n = 1230$)
 - These subscales were replicated in a separate sample using confirmatory factor analysis ($n = 1221$)
- Preliminary evidence of criterion-related & discriminant validity of IUS subscales
 - Distinct patterns of association with symptoms and analogue diagnostic status
 - Belief that **uncertainty has negative implications (Factor 1)** more highly correlated with:
 - analogue GAD diagnostic status (WAQ)
 - trait anxiety (STAI-T)
 - somatic anxiety (BAI)
 - depressive symptoms (CES-D)
 - Belief that **uncertainty is unfair and spoils everything (Factor 2)**...
 - similarly correlated with worry (PSWQ)
- But, will the subscales show distinct pattern of behavioural and cognitive correlates consistent with the factor labels?

Uncertainty has Negative Implications and is Unfair: Construct Validity of the Intolerance of Uncertainty Scale and its Subscales

Kathryn A. Sexton¹, Michel J. Dugas^{1,2}, & Naomi Koerner³

¹Concordia University, Montreal, Canada
²Hôpital du Sacré-Coeur, Montreal, Canada
³Ryerson University, Toronto, Canada

Study 2 Goals: Examining the construct validity of IU beliefs

- The purpose of this study was threefold:
 - 1) To again replicate the IUS factor structure proposed in Study 1
 - 2) To further examine the **construct validity** of the IUS subscales
 - by assessing their **convergent** and **discriminant validity** with other conceptually overlapping **cognitive** and **behavioural** processes
 - 3) To further assess the **concurrent criterion-related validity & specificity** of these two negative beliefs about uncertainty
 - to examine associations with **information processing** (as symptoms previously assessed in Study 1)
 - do they predict **negatively biased appraisals** in ambiguous situations?
 - do these beliefs relate to and make **unique contributions** to self-reported behavioural, cognitive, and emotional reactions in ambiguous situations?
 - a new self-report measure, the **Ambiguous Situations Questionnaire (ASQ)**, was developed for this purpose

To address study goal #2: Convergent & discriminant validity of the IUS

- We expected that the **belief that uncertainty has negative behavioural & self-referent implications (IUS-NI)** would show **convergent validity** and correlate with measures of:
 - **Indecisiveness** (FIS)
 - **Procrastination** (LGP)
 - the tendency to **personalize** negative situations (CEQ-P)

... and these correlations would be significantly higher than those with the other IUS subscale (**IUS-US**) (showing **discriminant validity**)
- We expected that the **belief that uncertainty is unfair and spoils everything (IUS-US)** would show **convergent validity** and correlate with measures of:
 - self- and other-oriented **perfectionism** (MPS-SOP, MPS-OOP)
 - the **need for closure** (NFC; in particular a preference for order & predictability)
 - a **monitoring** coping style (MBSS-M)

... and these correlations would be significantly higher than those with the **IUS-NI** (showing **discriminant validity**)

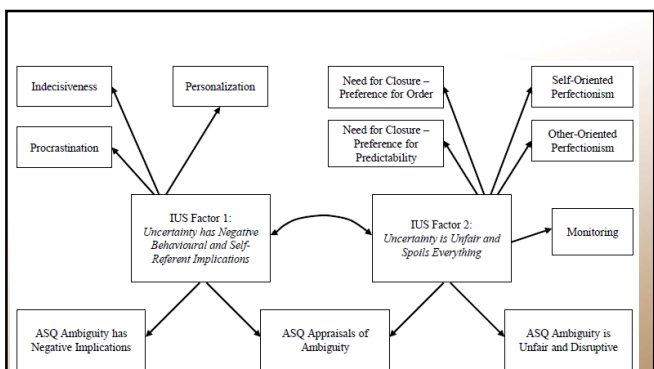


Figure 1. Hypothesized relationships between the IUS factors and the proposed convergent, discriminant, and criterion-related constructs.

To address study goal #3: IUS criterion-related validity Sample ASQ questions

- Ambiguous social situation (romantic relationships worry theme):
 - I went out on a date with a colleague. I wrote him/her an e-mail to say that I enjoyed myself; I'm still waiting to hear back from him/her.*
- How good or bad does this situation seem to you?

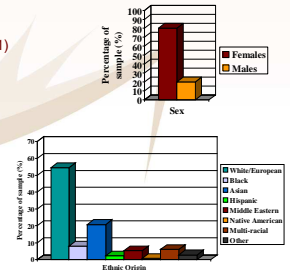
0 1 2 3 4 5 6 7 8
very good somewhat good neither good nor bad somewhat bad very bad
- In this situation, how likely would you be to react in the following way?:
 - I can't decide whether or not I should contact him/her again. (Subscale 1 question)*

0 1 2 3 4 5 6 7 8
Not at all Likely Somewhat Unlikely Neither Unlikely nor Likely Somewhat Likely Very Likely
- To what extent do you agree with the following statement?:
 - I am unimpressed that he/she is leaving me in the dark about whether he/she is interested in me. (Subscale 2 question)*

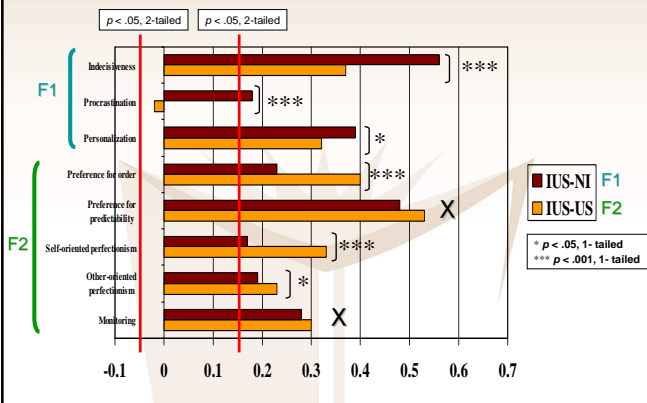
0 1 2 3 4 5 6 7 8
Completely Disagree Somewhat Disagree Neither Agree nor Disagree Somewhat Agree Completely Agree

Study 2 methods: Participants

- Survey conducted in two Canadian universities (N = 292):
 - Anxiety Disorders Laboratory at Concordia University in **Montreal**
 - N = 142 participants
 - Cognition & Psychopathology Laboratory at Ryerson University in **Toronto**
 - N = 150 participants
- Participant characteristics:
 - undergraduate student sample
 - aged 18 to 59 years (M = 22.4, SD = 6.1)
 - no significant differences in **age** or **sex** distribution between samples
 - first **language**:
 - 73.8% **English** (1 at Ryerson);
 - 5.2% **French** (1 at Concordia);
 - 21.0% **Other**
 - Canadian sample, with diverse **ethnic** backgrounds:
 - 1 proportion of **Black & Asian** origin participants at Ryerson
 - 1 proportion of **White** origin participants at Concordia



Construct validity of the IUS subscales



To address study goal #3: Criterion-related validity & specificity of IUS subscales

- Validating the IUS Subscales against the ASQ...
 - ran **hierarchical regressions** predicting all three **ASQ** subscales:
 - Appraisals of Ambiguity (ASQ-A),
 - Interpretations that **Ambiguity has Negative Implications** (ASQ-NI)
 - & Interpretations that **Ambiguity is Unfair & Disruptive** (ASQ-UD)
 from the **IUS subscales**
 - Hypotheses**:
 - 1) expected **both** IUS subscales to be associated with more negative **appraisals** of ambiguous situations (no *a priori* hypotheses about specificity)
 - 2a) Expected **IUS-NI** to predict **ASQ-NI** (**concurrent criterion-related validity**)
 - 2b) Expected **IUS-NI** to predict **unique** variance in **ASQ-NI** over **IUS-US** (**specificity**)
 - 3a) Expected **IUS-US** to predict **ASQ-UD** (**concurrent criterion-related validity**)
 - 3b) Expected **IUS-US** to predict **unique** variance in **ASQ-UD** over **IUS-NI** (**specificity**)

Predicting appraisals of ambiguous situations

		ΔR^2	ΔF^2	<i>B</i>	<i>SE B</i>	<i>B</i>
Step 1		.18	64.41 ***			
	<i>IUS-US</i>			0.61	.08	.43 ***
Step 1		.21	76.97 ***			
	<i>IUS-NI</i>			0.60	0.07	.46 ***
Step 2		.01	5.16 *	0.26	0.12	.18 *
	<i>IUS-US</i>			0.42	0.11	.32 ***
	<i>IUS-NI</i>					

IUS-NI = Uncertainty has negative behavioural & self-referent implications.
IUS-US = Uncertainty is unfair and spoils everything.
 * $p < .05$; *** $p < .001$

Predicting perceptions of ambiguity as having negative implications (ASQ-NI)

		ΔR^2	ΔF^2	<i>B</i>	<i>SE B</i>	β
Step 1		.23	85.95 ***			
	<i>IUS-US</i>			1.36	0.15	.48 ***
Step 2		.13	57.61 ***			
	<i>IUS-US</i>			0.15	0.21	.05
	<i>IUS-NI</i>			1.45	0.19	.56 ***

IUS-NI = Uncertainty has negative behavioural & self-referent implications.
IUS-US = Uncertainty is unfair and spoils everything.
 *** $p < .001$

Predicting perceptions of ambiguity as unfair and disruptive (ASQ-UD)

		ΔR^2	ΔF^2	B	$SE B$	β
Step 1		.21	78.94 ***			
	IUS-NI			1.00	0.11	.46 ***
Step 2		.07	29.49 ***			
	IUS-NI			0.31	0.17	.14
	IUS-US			0.99	0.18	.42 ***

IUS-NI = Uncertainty has negative behavioural & self-referent implications.
 IUS-US = Uncertainty is unfair and spoils everything.

*** $p < .001$

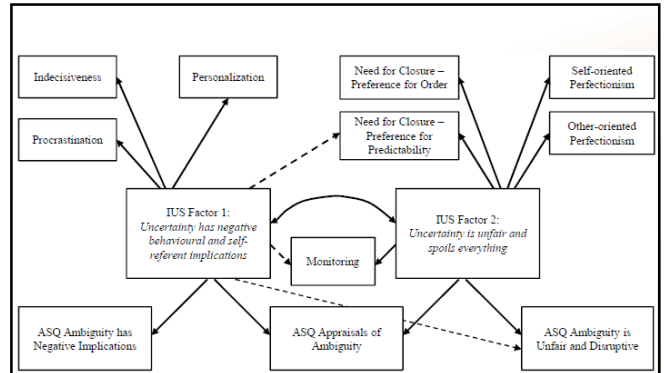


Figure 2. Observed relationships between the IUS factors and the proposed convergent, discriminant, and criterion-related constructs.

Final thoughts... some potential implications

- The **etiology of intolerance of uncertainty**
 - Having elucidated the *specific negative beliefs that result in IU* we can now take a closer look at how these beliefs develop
- Implications for **treatment**
 - Develop cognitive interventions to directly target these specific beliefs
 - Do individuals who hold one or other of these beliefs present differently in a treatment context?
 - If I believe...
 - that *Uncertainty has negative behavioural & self-referent implications*
 - or that *Uncertainty is unfair & spoils everything...*
 - would I show different emotional expressions (e.g., depressed mood, anger) as well as different behavioural manifestations?
 - » Do these beliefs account for patterns of comorbidity?
 - Would these subsets of individuals with GAD respond differently in treatment?
 - » Are externalized or internally-oriented beliefs perhaps more resistant to change?
 - » Do they show different patterns of change over the course of treatment?
 - » How can treatments be tailored accordingly?

Thank you!

Any questions?
 ksexton.cbt@gmail.com