Available online at www.sciencedirect.com
SCIENCE DIRECT®
Behaviour Research and Therapy 43 (2005) 999–1010
BEHAVIOUR RESEARCH AND THERAPY
www.elsevier.com/locate/brat

A comparison of autogenous/reactive obsessions and worry in a nonclinical population: a test of the continuum hypothesis

Han-Joo Lee[a], Soon-Hee Lee[b], Hyang-Suk Kim[b], Seok-Man Kwon[b], Michael J. Telch[a,*]

[a]*Laboratory for the Study of Anxiety Disorders, Department of Psychology, University of Texas at Austin, 1 University Station A8000, Austin, TX 79712 0187, USA*
[b]*Laboratory of Abnormal Psychology, Seoul National University, South Korea*

Received 20 January 2004; received in revised form 3 June 2004; accepted 21 June 2004

Abstract

Employing the autogenous–reactive model of obsessions (Behaviour Research and Therapy 41 (2003) 11–29), this study sought to test a hypothesized continuum where reactive obsessions fall in between autogenous obsessions and worry with respect to several thought characteristics concerning content appraisal, perceived form, and thought triggers. Nonclinical undergraduate students ($n = 435$) were administered an online packet of questionnaires designed to examine the three different types of thoughts. Main data analyses included only those displaying moderate levels of obsessions or worries ($n = 252$). According to the most distressing thought, three different groups were formed and compared: autogenous obsession ($n = 34$), reactive obsession ($n = 76$), and worry ($n = 142$). Results revealed that (a) relative to worry, autogenous obsessions were perceived as more bizarre, more unacceptable, more unrealistic, and less likely to occur; (b) autogenous obsessions were more likely to take the form of impulses, urges, or images, whereas worry was more likely to take the form of doubts, apprehensions, or thoughts; and (c) worry was more characterized by awareness and identifiability of thought triggers, with reactive obsessions through these comparisons falling in between. Moreover, reactive obsessions, relative to autogenous obsessions,

*Corresponding author. Tel.: +1-512-404-9308; fax: +1-512-471-6175.
E-mail address: telch@austin.utexas.edu (M.J. Telch).

0005-7967/$ - see front matter © 2004 Published by Elsevier Ltd.
doi:10.1016/j.brat.2004.06.017

were more strongly associated with both severity of worry and use of worrying as a thought control strategy. Our data suggest that the reactive subtype represents more worry-like obsessions compared to the autogenous subtype.
© 2004 Published by Elsevier Ltd.

Keywords: Autogenous obsessions; Reactive obsessions; Worry; Continuum hypothesis; Obsessive–compulsive disorder

1. Introduction

Obsessions and excessive worry are defining features of both obsessive–compulsive disorder (OCD) and generalized anxiety disorder (GAD). Obsessions are recurrent thoughts, images, and impulses, which are experienced as intrusive and inappropriate, cause marked anxiety and distress, and are not simply excessive worries about real-life problems (APA, 1994). Worry is defined as a chain of thoughts and images, negatively affect-laden and relatively uncontrollable (Borkovec, Robinson, Pruzinsky, & DePree, 1983). Several authors have documented differences between obsessions and worry. Compared to obsessions, worry is more ego-syntonic and less intrusive, being evoked by more identifiable triggers (Turner, Beidel, & Stanley, 1992). Worry was found to be rated as more verbally oriented, more realistic, less involuntary, longer in duration, more distracting, less dismissible and more often associated with a greater compulsion, compared to obsessions (Wells & Morrison, 1994). It has also been suggested that obsessional intrusions and worry can be distinguished by several variables including frequency, duration, percentage of verbal and image content, interference, ego-dystonic nature, and stimuli awareness (Langlois, Freeston, & Landoucer, 2000a, b). However, obsessions and worry are not without similarities. Both are commonly experienced in the general population, have identical thought contents and forms between normal and clinical populations, demonstrate greater frequency and uncontrollability in clinical populations relative to normal populations, and are associated with adverse mood (Turner et al., 1992).

Recently, an obsession model has been proposed which classifies obsessions into two subtypes: autogenous obsessions and reactive obsessions (Lee & Kwon, 2003; Lee, Kwon, Kwon, & Telch, 2004). Autogenous obsessions are highly aversive and unrealistic thoughts, images, or impulses that tend to be perceived as threatening in their own right. Autogenous obsessions include sexual, aggressive, blasphemous or repulsive thoughts, images, or impulses. They tend to be perceived as very ego-dystonic and unacceptable, and evoke efforts to remove or control the thought(s) themselves. Moreover, they are likely to be elicited without clear triggers or by some triggers symbolically or remotely associated with the thoughts (e.g., the letter S triggering the thought of killing one's sister). In contrast, reactive obsessions are relatively realistic aversive thoughts, doubts, or concerns where the perceived threat tends to be not the obsession itself but rather its possible negative consequence(s). Reactive obsessions include thoughts, concerns, or doubts about contamination, mistakes, accidents, asymmetry or disarray. They tend to be perceived as relatively realistic and likely to come true, and elicit overt actions aimed at putting the associated uncomfortable situation back to a safe or desired state. Moreover, they are likely to be triggered primarily by external cues, which correspond to specific core threats (e.g., exposure to dirt activating the threat of contamination, which is neutralized through washing rituals). Lee and

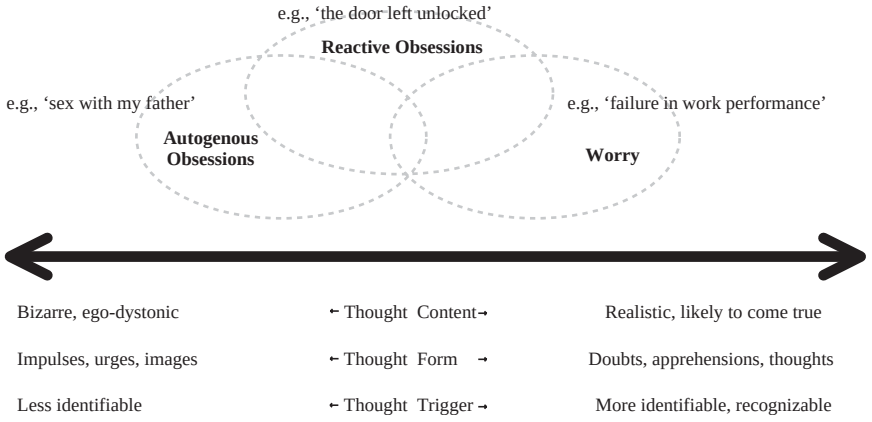

Fig. 1. The continuum hypothesis of obsessions and worry.

colleagues have reported that the two subtypes of obsessions elicited different emotional reactions, cognitive appraisals, and control strategies in both nonclinical student and OCD patient samples (Lee & Kwon, 2003, Lee et al., 2004).

The aim of the present study was to test the hypothesis that autogenous obsessions, reactive obsessions, and worry would form a continuum on several thought characteristics (see Fig. 1). More specifically, the three types of thoughts would differ as to *thought content appraisal*, *thought form perception*, and *thought trigger perception*: (a) autogenous obsessions would be appraised as more ego-dystonic, more unacceptable, more bizarre, less realistic and less likely to come true compared to worry, with reactive obsessions falling in between; (b) autogenous obsession would take the form of more impulses, urges and visual images, whereas worry would take the form of more doubts, apprehensions, and verbal thoughts, with reactive obsession falling in between; and (c) relative to autogenous obsessions, worry would be more likely characterized by an awareness of identifiable thought triggers, with reactive obsessions falling in between. Finally, we hypothesized that reactive obsessions would be more strongly associated with severity of worry and use of worrying as a thought control strategy, compared to autogenous obsessions.

2. Method

2.1. Participants

Four hundred and thirty-five undergraduate students (317 women and 118 men) enrolled in introductory psychology classes at the University of Texas at Austin participated in the present study. Participants ranged in age from 17 to 35 ($M = 18.65$, $SD = 1.30$) and were ethnically diverse. The final sample consisted of Caucasian (59.5%), Asian/Pacific Islander (16.6%), Hispanic (14.7%), African American (3.4%), and other (5.8%). Participants received partial course credit for their participation.

2.2. Measures

2.2.1. Revised obsessional intrusion inventory (ROII; Purdon & Clark, 1993)

The ROII was developed to assess intrusive thoughts, images, and impulses (Purdon & Clark, 1993). Part I of the ROII asks respondents to rate how frequently they experience each of 52 obsessional thoughts, images, and impulses on a 7-point scale (0 = never; 1 = once or twice; 2 = a few times a year; 3 = once or twice a month; 4 = once or twice a week; 5 = daily; 6 = frequently during the day), and Part II evaluates in detail the most distressing thought selected from Part I. Adequate reliability and validity of this measure have been demonstrated (Purdon & Clark, 1993, 1994a, b). The present study used only Part I. Lee and Kwon (2003) have conducted exploratory and confirmatory factor analyses demonstrating that these 52 obsessional thoughts constitute two distinct factors (i.e., autogenous vs. reactive obsessions) corresponding to the autogenous–reactive model. The autogenous-obsession factor includes 41 thoughts, images, and impulses concerning sex, violence, aggression, and blasphemies (e.g., Thoughts of engaging in sexual activity that goes against my sexual preference), while the reactive-obsession factor includes 11 thoughts, concerns, and doubts concerning mistakes, accidents, dirt, or contamination (e.g., Thoughts of leaving the heat, stove or lights on in the house which may cause a fire). For data analyses, subscale frequency scores were computed separately for autogenous and reactive obsessions by summing up the frequencies of the 41 autogenous and 11 reactive obsession items (see Lee and Kwon, 2003).

2.2.2. Worry domain questionnaire—short form (WDQ-SF; Stöber & Joormann, 2001)

The WDQ is a self-report questionnaire widely used to assess levels of worry across five domains of everyday concern: relationships, lack of confidence, aimless future, work, and financial issues. Stöber and Joormann (2001) developed a short form of the WDQ, which has demonstrated excellent internal consistency (Cronbach's $\alpha = 0.88$), a clear five-factor structure, and a near-perfect correlation with the original WDQ ($r = 0.97$). We used the WDQ-SF in order to identify participants' most distressing worry, as well as to assess severity of worry.

2.2.3. Thought examination scale (TES)

The TES is a 14-item self-report measure constructed by the authors for evaluating various thought characteristics of obsessions and worry. The following instruction is presented, "*This questionnaire is aimed at examining various characteristics of your most distressing thought. Thinking only about this thought, please indicate to what extent you agree with each statement*", and each item is rated based on a 5-point scale (0 = not at all to 4 = absolutely). Three domains covered by the TES and their respective items are as follows: (a) Thought content appraisal (i.e., *The content of this thought is bizarre*; *This thought reflects worry about real-life problems; The content of this thought is very unacceptable; The content of this thought is realistic; This thought is likely to come true*); (b) Thought form perception (i.e., *This thought takes the form of impulse or urge; This thought takes the form of visual image; This thought takes the form of verbal thought; This thought takes the form of doubt or apprehension*); (c) Thought trigger perception (*When this thought occurs, I can recognize some specific triggers that evoked it; This thought pops into my mind without any triggers; This thought is evoked by apprehension about some future event; I clearly know what evokes this thought*). In addition to these three domains, one item measures the duration of thought (i.e.,

Once this thought occurs, it stays in my head for __ h and __ min). Internal consistency (Cronbach's α) of the TES was 0.79 in the present sample.

2.2.4. Penn state worry questionnaire (PSWQ; Meyer, Miller, Metzger, & Borkovec, 1990)

The PSWQ is a 16-item questionnaire designed to assess excessive and uncontrollable worry (Meyer et al., 1990; Molina & Borkovec, 1994). Participants respond to items using a 5-point scale (1 = 'not at all typical of me' to 5 = 'very typical of me'). The items focus on the excessiveness, duration and uncontrollability of worry and related distress. The PSWQ has demonstrated excellent reliability and validity (Stöber, 1998; Brown, Marten, & Barlow, 1995; Molina & Borkovec, 1994).

2.2.5. Obsessive–compulsive inventory—revised (OCI-R; Foa et al., 2002)

The OCI-R is an 18-item self-report measure of OC symptoms designed for use with both clinical and nonclinical samples. The OCI-R consists of 18 items forming 6 subscales (i.e., checking, hoarding, neutralizing, obsessing, ordering, and washing) and has demonstrated excellent psychometric properties. The OCI-R and its subscales successfully discriminate individuals with and without OCD (Foa et al., 2002).

2.2.6. State–trait anxiety inventory—trait version (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983)

The STAI is a 40-item self-report measure of state and trait anxiety. This study employed only the trait version, which consists of 20 items assessing trait anxiety or how the respondent feels generally. The STAI has demonstrated sound reliability and validity (Spielberger et al., 1983).

2.2.7. Beck depression inventory-II (BDI-II; Beck, Steer, & Brown, 1996)

The BDI is a 21-item self-report measure widely used to assess depressive symptoms. The reliability and stability of the BDI have been comprehensively validated and reviewed (Beck & Steer, 1984; Beck, Steer, & Garbin, 1988; Beck et al., 1996), and its psychometric properties have been established cross-culturally (Kammer, 1983). BDI-II is the latest version of the measure designed to make its symptom content consonant with the diagnostic criteria for major depressive disorders (MDD) in the DSM-IV.

2.2.8. Thought control questionnaire (TCQ; Wells & Davies, 1994)

The TCQ is a 30-item self-report questionnaire designed to measure strategies used to control unpleasant or unwanted thoughts. Each item is endorsed on a 4-point scale (1 = never to 4 = almost always). The TCQ taps five subscales: distraction (e.g., I think pleasant thoughts instead), social coping (e.g., I find out how my friends deal with these thoughts), worrying (e.g., I worry about more minor things instead), punishment (e.g., I punish myself for thinking the thought), and reappraisal (e.g., I try a different way of thinking about it). Each strategy comprises six items and, thus, total scores for each strategy range from 6 to 24 with higher scores indicating a stronger tendency to employ the pertaining strategy in case of unwanted intrusions. We used the TCQ to evaluate participants' general tendency to use various strategies in order to suppress unpleasant thoughts.

2.3. Procedure

A screening battery consisting of the ROII and the WDQ was administered to a large number of undergraduate students ($n = 1977$). Of the respondents, those ($n = 1105$) who reported total scores higher than the group mean either on the ROII (mean = 29.47, SD = 25.07) or the WDQ (mean = 13.02, SD = 8.26) were invited to participate in the present study. Of these, 435 students agreed to participate and provided written consent. The computerized online questionnaire battery was then completed individually on the web. In the battery, they selected their most distressing thought from either the ROII or the WDQ, which was further evaluated by the TES. In order to avoid contamination, participants were not provided any description discriminating the different types of mental intrusion.

2.4. Statistical analyses

Zero-order and partial correlational analyses were conducted on the questionnaire data to test the associations between autogenous/reactive obsessions, worry, anxiety and depression. Differences between autogenous obsessions, reactive obsessions and worry were examined using separate MANOVAs for each of the three thought characteristic dimensions as measured by the TES. A final MANOVA was performed to examine differences between the three thought categories on thought control strategies as measured by the TCQ. Follow-up univariate tests and post hoc multiple comparisons using LSD were conducted to test specific study hypotheses.

3. Results

The zero-order and partial correlations among the study measures are presented in Table 1. As seen in Table 1, the pattern of inter-correlations differed markedly between autogenous and reactive obsessions. Compared to autogenous obsessions, reactive obsessions were more highly associated with OC symptoms and worry. Moreover, of the two obsessional subtypes, only reactive obsessions were still significantly associated with each of the two indices of worry after controlling for depression and trait anxiety.

Three domains of the TES were compared among the three subgroups of participants who selected either an autogenous obsession, reactive obsession, or worry as their most distressing thought. These analyses were confined to those whose most distressing obsession or worry was experienced 'once or twice a week' to 'frequently during the day' in the ROII scale, or 'quite a bit' to 'extremely' in the WDQ scale.[1] Using these criteria, three subgroups were formed: (a) those displaying autogenous obsessions (AO; $n = 34$), (b) those displaying reactive obsessions (RO; $n = 76$), and (c) those displaying worry (WO; $n = 142$), as their most distressing thought. Comparisons of the three groups on demographic characteristics, as well as levels of depression and trait anxiety, revealed no significant differences. However, AO scored higher on the ROII autogenous subscale, RO scored higher on the ROII reactive subscale, and WO scored higher on

[1]The rationale for these selection criteria was to maximize clinical relevance. Thoughts that occur with negligible frequency or severity were deemed of low clinical relevance and were not included in the main analyses.

Table 1
Zero-order correlations between study measures and partial correlations after controlling for depression and trait anxiety ($n = 435$)

	ROII-A	ROII-R	WDQ	PSWQ	OCI	BDI
ROII-R	0.18***					
	(0.14**)[a]					
WDQ	0.14**	0.27***				
	(0.01)	(0.10*)				
PSWQ	0.01	0.40***	0.58***			
	(−0.13*)	(0.29***)	(0.26***)			
OCI	0.20***	0.61***	0.44***	0.50***		
	(0.12*)	(0.55***)	(0.15**)	(0.27***)		
BDI	0.24***	0.27***	0.61***	0.50***	0.45***	
STAI-T	0.15**	0.30***	0.65***	0.66***	0.48***	0.75**

*$p<0.05$; **$p<0.01$; ***$p<0.001$.
ROII-A = autogenous obsession subscale score; ROII-R = reactive obsession subscale score; WDQ = worry domain questionnaire; BDI = Beck depression inventory; STAIT = state–trait anxiety inventory—trait version; PSWQ = Penn state worry questionnaire; OCI = obsessive–compulsive inventory.
[a]Partial correlations after controlling for depression and anxiety are presented in parentheses.

Table 2
Comparisons on demographics and self-reported depression and anxiety between the three groups

	AO ($n = 34$)		RO ($n = 76$)		WO ($n = 142$)		F or χ^2	LSD Post hoc
	Mean	SD	Mean	SD	Mean	SD		
Age	18.29	0.68	18.42	0.68	18.77	1.72	2.64	
Gender (% male)	24%		14%		27%		4.72	
BDI	14.68	9.73	14.89	10.96	13.60	9.27	0.49	
STAI-T	49.26	13.75	50.78	13.90	49.32	11.24	0.37	
ROII-A	52.26	29.37	21.95	22.15	21.53	18.32	30.44**	AO > RO, WO
ROII-R	9.06	7.66	21.36	9.33	9.44	7.69	56.60**	RO > AO, WO
WDQ	19.18	8.60	19.92	8.41	22.54	7.00	4.37*	WO > AO, RO

*$p<0.05$; **$p<0.01$.
AO = autogenous obsession group; RO = reactive obsession group; WO = worry group.
BDI = Beck depression inventory; STAI-T = state–trait anxiety inventory—trait version; ROII-A = autogenous obsession subscale score; ROII-R = reactive obsession subscale score; WDQ = worry domain questionnaire.

the WDQ, than the other two groups (see Table 2). These data confirm the validity of our subgroup assignment.

3.1. TES thought content appraisals

Results revealed a significant main effect for group (Wilks' Lambda $F = 14.42$, $p<0.001$, Partial Eta Squared $\eta_p^2 = 0.23$), indicating the three groups differed on these items. Significant

group differences were observed for each of the following: 'The content of this thought is bizarre' [$F(2,249) = 22.31$, $p < 0.001$, $\eta_p^2 = 0.15$], 'This thought reflects worry about real-life problems' [$F(2,249) = 43.35$, $p < 0.001$, $\eta_p^2 = 0.26$], 'The content of this thought is very unacceptable' [$F(2,249) = 14.11$, $p < 0.001$, $\eta_p^2 = 0.10$], 'The content of this thought is realistic' [$F(2,249) = 6.22$, $p < 0.01$, $\eta_p^2 = 0.05$], and 'This thought is likely to come true' [$F(2,249) = 3.64$, $p < 0.05$, $\eta_p^2 = 0.03$]. Results of post hoc tests revealed that, compared to worries, autogenous obsessions were more bizarre, less about real-life problems, more unacceptable, less realistic, less likely to come true, with reactive obsessions falling in between. An exception was that perceived unacceptability was significantly greater in worries relative to reactive obsessions (see Table 3).

3.2. TES thought form perception

A significant main effect for group was observed (Wilks' Lambda $F = 19.45$, $p < 0.001$, $\eta_p^2 = 0.24$). Significant group differences were observed for each of the following: 'This thought takes the form of impulse or urge' [$F(2,249) = 8.78$, $p < 0.001$, $\eta_p^2 = 0.07$], 'This thought takes the form of doubt or apprehension' [$F(2,249) = 43.77$, $p < 0.001$, $\eta_p^2 = 0.26$], 'This thought takes the form of visual image' [$F(2,249) = 12.51$, $p < 0.001$, $\eta_p^2 = 0.09$], and 'This thought takes the form of verbal thought.' [$F(2,249) = 12.58$, $p < 0.001$, $\eta_p^2 = 0.09$]. Post hoc comparisons revealed that autogenous obsessions were rated higher on taking the form of impulses or urges, and less doubt

Table 3
Means, standard deviations and *F*-statistics for the content appraisal, thought form perception, thought trigger perception and thought duration of the TES

	AO ($n = 34$)		RO ($n = 76$)		WO ($n = 142$)		*F*	LSD Post hoc
	Mean	SD	Mean	SD	Mean	SD		
Bizarre	1.71	1.24	1.28	1.00	0.62	0.90	22.31***	AO > RO > WO
Real-life problem	1.15	1.18	2.20	1.25	3.06	1.06	43.35***	AO < RO < WO
Unacceptable	2.24	1.30	0.89	1.08	1.25	1.28	14.11***	AO > WO > RO
Realistic	2.09	1.38	2.75	1.11	2.83	1.04	6.22**	AO < RO, WO
Likely to come true	1.47	1.24	1.93	1.18	2.07	1.14	3.64*	AO, RO < WO
Impulse or urge	2.15	1.35	1.49	1.41	1.15	1.16	8.78***	AO > RO, WO
Doubt apprehension	1.15	1.08	2.17	1.24	3.03	1.06	43.77***	AO < RO < WO
Visual image	2.56	1.33	1.76	1.36	1.33	1.29	12.51***	AO > RO > WO
Verbal thought	1.15	1.31	1.34	1.26	2.10	1.31	12.58***	AO, RO < WO
Recognize triggers	1.62	1.21	1.89	1.28	2.22	1.20	4.04*	AO, RO < WO
Pops up without triggers	1.71	1.34	1.53	1.24	1.68	1.20	0.43	
Evoked by Apprehension	1.06	1.10	1.38	1.25	2.82	1.12	55.18***	AO, RO < WO
Clearly know the trigger	1.35	1.41	2.00	1.39	1.87	1.30	2.81	AO < RO, WO
Duration (min)	31.16	43.80	52.90	82.29	168.73	137.63	4.60*	AO, RO < WO

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$.
AO = autogenous obsession group; RO = reactive obsession group; WO = worry group.

or apprehension, compared to worries, with reactive obsessions falling in between. Moreover, compared to worries, autogenous obsessions were rated higher on taking the form of visual images, with reactive obsessions falling in between. In contrast, compared to both autogenous and reactive obsessions, worries were rated higher on taking the form of verbal thought (see Table 3).

3.3. TES thought trigger perception

A significant main effect for group was observed (Wilks' Lambda $F = 14.35$, $p < 0.001$, $\eta_p^2 = 0.19$). Significant group differences were observed for each of the following: 'When this thought occurs, I can recognize some specific triggers that evoked it' [$F(2, 249) = 4.04$, $p < 0.05$, $\eta_p^2 = 0.03$], and 'This thought is evoked by apprehension about some future event' [$F(2, 249) = 55.18$, $p < 0.001$, $\eta_p^2 = 0.31$]. A marginal group difference was also observed on 'I clearly know what evokes this thought' [$F(2, 249) = 2.81$, $p = 0.06$, $\eta_p^2 = 0.02$]. Post hoc tests revealed that thought triggers were more identifiable for worries than for either autogenous obsessions or reactive obsessions. Moreover, relative to the AO group, the WO and RO groups reported greater awareness of triggers for their most distressing thought. In sum, worries were more characterized by awareness of identifiable triggers, relative to autogenous obsessions, and reactive obsessions fell roughly in between (see Table 3).

3.4. TES thought persistency

The duration of the most distressing thought measured in hours and minutes was compared among the three groups. A univariate ANOVA revealed a significant group difference [$F(2, 249) = 4.60$, $p < 0.05$, $\eta_p^2 = 0.04$], and post hoc tests showed that worries were more persistent than autogenous obsessions or reactive obsessions (see Table 3).

3.5. Thought control strategies

A significant main effect for group was observed (Wilks' Lambda $F = 1.89$, $p < 0.05$, $\eta_p^2 = 0.04$). Various thought control strategies, as measured by the TCQ, were compared among the three groups. A series of univariate ANOVAs on the TCQ subscales revealed a significant group difference on the Worrying subscale [$F(2, 249) = 5.40$, $p < 0.01$, $\eta_p^2 = 0.04$]. Follow-up multiple comparisons revealed that the AO group was significantly less likely to report using worrying as a thought control strategy relative to the RO or WO groups (see Table 4).

4. Discussion

This study sought to examine a hypothesized continuum formed by autogenous obsessions, reactive obsessions and worry using a nonclinical student population. Overall, our data are quite consistent with the hypothesis that the reactive subtype reflects more worry-like obsessions than the autogenous subtype. Compared to autogenous obsessions, reactive obsessions were more strongly associated with severity of worry as measured by the two different worry questionnaires. Even after controlling the effects of depression and trait anxiety, reactive obsessions showed

Table 4
Means, standard deviations, and *F*-statistics for the TCQ subscales among the three groups

	AO ($n = 34$)		RO ($n = 76$)		WO ($n = 142$)		*F*	LSD Post hoc
	Mean	SD	Mean	SD	Mean	SD		
Distraction	8.53	3.93	9.05	3.89	8.44	3.18	0.76	
Social	6.65	2.97	7.03	2.63	7.20	2.54	0.63	
Punishment	3.47	2.56	4.61	3.74	3.73	2.76	2.51	
Worry	2.50	2.15	4.72	3.98	4.28	3.18	5.40**	AO < RO, WO
Reappraisal	6.35	3.20	7.61	4.01	7.22	3.68	1.33	

** $p < 0.01$.
AO = autogenous obsession group; RO = reactive obsession group; WO = worry group.

significant associations with the WDQ and PSWQ scores, whereas autogenous obsessions showed nearly zero or negative associations. Furthermore, comparisons with respect to several thought characteristics as measured by the TES revealed that reactive obsessions, relative to autogenous obsessions, were closer to worry. Autogenous obsessions were perceived as more bizarre, more unrealistic, more unacceptable, and less likely to come true than worry. Autogenous obsessions took the form of more impulses, urges, and images, whereas worry took the form of more doubts, apprehensions, and thoughts. Worry was also more characterized by awareness of identifiable thought triggers, relative to autogenous obsessions. For these comparisons (with the one exception of the unacceptability of thought content), reactive obsessions tended to fall in between autogenous obsessions and worry. Finally, those who reported reactive obsessions or worry as their most distressing thought, reported greater use of worrying as a thought control strategy relative to those who reported autogenous obsessions. Taken together, our findings suggest that these three types of mental intrusions (worry, reactive obsessions, and autogenous obsessions) fall on a continuum with respect to the aforementioned thought characteristic dimensions.

Our data are also in line with previous findings that have highlighted the differences between obsessions and worries (Langlois et al., 2000a, b; Wells & Morrison, 1994; Turner et al., 1992), replicating some of the major findings that worry was perceived as more realistic, less ego-dystonic, more persistent, and more verbally oriented compared to obsessions. However, our findings suggest that the differences between worries and autogenous obsessions are more striking than the differences between worries and reactive obsessions. It may be that obsessions are too heterogeneous to be simply compared with worry without taking into account the considerable thematic variations.

It has been noted that research concerning intrusive thoughts has assumed non-specificity with regard to their thematic contents in examining appraisal and control strategies manifested across diverse types of intrusive thoughts (Clark, Purdon, & Byers, 2000). The present findings provide some evidence suggesting that appraisal and thought control strategies differ as a function of the type of mental intrusion. Our data demonstrated that those displaying autogenous obsessions, reactive obsessions, or worries as their primary mental intrusion differed with regard to various thought content appraisals. Moreover, those displaying autogenous obsessions were less likely to use worrying as a thought control strategy relative to those displaying reactive obsessions or

worries. Langlois and colleagues (2000b) have also suggested that the choice of coping strategies is a function of dimensions of appraisal such as the degree to which the thought is perceived as ego-dystonic or the extent to which the thought's content seems to have some basis in reality. Further investigations of differences in appraisal and thought control strategies as a function of the content of the intrusion appear warranted.

Our findings may have some implications for treatment development with OCD patients. First, because our findings suggest that individuals whose obsessions are primarily autogenous in nature do not display clear awareness of thought triggers, they may show less benefit from traditional exposure and response prevention due to the absence of clear targets for exposure. Second, the similarity observed between reactive obsessions and worries suggest the possibility of applying strategies used in the treatment of pathological worry (e.g., worry exposure) to OCD individuals whose primary obsessions are reactive in nature.

Some limitations of the present study should also be noted. First, our data should be interpreted with caution given the nonclinical sample. Replication with obsessions and worries reported from clinical samples of OCD and GAD patients is clearly needed. Second, all data were obtained via questionnaires. Some thought characteristics such as trigger perception may be too subtle to be captured by retrospective self-report. This may explain why we observed relatively small effect sizes in the group comparisons on thought trigger perception of the TES. The TES has also not been sufficiently validated, since it was constructed for the purpose of testing specific study hypotheses. Replication based on data derived from structured clinical interviews and experimental studies is needed. Furthermore, the continuum formulation presented here does not necessarily assume that the three domains as measured by the TES (i.e., thought content, thought form, and thought triggering) are unidimensional. Future work is necessary to determine whether this continuum is best conceptualized as one-dimensional or multi-axial in nature.

References

American Psychiatric Association (1994). *Diagnostic and statistical manual of mental disorders* (4th ed). Washington: American Psychiatric Association.

Beck, A. T., & Steer, R. A. (1984). Internal consistencies of the original and revised Beck Depression Inventory. *Journal of Clinical Psychology*, *40*, 1365–1367.

Beck, A. T., Steer, R. A., & Brown, G. K. (1996). *BDI-II, Beck Depression Inventory: manual*. Psychological Corporation: Harcourt Brace.

Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: twenty-five years of evaluation. *Clinical Psychology Review*, *8*, 77–100.

Borkovec, T. D., Robinson, E., Pruzinsky, T., & Depree, S. A. (1983). Preliminary exploration of worry: some characteristics and processes. *Behaviour Research and Therapy*, *21*, 9–16.

Brown, T. A., Marten, P. A., & Barlow, D. H. (1995). Discriminant validity of the symptoms comprising the DSM-III-R and DSM-IV associated symptom criterion of Generalized Anxiety Disorder. *Journal of Anxiety Disorders*, *9*, 317–328.

Clark, D. A., Purdon, C., & Byers, E. S. (2000). Appraisal and control of sexual and non-sexual intrusive thoughts in university students. *Behaviour Research and Therapy*, *38*, 439–455.

Foa, E. B., Huppert, J. D., Leiberg, S., Langner, R., Kichic, R., Hajcak, G., & Salkovskis, P. M. (2002). The Obsessive–Compulsive Inventory: development and validation of a short version. *Psychological Assessment*, *14*, 485–496.

Kammer, D. (1983). Eine untersuchung der psychometrischen eigenschoften des deutschen. *Diagnostica*, *29*, 48–60.

Langlois, F., Freeston, M. H., & Landoucer, R. (2000a). Differences and similarities between obsessive intrusive thoughts and worry in nonclinical population: study 1. *Behaviour Research and Therapy*, *38*, 157–173.

Langlois, F., Freeston, M. H., & Landoucer, R. (2000b). Differences and similarities between obsessive intrusive thoughts and worry in nonclinical population: study 2. *Behaviour Research and Therapy*, *38*, 175–189.

Lee, H. -J., & Kwon, S. -M. (2003). Two different types of obsessions: autogenous obsessions and reactive obsessions. *Behaviour Research and Therapy*, *41*, 11–29.

Lee, H.-J., Kwon, S.-M., Kwon, J. S., & Telch, M. J. (2004). Testing the autogenous–reactive model of obsessions, submitted for publication.

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

Molina, S., & Borkovec, T. D. (1994). The Penn state worry questionnaire: psychometric properties and associated characteristics. In G. C. L. Davey, & F. Tallis (Eds.), *Worrying: perspectives on theory, assessment and treatment* (pp. 265–283). New York, NY: Wiley.

Purdon, C., & Clark, D. A. (1993). Obsessive intrusive thoughts in nonclinical subjects-Part I. Content and relation with depressive, anxious and obsessional symptoms. *Behaviour Research and Therapy*, *31*, 713–720.

Purdon, C., & Clark, D. A. (1994a). Obsessive intrusive thoughts in nonclinical subjects-Part II. Cognitive appraisal, emotional response and thought control strategies. *Behaviour Research and Therapy*, *32*, 403–410.

Purdon, C., & Clark, D. A. (1994b). Perceived control and appraisal of obsessional intrusive thoughts: a replication and extension. *Cognitive-Behavioural Psychotherapy*, *22*, 269–285.

Spielberger, C. D., Gorsuch, R. L., Lushene, R., Vagg, P. R., & Jacobs, G. A. (1983). *Manual for the state-trait anxiety inventory*. Palo Aloto, CA: Consulting Psychologist Psychologist Press.

Stöber, J. (1998). Reliability and validity of two widely used worry questionnaires: self-report and self-peer convergence. *Personality and Individual Differences*, *24*, 887–890.

Stöber, J., & Joormann, J. (2001). A short form of the worry domain questionnaire: construction and factorial validation. *Personality and Individual Differences*, *31*, 591–598.

Turner, S. M., Beidel, D. C., & Stanley, M. A. (1992). Are obsessional thoughts and worry different cognitive phenomenon? *Clinical Psychology Review*, *12*, 257–270.

Wells, A., & Davies, M. (1994). The thought control questionnaire: a measure of individual differences in the control of unwanted thoughts. *Behaviour Research and Therapy*, *32*, 871–878.

Wells, A., & Morrison, A. P. (1994). Qualitative dimensions of normal worries and normal obsessions: a comparative study. *Behaviour Research and Therapy*, *32*, 867–870.