

Part 1—You can run but you can't hide: Intrusive thoughts on six continents



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ABSTRACT

Most cognitive approaches for understanding and treating obsessive-compulsive disorder (OCD) rest on the assumption that nearly everyone experiences unwanted intrusive thoughts, images and impulses from time to time. These theories argue that the intrusions themselves are not problematic, unless they are misinterpreted and/or attempts are made to control them in maladaptive and/or unrealistic ways. Early research has shown unwanted intrusions to be present in the overwhelming majority of participants assessed, although this work was limited in that it took place largely in the US, the UK and other 'westernised' or 'developed' locations. We employed the International Intrusive Thoughts Interview Schedule (IITIS) to assess the nature and prevalence of intrusions in nonclinical populations, and used it to assess ($n=777$) university students at 15 sites in 13 countries across 6 continents. Results demonstrated that nearly all participants (93.6%) reported experiencing at least one intrusion during the previous three months. Doubting intrusions were the most commonly reported category of intrusive thoughts; whereas, repugnant intrusions (e.g., sexual, blasphemous, etc.) were the least commonly reported by participants. These and other results are discussed in terms of an international perspective on understanding and treating OCD.

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1. Introduction

One of the key tenets of most contemporary cognitive-behavioural theories of obsessive-compulsive disorder (OCD) is that

intrusive thoughts, images and impulses are normative, common – even ubiquitous occurrences experienced by individuals both with and without OCD (Bouvard & Cottraux, 1997; Clark & Purdon, 1993; Purdon & Clark, 1994; Rachman, 1997, 1998; Salkovskis, 1985). These theories generally posit that the intrusions themselves are not problematic, but rather that the ways we react to, interpret, appraise and/or attempt to control them can cause distress, fear, guilt, avoidance, compulsions (both overt and

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covert), as well as a host of other symptoms including an increase in the frequency and/or duration of the intrusions themselves.

Since the 1970s, several studies have shown that unwanted, intrusive thoughts, images and impulses are experienced by the overwhelming majority of participants tested (indeed, nearly all participants in most cases reported some form of intrusion) across a number of different research sites (e.g., Purdon & Clark, 1993; Rachman & de Silva, 1978; Salkovskis & Harrison, 1984). In their landmark paper, Rachman and de Silva first distributed a questionnaire to 124 nonclinical participants (including students and hospital employees) enquiring about the presence of unacceptable thoughts or impulses. Of the 124 individuals surveyed, 99 reported the presence of such intrusions, although an additional five were reclassified as having intrusions based on their unsolicited statements about the nature of their thoughts; a total of 104 (or 84% of the sample) individuals were determined to experience unacceptable thoughts or impulses. The authors further reported that in this sample, there were no age- or sex-related differences in the experience of intrusions. The second study reported in the article employed an interview-based assessment strategy to compare the unacceptable thoughts and impulses reported by clinical vs. nonclinical participants. Impressively, the content of intrusions reported by nonclinical participants was largely indistinguishable from that reported by clinical participants. Six ‘judges’ who had experience working with ‘obsessional patients’ were asked to indicate whether the reported intrusions originated from a clinical or nonclinical individual. Results indicated that although the judges could identify many of the nonclinical intrusions reasonably well, their performance at discerning the intrusions reported by clinical participants was poor. The authors also conducted a number of comparisons between normal and abnormal intrusions in terms of frequency, distress, resistance, and other factors. Rachman and de Silva concluded that although there were important differences between normal and abnormal intrusions in terms of frequency and distress, there were important similarities in content – and crucially, that unacceptable thoughts and impulses were very common among those without a clinical problem.

Several replications of the above study have been conducted (e.g., Purdon & Clark, 1993; Salkovskis & Harrison, 1984), and generally demonstrated similar, if not higher proportions of nonclinical individuals reporting unwanted intrusions (e.g., 88.2% in the study by Salkovskis & Harrison, 1984). That said, there has been recent theoretical and empirical work which challenges the universality of unwanted intrusive thoughts, images and impulses (e.g., O’Connor, 2002). One such study (which re-evaluated the data collected by Rachman and de Silva (1978)) found that psychologists were able to distinguish between clinical and non-clinical intrusions beyond chance levels (Rassin & Muris, 2007). In a second study, Rassin, Cogle, and Muris (2007) found that while nonclinical participants endorsed intrusions, these were primarily those intrusions originating from previously tested nonclinical individuals; those participants who endorsed intrusions originating from individuals with OCD tended to have higher levels of OCD symptoms.

Despite the exceptions noted above, the generally well-replicated finding that intrusions nearly identical to those reported by individuals with OCD are also nearly universally experienced by nonclinical individuals was the foundation for the development of a theoretical understanding of the nature of intrusions in OCD. How can (almost) everyone experience unwanted intrusions, while only some develop OCD? Rachman (1997, 1998) suggested that “obsessions are caused by catastrophic misinterpretations of the significance of one’s intrusive thoughts (images, impulses)” (Rachman, 1997, p. 793). Inspired by the misinterpretation-based theory of panic (Clark, 1986), this concise and causal theory has

been the subject of great interest (e.g., Abramowitz, Nelson, Rygwall, & Khandker, 2007; Newth & Rachman, 2001; Purdon, 2002; Rassin, Merckelbach, Muris, & Spaan, 1999; Salkovskis et al., 2000), and has led to a cohesive and effective treatment (Rachman, 2003; Whittal, Woody, McLean, Rachman, & Robichaud, 2010). Indeed, two of the six initial belief domains (i.e., beliefs about the importance of and control over one’s thoughts) proposed by the Obsessive Compulsive Cognitions Working Group (OCCWG, 1997) are closely associated with elements of this theory, and are often the target of both behavioural and cognitive interventions for OCD (e.g., Abramowitz, 2006a; Clark, 2004).

These and other investigations provided important empirical information about the nature of intrusions, and led many to address the question of why intrusions are only problematic for some and not for others. Responses to this question have been most fruitful, and comprise some of the most widely-used cognitive-behavioural approaches to understanding and treating obsessions and other forms of OCD. One of the limitations of this early work on obsessions was that the data were collected in a single city without regard to international or cultural differences that may influence the nature and/or number of intrusions that may be experienced and/or reported. Although some work has been done to elucidate and compare the experience of intrusions and other OCD-relevant phenomena in Italy (Sica, Novara, & Sanavio, 2002a, 2002b), and between Italy, the United States and Greece (Sica, Taylor, Arrindell, & Sanavio, 2006), there is a clear need to test the hypothesis that unwanted intrusive thoughts, images and impulses are present and common in nonclinical populations, across cultures, around the world. This was the primary aim of the current study. A secondary aim was to assess the prevalence and nature of not only the intrusions themselves, but also of the interpretations/appraisals of and control strategies used to attempt to regulate these intrusions, as these form the core of many cognitive-behavioural theories of OCD (a cross-cultural/international examination of these appraisals is reported in Moulding et al., 2014).

In our work toward these aims, we recognised a problem in some previously-used assessment strategies employed to detect intrusions: the use of paper-and-pencil self-report measures has the capacity to capture cognitive phenomena which either are not robustly intrusive (e.g., worry, rumination) or are not distinguishable from the examples provided in the measure’s instructions (a commonly reported problem with the Interpretation of Intrusions Inventory; OCCWG, 2001, 2003, 2005). Although distinguishing between intrusions, worry and rumination can be challenging (e.g., Clark & Claybourn, 1997; Langlois, Freeston, & Ladouceur, 2000; Wahl et al., 2011; Watkins, Moulds, & Mackintosh, 2005) we felt that the best way to ensure that our study captured unwanted intrusive thoughts (rather than worries, rumination or other cognitive phenomena) was to employ a semi-structured interview with highly-trained interviewers (see Clark and Radomsky (2014) for information about the history and development of the International Intrusive Thoughts Interview Schedule (IITIS; Research Consortium on Intrusive Fear; RCIF, 2007)).

2. Methods

2.1. Participants

Seven hundred and seventy-seven university student participants in 15 cities across 13 countries and six continents volunteered to participate in the current study. They were compensated with course credit or entry into a cash draw. The sites were located in Africa (Makeni, Sierra Leone), Asia (Herzliya, Israel; Hong Kong; Ankara, Turkey; and Tehran, Iran), Australia (Melbourne), Europe (Chambery, France; Firenze/Padova, Italy; Thessaloniki, Greece; and Valencia, Spain), North America (Binghamton and Chapel Hill, The United States; Fredericton and Montreal,

Table 1
Demographic information by site.

Continent	Country	Site	Age Mean	SD	Years of education Mean	SD	Sex % Female	Relationship status % Single
Africa	Sierra Leone	Makeni	31.70 ^{ac}	7.81	17.40 ^{aegkl}	1.08	13.0 ^{**}	39.1 [*]
Asia	Israel	Herzliya	25.03 ^{acg}	3.42	13.67 ^{bcdhij}	1.51	76.9	51.3 [*]
	China	Hong Kong	26.00 ^{ac}	4.39	16.16 ^{aefk}	1.23	50.9	90.9
	Turkey	Ankara	20.09 ^{bdef}	1.38	13.11 ^{bcdhj}	1.26	63.6	100.0
	Iran	Tehran	26.09 ^{cg}	4.96	–	–	36.4 [*]	72.7
Australia	Australia	Melbourne	22.48 ^{abcdefg}	7.92	14.15 ^{cdfhijk}	1.88	72.5	85.0
Europe	France	Chambery	20.01 ^{bdef}	1.68	13.01 ^{dh}	0.90	87.3 [*]	92.4
	Italy	Firenze/Padova	24.06 ^{acg}	2.61	16.41 ^{efgk}	1.49	70.0	100.0
	Greece	Thessaloniki	23.21 ^{abcdefg}	6.26	15.42 ^{fjk}	0.82	89.6 [*]	95.8
	Spain	Valencia	21.38 ^{defg}	2.68	18.32 ^{gl}	2.75	61.7	95.7
North America	United States	Binghampton	20.20 ^{ef}	2.42	13.84 ^{hij}	1.36	64.4	91.1
		Chapel Hill	19.09 ^f	2.19	14.38 ^{ijk}	0.95	61.8	100.0
	Canada	Fredericton	19.93 ^{bdefg}	3.92	14.27 ^{ijk}	1.68	66.7	91.1
		Montreal	23.15 ^{abcdefg}	5.64	15.85 ^k	1.97	90.0 ^{**}	85.0
South America	Argentina	Buenos Aires	22.78 ^g	2.56	18.38 ^l	2.43	46.0 [*]	62.0
Overall			22.68	5.01	15.21	2.41	65.7%	85.5%

Note: Values within each column which share the same superscripted letter were not significantly different from each other ($p > .003$, using a Bonferroni correction for 15 post-hoc analyses – 1 per site).

Note: *, ** indicates a significant difference from the expected z-score ($z > \pm 1.96$, and 2.58, respectively).

Canada) and South America (Buenos Aires, Argentina). Data characterising the participants were calculated after ineligible participants were excluded (see below). The mean age was 22.68 (ranging from 17 to 50 years of age) and the sample was 65.7% female. See Table 1 for additional participant characteristics.

2.2. Measures

The *International Intrusive Thoughts Interview Schedule Version 6* (IITIS; RCIF, 2007) is a 101-item structured interview developed by the RCIF to collect quantitative and qualitative information regarding individuals' experiences of, and appraisals and control strategies regarding, unwanted intrusive thoughts (UITs) across seven content areas (i.e., contamination, harm/injury/aggression, doubt, religious/immoral, sexual, victimization, and 'other' intrusions). Although only parts of the information gained from the interview are reported here, we describe the full structure/content of the interview below both to give a better context for the nature of the interview, and to inform other researchers about the focus and scope of the IITIS. The interview is available by request from the corresponding author, and will soon be made available online.

2.2.1. IITIS sections A–C: interview information, demographics, medication and psychiatric history.

The interview begins with a series of socio-demographic, medical, and psychiatric questions including sex, age, nationality, language, ethnicity, years of education, and relationship status. This portion of the IITIS concludes with questions regarding current physical and mental health conditions, medications, and treatments.

2.2.2. IITIS section D: definition and example of an unwanted intrusive thought

The interviewer reads aloud an in-depth, carefully worded description of unwanted intrusive thoughts (UITs) specifically designed to distinguish them from other forms of cognition (i.e., worries or rumination). The description includes a definition of a UIT, a series of examples spanning several content areas, and psychoeducation about the universality of these types of experiences. Participants are asked if they experienced this type of intrusion in the past three months. Importantly, a reference point for this time frame is established for use throughout the rest of the interview (e.g., "in the past three months, so since November 15, when you mentioned you started a new job...").

2.2.3. IITIS sections E–J: UIT content areas

The sections of the IITIS covering the various content areas comprise the bulk of the interview. The interviewer begins each section by providing a description of a

given content area, which includes a definition and examples of typical UITs of this type. For example, in section E: *contamination intrusions*, participants are asked

"In the past three months, have you have had unwanted intrusive thoughts, images, or feelings where you suddenly felt like you BECAME CONTAMINATED, DIRTY OR ILL by something you touched? For example you may have been in a SLIGHTLY DIRTY PUBLIC WASHROOM but you suddenly had the thought that you could catch some serious or dreadful disease".

If a participant describes a worry or other type of cognition that is not intrusive, the interviewer clarifies the definition and nature of intrusive thoughts and provides the participant with another opportunity to respond. If a participant denies the presence of an intrusion within a particular content area in question, the interviewer proceeds to the next content area.

If a participant reports experiencing an intrusion in a given content area, the interviewer then records verbatim the participant's description. In addition, the interviewer queries as to the form of the intrusion (i.e., a thought, image, impulse, or feeling) as well as the perceived anticipated consequences of having such a thought. The interviewer is given instructions on how to follow-up a questionable intrusion with probes to determine whether the respondent has reported an authentic intrusive thought or not.

The participant reports on the frequency, distress/interference, importance of removing, and difficulty in removing the relevant UIT type, using a six-point rating scale. A paper copy of the *Participant Rating Scale Sheet* is provided to the participant for ease of reference and to increase the efficiency of the interview. Scores for the above items range from 0 to 5, where 0 indicates 'never/not', and 5 indicates 'frequently/extremely'. The internal consistencies of these item sets were adequate to good across all content areas ($\alpha = .72$ for contamination, $\alpha = .72$ for harm/injury/aggression, $\alpha = .73$ for doubt, $\alpha = .67$ for religious/immoral, $\alpha = .78$ for sexual, $\alpha = .70$ for victimization, $\alpha = .70$ for 'other').

2.2.4. IITIS section L: most distressing UIT

If, after having covered each of the seven content areas, a participant has denied the presence of any type of intrusion, the interview is concluded. If a participant has reported having experienced at least one type of intrusion in the past three months, she/he is asked to indicate which type of intrusion was most distressing, using the six-point distress ratings as a guide for item selection, if needed. All subsequent interview items are asked with reference to the most distressing UIT (MD-UIT) type.

2.2.5. IITIS section M: appraisals of the MD-UIT

In this section, participants rated the extent to which they agree with nine theoretical and evidence-based appraisal dimensions regarding the meaning and importance of the MD-UIT (i.e., overestimation of threat, importance of thought, intolerance of anxiety/distress, need to control, responsibility, intolerance of uncertainty, perfectionism, thought-action fusion and ego-dystonicity). For example, for the 'overestimation of threat' item, the interviewer asks "Was the thought noticeable because it involved a possible threat of some kind to yourself or to others?". Participants answer referencing a 6 point scale (again, a *Participant Rating Scale Sheet* is provided in hard copy for reference) from 0 to 5, where a score of '0' indicates the appraisal is 'not at all' characteristic of their interpretation of the MD-UIT type, and a score of '5' indicates the appraisal is 'absolutely' characteristic of their interpretation of their MD-UIT type. When combining these items into a single "appraisal" rating, they had good internal consistency in the present sample ($\alpha=.75$).

2.2.6. IITIS section N: control strategies used for the MD-UIT

Participants then rate the degree to which they endorse nine evidence-based, theoretically-relevant types of mental and behavioural control strategies used to cope with the MD-UIT (i.e., distraction, thought replacement, thought stopping, self-reassurance, reassurance seeking, ritualising, neutralization, rationalisation, avoidance). For example, for the 'distraction' item, the interviewer asks "How often have you used the following strategy in an attempt to gain control over the distressing intrusive thought – 'try to distract myself with activity?'". Participants answer referencing a 6 point scale from 0 to 5, where a score of '0' indicates the control strategy is 'never' used in response to their most distressing UIT, and a score of '5' indicates the control strategy is 'frequently' used in response to their MD-UIT. The internal consistency of this set of items in the present sample was good ($\alpha=.74$).

The interviewer asks one additional question regarding what we conceptualise as the opposite, or lack of a control strategy (i.e., how frequently the participant 'does nothing' in response to their most distressing UIT). The control strategy rating scale is used to respond to this item.

2.2.7. IITIS section O: failures of control

The interviewer concludes the IITIS by asking participants if they have ever experienced a 'failure' of control (i.e., "Do you recall an occasion when you had any difficulty stopping yourself from thinking about the distressing thought over and over"). If the participant denies such an experience, the interview ends; if the participant reports having experienced this, the interviewer asks him/her to describe it and to respond to six theoretically-derived appraisal dimensions (misinterpretation of control significance, thought-action fusion, possibility inference, unrealistic control expectations, inflated responsibility, and faulty inference of control) regarding this failure. For example, for the 'misinterpretation of control significance' item, the interviewer asks "When you had difficulty controlling the distressing intrusion, did you consider this a significant failing on your part?". Participants answer referencing a 6 point scale from 0 to 5, where a score of '0' indicates the item is 'not at all' representative of their reaction to such a failure, and a score of '5' indicates the item is 'absolutely' representative of their reaction to such a failure to control the MD-UIT. When combining these items, they had good internal consistency in the present sample ($\alpha=.72$).

2.2.8. IITIS section P: interviewer comments

The interview includes a section for recording comments or observations that the interviewer perceives to be pertinent to the interpretation of the participant's responses (i.e., where some aspect of the interview deviated from the standard/typical administration).

For the self-report questionnaire measures that follow, published translations with established norms (and psychometrics where possible) were used when available. In cases where the following measures were not available in the language of testing in a particular site, the same translation/back-translation protocol used for the IITIS (see Clark & Radomsky, 2014) was employed.

The *Obsessive-Compulsive Inventory – Revised* (OCI-R; Foa et al., 2002) is an 18-item self-report questionnaire using a 0–4 point scale from 'not at all' to 'extremely' that assesses symptoms of OCD using six subscales (washing, obsessing, hoarding, ordering, checking, and neutralising). It has excellent psychometric properties. The total scale has very good to excellent internal consistency (α 's = .89–.93), good to excellent retest reliability over a two-week period (r 's = .74–.91), and demonstrates good convergent and discriminant validity. It was administered in the current study to assess OCD symptoms and to determine whether or not the sample was indeed non-clinical in nature. The internal consistency in the current sample was very good ($\alpha=.90$).

The *Obsessional Beliefs Questionnaire* (OBQ-44; OCCWG, 2005) is a 44-item self-report questionnaire that assesses six belief domains theoretically linked to OCD symptoms using a 7-point scale from 'disagree very much' to 'agree very much'. These six domains are contained within three factors: (1) inflated responsibility and over-estimation of threat, (2) perfectionism and intolerance of uncertainty, and (3) importance of and control over thoughts. It has very good to excellent internal consistency (α 's = .89–.93 across subscales), criterion, convergent, and discriminant

validity (OCCWG, 2005). It was administered to measure the nature and presence of these beliefs in the sample. The internal consistency in the current sample was excellent ($\alpha=.94$).

The *Depression Anxiety Stress Scale – Short Version* (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report questionnaire that assesses the occurrence of three types of symptoms over the past week: depression, anxiety and stress, using a 4-point scale that ranges from 0 ('did not apply to me at all') to 3 ('applied to me very much or most of the time'). It exhibits good convergent and discriminant validity (Lovibond & Lovibond, 1995), as well as internal consistency (α 's = .87–.94; Antony, Bieling, Cox, Enns, & Swinson, 1998). In the current study, the DASS-21 was administered to measure the nature and presence of these symptoms, and had internal consistencies in very good to excellent range (α 's = .81, .79, and .81, for the depression, anxiety, and stress subscales, respectively).

2.3. Procedure

Well-trained interviewers administered the IITIS (RCIF, 2007) individually to consenting participants in a quiet office or laboratory setting. The interviewer was either the site's Principal Investigator (PI) or a member of the research team who had been highly trained by the site's PI on the administration of the IITIS. Training involved not only a number of interview practice trials, but also included significant information about the nature and content of both clinical and nonclinical intrusions previously reported in the literature. At most sites, the second interviewers were graduate-level students engaged in the study of OCD or related problems. Participants then completed the OCI-R, OBQ, and DASS-21 either on paper or via a web browser using online survey software, before being fully debriefed.

3. Results

3.1. Participant characteristics

Mean scores on the OCI-R ($M=15.80$, $SD=11.31$) and the OBQ-44 ($M=138.68$, $SD=39.37$) corresponded with published student sample norms (Foa et al., 2002; OCCWG, 2005). Mean scores on the DASS-21 depression ($M=7.78$, $SD=7.25$), anxiety ($M=6.58$, $SD=6.80$), and stress ($M=12.24$, $SD=8.00$) subscales were slightly higher than published community norms, but well below published norms for clinical samples (Antony et al., 1998).

Demographic characteristics (age, years of education, sex, and relationship status) for each site are displayed in Table 1. The results of two one-way ANOVAs (with site as the independent variable and age and years of education as the respective dependent variables) were significant, indicating that there were differences across sites with respect to mean age ($F(14,668)=21.50$, $p<.001$) and number of years of education, ($F(13,624)=60.99$, $p<.001$). Post-hoc analyses (using a Bonferroni correction to control for inflated *Type I error* due to repeated testing) were conducted to discern which specific sites differed from each other (see Table 1).

There were also differences across sites with respect to number of females ($\chi(14)=102.27$, $p<.001$), and number of individuals who were single (as opposed to cohabitating, married, divorced, or widowed; $\chi(42)=267.35$, $p<.001$). Follow-up analyses to determine which sites differed were conducted by examining the standardized residuals of the chi-square statistic (i.e., the difference between the expected frequency in each category as predicted by the model and the actual frequency in the data). These values are z-scores, and as such can be used to determine whether or not the reported frequency in a given category differed significantly from the expected frequency, and to what degree (Field, 2009). With regard to gender differences across sites, these post-hoc examinations revealed that there were significantly fewer female participants than expected at the Makeni ($z=-3.1$, $p<.01$) and Tehran ($z=-2.4$, $p<.05$) sites and, similarly, significantly more males than expected at the Buenos Aires site ($z=2.4$, $p<.05$; see Table 1). There were also significantly more female participants than expected at the Chambery ($z=2.4$, $p<.05$) and Thessaloniki ($z=2.0$, $p<.05$) sites, and, similarly, significantly fewer male participants than expected at the Montreal site

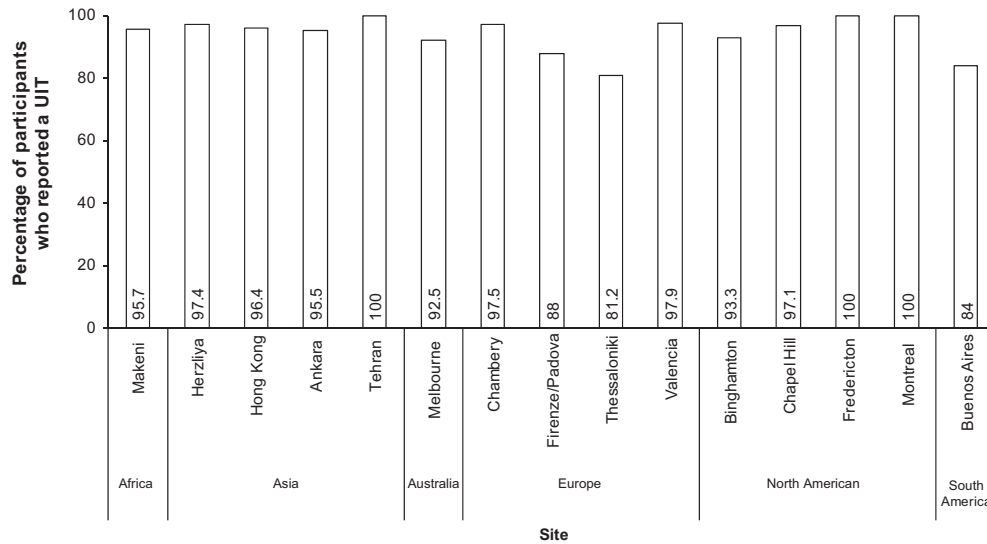


Fig. 1. Percentage of participants at each site who reported at least one UIT within the last three months.

($z = -2.6, p < .01$; see Table 1). With regard to relationship status, there were significantly fewer single individuals than expected at the Makeni ($z = -2.4, p < .05$) and Herzliya ($z = -2.3, p < .05$) sites (see Table 1).

3.2. Data cleaning and missing data

Participants who were not citizens of the country in which they were tested were removed, in order that any site differences found would be more easily interpretable. It was also decided to remove participants from the dataset who were currently diagnosed with a mental disorder, in order to preserve the non-clinical status of the sample. A total of 94 participants across sites were removed for these reasons, resulting in a final sample of $N = 683$.

Mean replacement was used for questionnaire items only, provided that data from other individuals at the same site were available. Otherwise, data were coded as missing, as were any other numeric missing data points from the IITIS (i.e., ratings of the frequency, interference, importance, and difficulty removing UITs, as well as appraisal and control items). Overall, less than 2% of the quantitative were missing.

3.3. Prevalence of UITs

Overall, 94.3% of the international sample reported at least one type of unwanted intrusive thought in the previous three month period (see Fig. 1 for breakdown by site). At most sites, over 90% of participants reported at least one type of UIT. In North America, there were two sites (Fredericton and Montreal) where 100% of participants reported at least one UIT, as did participants in Tehran. On the lower end, at a few sites, only about 80% of participants reported having experienced at least one UIT type, including Firenze/Padova and Thessaloniki in Europe, and Buenos Aires in South America. Most participants reported experiencing more than one type of UIT, however. Across the full data set, participants endorsed a mean of 2.77 intrusive thought content areas ($SD = 1.61$, range of 0–8 content areas), although there were significant differences in the mean number of UIT types reported across sites ($F(14,668) = 14.20, p < .001$). Participants at Chapel Hill endorsed the highest mean number of content areas ($M = 4.41$; $SD = 1.81$), while those in Thessaloniki endorsed the fewest ($M = 1.38$; $SD = 1.13$). Post-hoc analyses revealed which sites were significantly different from each other in this respect (see Table 2).

Table 2

Mean number of UIT content areas endorsed by participants by site.

Continent	Country	Site	# of UIT types Mean
Africa	Sierra Leone	Makeni	2.65 ^{abcdefgiklm}
Asia	Israel	Herzliya	2.77 ^{abcdefgijklm}
	China	Hong Kong	3.09 ^{bcdefgijkl}
	Turkey	Ankara	3.23 ^{cdefgijkl}
	Iran	Tehran	2.34 ^{defghilm}
Australia	Australia	Melbourne	2.48 ^{efghiklm}
Europe	France	Chambery	2.99 ^{fgijkl}
	Italy	Firenze/Padova	2.04 ^{ghim}
	Greece	Thessaloniki	1.38 ^{hm}
	Spain	Valencia	2.91 ^{ijkl}
North America	United States	Binghamton	2.62 ^{abcdefghijklm}
		Chapel Hill	4.41 ^{ijkl}
	Canada	Fredericton	3.93 ^{kl}
		Montreal	3.63 ^l
South America	Argentina	Buenos Aires	1.56 ^m
Overall			2.77

Note: Values within each column which share the same superscripted letter were not significantly different from each other ($p > .003$, using a Bonferroni correction for 15 post-hoc analyses – 1 per site).

3.4. Types of UITs

The proportionate prevalence of UIT category endorsement across sites is displayed in Fig. 2. By-and-large, doubting intrusions were the most common, while UITs regarding sex, religion, and immorality were the least common. A surprisingly large proportion of ‘other’ UITs were endorsed. Despite these overall trends, there were many significant differences across sites with regard to the proportion of individuals who endorsed each category across sites. These were identified using chi-square tests assessing differences between sites on the expected number of individuals who endorsed each category. For example, there were more individuals in Makeni who reported UITs of contamination ($z = 3.30, p < .001$) than at other sites, and fewer individuals in

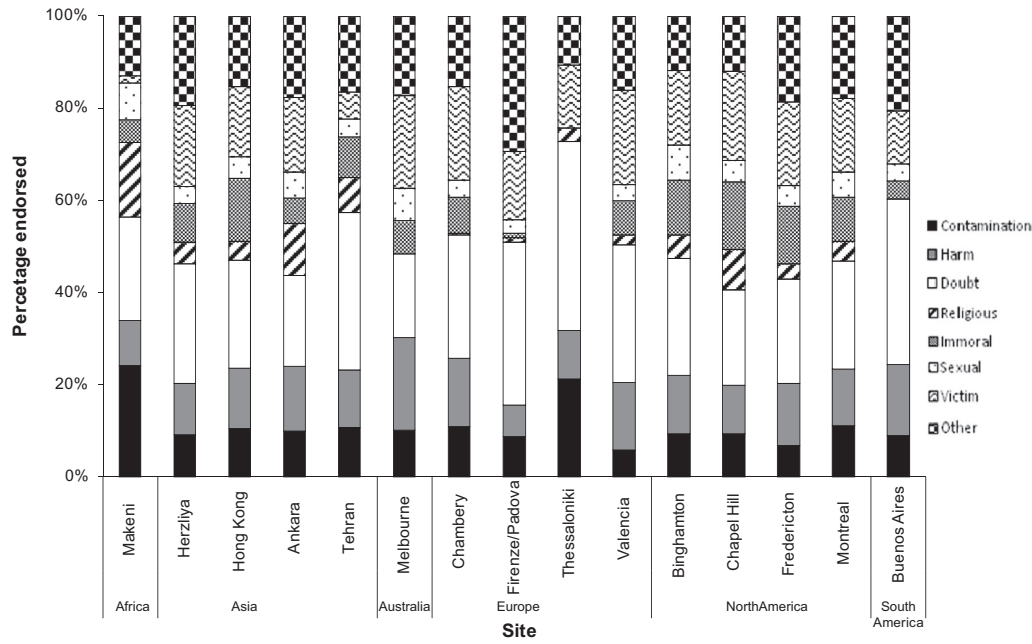


Fig. 2. Prevalence of UIT by category across sites.

Table 3
Site differences on prevalence of UIT endorsement by category.

UIT Category	Difference?	More individuals	Fewer individuals
Contamination	$\chi^2(14)=33.94, p < .01$	Makeni***	–
Harm	$\chi^2(14)=43.28, p < .001$	–	Firenze/Padova**, Thessaloniki*
Doubt	$\chi^2(14)=55.45, p < .001$	Fredericton*, Valencia*, Chapel Hill*	Melbourne***, Thessaloniki*, Buenos Aires*
Religious	$\chi^2(14)=99.84, p < .001$	Ankara***, Chapel Hill***, Makeni***	Melbourne*, Firenze/Padova*, Buenos Aires*, Chambery**
Immoral	$\chi^2(14)=102.52, p < .001$	Fredericton***, Hong Kong**, Chapel Hill***	Firenze/Padova**, Thessaloniki***, Buenos Aires**
Sexual	$\chi^2(14)=22.79, p > .05$	–	–
Victim	$\chi^2(14)=116.51, p < .001$	Fredericton**, Chapel Hill***, Chambery*	Thessaloniki**, Buenos Aires** Tehran**, Makeni**
Other	$\chi^2(14)=56.34, p < .001$	Fredericton**	Thessaloniki**

Note: *Indicates a z-score $< \pm 1.96$, and whose p-value is therefore $< .05$; **Indicates a z-score $< \pm 2.58$ and whose p-value is therefore $< .01$; ***Indicates a z-score $< \pm 3.29$ and whose p-value is therefore $< .001$.

Firenze/Padova and Thessaloniki who reported UITs of injury/harm/aggression than at other sites ($z = -2.6, p < .01$, and $z = -2.5, p < .05$, respectively; see Table 3).

3.5. Types of most distressing-UITs (MD-UITs)

Fig. 3 shows the prevalence of the MD-UIT category endorsement across sites. Similar to the distribution of UITs, the content area most commonly reported as comprising the most-distressing intrusion was doubt, while sexual and religious/immoral MD-UITs were the least commonly reported. The amount of endorsement in the ‘other’ and victim categories varied between sites. Not surprisingly, there were significant site differences with regard to the proportion of individuals who endorsed each category as their MD-UIT across site ($\chi^2(84)=154.73, p < .001$). Relative to other sites, significantly more individuals in Ankara and Thessaloniki experienced MD-UITs of contamination ($z=2.0, p < .05$, and $z=3.4,$

$p < .001$, respectively); significantly more individuals in Chambery experienced MD-UITs of harm/injury/aggression ($z=2.3, p < .05$); in Hong Kong religious or immoral UITs were more endorsed as most distressing ($z=2.3, p < .05$); while in Makeni and in Montreal sexual MD-UITs were more endorsed ($z=4.6, p < .001$, and $z=2.0, p < .05$, respectively).

3.6. Characteristics of MD-UITs

The mean levels of endorsements for associated frequency, interference/distress, importance of removing, and difficulty removing the most distressing intrusive thought across each UIT category can be seen in Table 4. As the IITIS provides similar treatment to the areas of religious and immoral intrusions, if participants reported both of these types of UITs, they responded about the more distressing of the two; thus, these two categories are collapsed for these items. A series of one-way ANOVAs

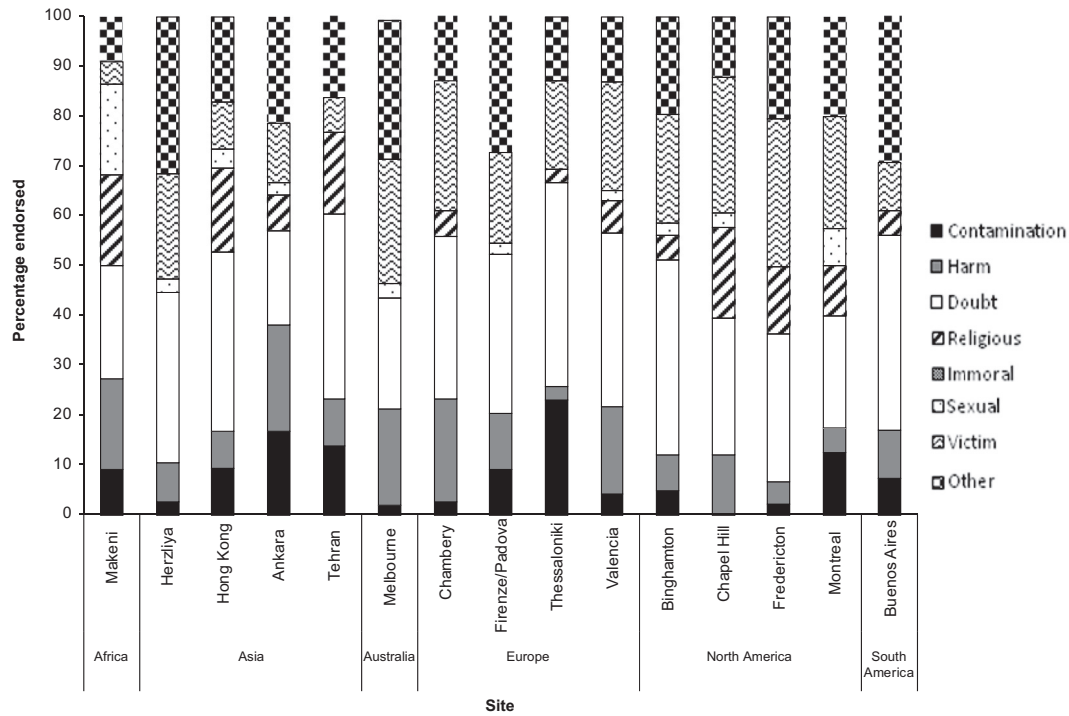


Fig. 3. Prevalence of MD UIT by category across sites.

Table 4

Means and standard deviations for ratings of the frequency, distress/interference, importance of removing, and difficulty removing the MD-UITs by category, as rated on a 0- to 5-point scale.

UIT category	Frequency		Distress/Interference		Importance of removing		Difficulty removing	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Contamination	3.36 ^{abcde}	1.31	2.56	1.26	2.72	1.68	1.78 ^a	1.48
Harm	2.86 ^{bde}	1.13	2.18	1.45	2.82	1.55	2.30 ^{ab}	1.52
Doubt	3.47 ^c	1.13	2.33	1.30	2.86	1.33	2.34 ^{ab}	1.37
Religious/Immoral	2.58 ^{de}	1.09	2.62	1.40	2.98	1.45	2.32 ^{ab}	1.38
Sexual	2.69 ^{abcde}	1.14	3.13	1.31	3.62	1.20	2.75 ^{ab}	1.12
Victim	2.74 ^e	1.06	2.34	1.32	3.07	1.40	2.45 ^{ab}	1.41
Other	3.28 ^{abc}	1.14	2.59	1.28	3.06	1.46	2.78 ^b	1.38

Note: Values within each column which share the same superscripted letter were not significantly different from each other ($p > .007$, using a Bonferroni correction for 7 post-hoc analyses – 1 per MD-UIT type).

revealed significant differences between content areas in mean levels of frequency of the MD-UIT ($F(6,631)=9.28, p < .001$) and difficulty in removing the MD-UIT ($F(6,631)=3.48, p < .01$), but not on distress and interference ($F(6,631)=2.02, p = .062$) or importance of removing the MD-UIT ($F(6,631)=1.33, p = .242$). Follow-up post-hoc analyses revealed that participants who endorsed the ‘other’ category had more difficulty removing the MD-UIT than those who had endorsed other content areas (see Table 4), especially contamination.

3.7. Appraisal and control strategies

Finally, mean ratings on the appraisal items varied somewhat across sites (see Fig. 4 and Table 5). Participants more strongly endorsed interpretations of intolerance of anxiety, importance of the thought, overestimation of threat, the need to control the thought, and appraisals of responsibility as reasons that they ‘noticed’ the thought; while participants endorsed interpretations of perfectionism, ego-dystonicity, and thought-action fusion to a

lesser extent. Endorsement of the thought control strategies also varied (see Fig. 5 and Table 5); participants were more likely to use self-reassurance, thought stopping, reasoning, thought replacement, and distraction, than avoidance, neutralization, ritualising, and reassurance seeking.

4. Discussion

The main aims of this study were to examine, in a large international context, some of the fundamental components of cognitive theory as it applies to obsessions – namely that unwanted intrusive thoughts, images and impulses are extremely common, as are the types of appraisals and control strategies proposed to operate in OCD (e.g., Clark & Purdon, 1993; Rachman, 1997, 1998). A failure to detect high levels of UITs in an international context (or for that matter to detect maladaptive appraisals and control strategies) would raise serious questions about cognitive models of obsessions and OCD. These models were largely generated in highly-developed, English-speaking countries, and have rarely been studied cross-nationally or cross-culturally. Since OCD is known to exist throughout the world (Ayuso-Mateos, 2000; Nedeljkovic, Moulding, Foroughi, Kyrios, & Doron, 2012), our primary aim was to examine whether the essential intrusive, cognitive and behavioural elements of obsessions could be assessed in a non-clinical sample across six different continents. Indeed, this is the largest and most diverse study of UITs of which we are aware.

Consistent with earlier work dating back to the seminal study of UITs by Rachman and de Silva (1978), we found that nearly all (93.6%) participants reported experiencing a UIT at some point during the previous three months. Further, the sorts of appraisals and control strategies observed in individuals with OCD were also endorsed across all sites in the current study. This provides some degree of confidence that cognitive models of obsessions may hold cross-nationally and cross-culturally. Although the current study can be seen as a replication and extension of previous work examining the prevalence of UITs in nonclinical samples, our

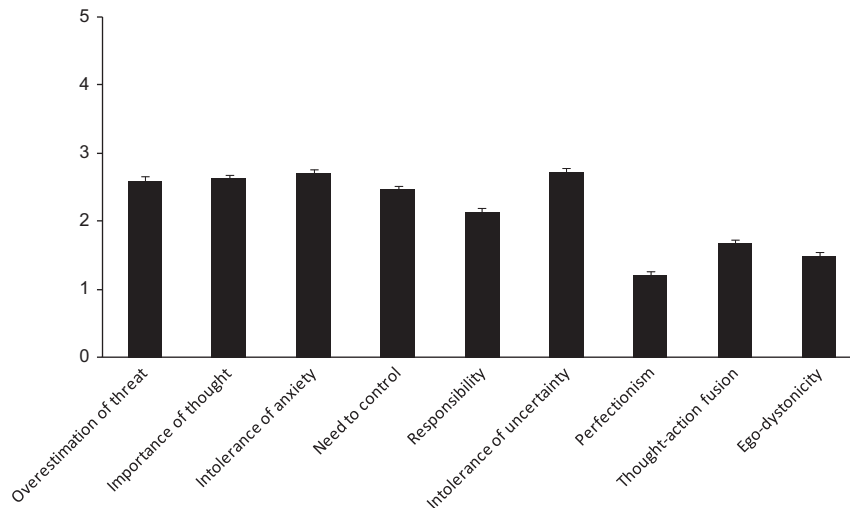


Fig. 4. Mean ratings for each appraisal item.

Table 5

Appraisal and control item means and standard deviations.

Appraisal	Mean	SD
Overestimation of threat	2.59	1.76
Importance of thought	2.62	1.53
Intolerance of anxiety	2.70	1.64
Need to control	2.46	1.62
Responsibility	2.13	1.80
Intolerance of uncertainty	2.72	1.63
Perfectionism	1.21	1.58
Thought-action fusion	1.67	1.68
Ego-dystonicity	1.49	1.72
Control strategy		
Distraction	2.18	1.64
Thought replacement	2.41	1.63
Thought stopping	2.48	1.72
Self-reassurance	2.61	1.66
Reassurance seeking	1.22	1.54
Ritualising	1.16	1.72
Neutralization	1.64	1.61
Rationalisation	2.46	1.61
Avoidance	1.46	1.62

results are strengthened by key aspects of our methodology; namely the rigorous strategies employed in developing the IITIS (Clark & Radomsky, 2014), the extensive training of interviewers, and the involvement of a number of senior investigators in the collection of data.

Our data suggest far more similarities than differences across sites regarding the experience of UITs, which supports a broad extension of the tenets of cognitive theory beyond westernised/developed countries. Yet, although the rates of UITs were high across sites and countries, we found some relatively small differences in the nature and content of UITs. For example, while 100% of the participants from Fredericton, Montreal, and Tehran reported at least one UIT within the previous 90 days, only 81.2% of those from Thessaloniki reported UITs during the same time-frame. While such findings might reflect meaningful international or cross-cultural differences (e.g., cultural influences such as religion) in how UITs are experienced and reported (e.g., willingness to discuss UITs with an interviewer) that deserve further research, they might also be the result of subtle methodological differences across sites (e.g., how the interview was translated or administered). Regardless, future investigators may wish to employ measures designed to assess elements of culture which

may pertain to site differences (e.g., ethnicity, socioeconomic status, collectivism vs. individualism, differences in personal values across cultures, etc.) since the present study was designed merely to assess for the occurrence of UITs in a preliminary way, and not to elucidate site-, country-, or culture-specific differences in the frequency, distress, or interference associated with such phenomena. It may be helpful to consider not only the cultural diversity of participants, but also of the research team, to facilitate maximal cultural sensitivity to the consideration and/or interpretation of any obtained findings.

Some of the findings we observed, however, do warrant specific discussion – particularly those which were unexpected. The first of these was the overwhelming prevalence of doubting intrusions compared to all other types of UITs. At nearly every site, doubting intrusions were the most commonly endorsed category. Although highly consistent with at least one previous investigation (García-Soriano, Belloch, Morillo, & Clark, 2011), this finding was discussed at length by the study authors, as it could reflect conceptual or methodological issues (e.g., were any doubts about cleanliness mistakenly coded as doubting intrusions? – this did not appear to be the case). Once we were satisfied that this finding was valid, some theoretical implications were raised. Are doubting intrusions so markedly prevalent in non-clinical individuals? If so, as a species, we generally seem to demonstrate an extraordinary resilience to such doubts. This would appear to support the role of intolerance of uncertainty in the development and maintenance of clinically severe obsessional symptoms (e.g., OCCWG, 2005; Tolin, Abramowitz, Brigidi, & Foa, 2003). This represents an important area in need for further exploration both within the current dataset, and for future investigators, particularly those whose work has focused on the priority of doubt in the context of OCD (e.g., Alcolado & Radomsky, 2011; Ferrão et al., 2012; Gentsch, Schütz-Bosbach, Endrass, & Kathmann, 2012; Ghisi, Chiri, Marchetti, Sanavio, & Sica, 2010; O'Connor, Aardema, & Pélissier, 2005; Prado et al., 2008; Radomsky & Alcolado, 2010).

Second, we found that repugnant UITs (e.g., sexual, immoral, blasphemous) were the least frequently reported, but among the most difficult to control. Conversely, doubting UITs were the most commonly reported, but the easiest to control. Although it is possible that some of these differences relate to varying degrees of comfort participants may have felt about reporting repugnant vs. other UITs, they also lend themselves well to differences in cognitive-behavioural theories of, and interventions for OCD (for a more detailed examination of the relationships between appraisals/misinterpretations and UITs, (see Moulding et al., 2014).

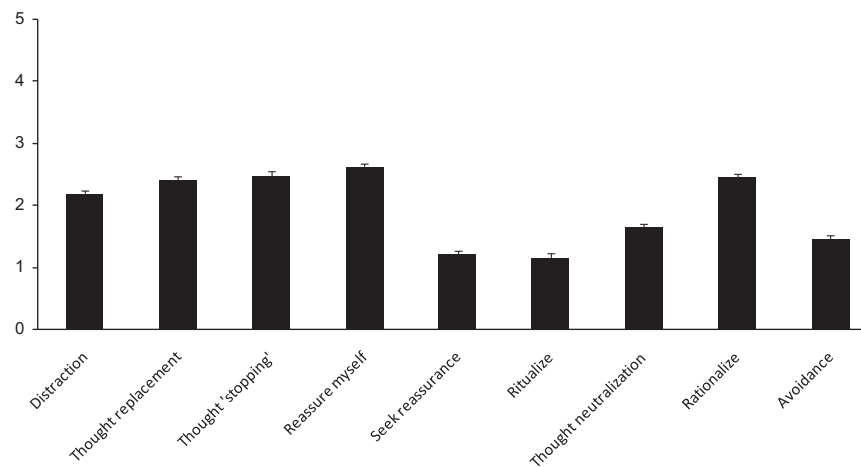


Fig. 5. Mean ratings for each control strategy.

In terms of treatment, it is well known that both exposure-and response prevention (ERP) and cognitively-based treatments can lead to reductions in behavioural and cognitive aspects of OCD symptomatology (Abramowitz, 2006b; Freeston et al., 1997; Whittal et al., 2010). Repugnant obsessions (or more specifically, the interpretations and strategies used to control them) are often more directly targeted in treatment, particularly when they are not associated with overt compulsions (Rachman, 2003); someone presenting with doubting obsessions on the other hand would likely find that their compulsions (e.g., checking, reassurance seeking) were a primary/additional target of treatment either in the context of ERP or of a more cognitively-based intervention (see Radomsky, Shafran, Coughtrey, & Rachman, 2010 for an example specifically related to doubting and checking).

One other finding worth explicitly mentioning is the high prevalence of miscellaneous intrusions reported across most sites. During the development of the IITIS we paid special attention to capturing what we believed would be the most common types of UITs endorsed in a non-clinical sample (as evidenced by the relatively un-used category of thoughts associated with being a victim of violence). The miscellaneous category was designed to pick up the occasional earworm/song 'stuck' in one's head, or numbers or other random ideas that people found to be intrusive. Instead, this category captured a surprising number of endorsements. A preliminary look at the qualitative data shows that many of these were intrusions very similar to the examples provided in the interview (differing importantly from the other categories where the examples were not mirrored in participants' responses). Closer examination of this category, however, falls outside the scope of the present paper – we plan a more detailed examination of these UITs, including potentially generating new categories of intrusions to be included in future versions of the IITIS.

There are a number of important limitations associated with the current research. The most prominent drawback is the possibility that, as mentioned, subtle site-to-site differences in translation, administration, coding and/or data entry are responsible for observed differences rather than actual differences evident in the sample assessed by the study's interviewers. In fact, it would be impossible to ascertain in the current study whether observed differences were indicative of culture or of methodology; as such, these results should be interpreted with caution. We attempted to control for this by employing highly rigorous translation, training, administration, coding and data entry protocols across all sites, and by ensuring that for nearly every site, one of the interviewers was an established faculty-level OCD researcher.

A second limitation involves the interview itself; the IITIS contains examples and clarifications designed to illustrate the intrusive nature of UITs, as well as their prevalence across all of the employed categories. It is therefore possible that this generated demand characteristics or led participants to endorse specific types of UITs simply because of the nature of the interview. We attempted to offset this possibility by telling participants that they may or may not have experienced UITs in the previous three months, and by examining – at least superficially – the qualitative responses provided by participants (indeed, this may turn out to be an issue with respect to the category of "other" intrusions).

Similarly, it is possible that although we tried to elicit only intrusive thoughts (rather than worries or rumination), some participants reported upsetting thoughts that were not intrusive in nature. Interviewers were trained to detect the differences between these different types of cognition, but in some cases, boundaries between them can be unclear, as can be some of the participants' descriptions. The study only tested university students, who can normally be considered to have a high level of functioning; future researchers may wish to assess a community sample. A final limitation of the current work is that no measure of culturally-relevant constructs was administered. This limits our ability (indeed, it may well prevent it) to make cultural-specific interpretations or conclusions based on the observed results. Future investigators may wish to include assessment of culturally-relevant constructs in order to explore associations between elements of the IITIS and culture.

There are a number of important future directions to which this research points. The simplest – yet perhaps most interesting of these would be to employ the IITIS in additional countries and cultures in order to determine whether indeed these findings hold true for all peoples. Although this may seem daunting, the implication would be that cognitive theory holds for all of us – that intrusions are a normal and ubiquitous aspect of human cognition. Theoretically-driven directions have been taken up by our group in two other papers in the current issue. These include an assessment of how intrusions relate to appraisal and control strategies across the sites studied in this research (Moulding et al., 2014), and to examine the degree to which self-reported OCD symptoms are associated with elements of the interview (Clark et al., 2014). These will provide important tests of current cognitive theories of OCD, and will also set the stage for more detailed work on this subject.

In the interim, our findings suggest that clinicians and researchers can consider that after over 35 years of study on

'normal obsessions', this phenomenon is extremely common just about everywhere it has been examined. Consistent with cognitive theory, our view is that it is not the intrusion that is the problem, but the ways that we interpret and try to control it that determine whether it will become problematic, more frequent, more distressing over time. These are of course empirical questions, and these factors are among those assessed and reviewed by the upcoming papers in this series.

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