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Universitat Autònoma de Barcelona

Departamento de Psicología Clínica y de la Salud
Facultad de Psicología

TESIS DOCTORAL

OCD in adolescents: the prevalence and contribution of cognitive beliefs in OCD and other emotional disorders

Presented by Zahra Noorian

Director: Dra. Edelmira Domènech-Llaberia

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GENERAL OVERVIEW

In this doctoral thesis, divided into three studies, I have three general objectives: (1) the epidemiological study of obsessive compulsive disorder (OCD) symptoms among Spanish adolescents; (2) studying the contribution of dysfunctional obsessive beliefs in OCD symptoms; (3) studying the specificity of obsessive beliefs to OCD and other psychological disorder like GAD, social phobia and depression.

The first study examines the prevalence of OCD symptoms in a population of 1061 adolescents with the mean age of 13.92. It also investigates the association between anxiety symptoms severity (panic attacks, separation anxiety, social phobia, generalized anxiety and school phobia) and depressive symptom severity.

OCD symptoms are assessed by Leyton Obsession Inventory (LOI-CV) questionnaire. Two distinct groups of subjects are defined as being 'positive' on the LOI-CV according to Flamment et al. (1988). The first group (called *High interference*) includes all of the subjects who scored 25 or more in interference regardless of symptom presence score. The second group (labeled *High symptom presence)* consists of all subjects with a symptom presence score equal to or above 15 and an interference score of 10 or less. Associated depression and anxiety symptoms severities were measured by the Screen for Child Anxiety Related Emotional Disorders (SCARED) and Children's Depression Inventory (CDI).

The results of the first study shows that forty- one subjects (3.9%) showed an interference score of 25 or more (high interference group) while eight students (0.8%) were included in the high symptom presence group. The most prevalent and interfering symptoms were fussy about hands, hating dirt and contamination and going over things a lot. In addition, the association between

LOI and depressive symptom severity was significant, while the association between LOI and anxiety symptoms severity was insignificant.

Cognitive theories of OCD suggest that interpretation of intrusive thoughts, including meaning and appraisals that are given to the obsessions play a crucial role in the development of OCD. The objective of the second study is to investigate the association of dysfunctional obsessive beliefs such as inflated responsibility and overestimation of threat (RT), perfectionism and intolerance of uncertainty (PC), importance and need to control thoughts (ICT) and thought action fusion (TAF) to OCD symptoms in a population of adolescents. Although there are several studies that assess the role of obsessive beliefs in the development of OCD symptoms, little is known about the contribution of these beliefs among adolescents. In the second study, 966 adolescents with a mean age of 13.89 years completed questionnaires measuring obsessive beliefs, thought-action fusion (TAF), obsessive compulsive, depression, and anxiety symptoms.

Findings from various statistical analyses in the second study indicate that all OCD symptom dimensions assessed by LOI-CV were significantly associated with all of the obsessive beliefs measured by OBQ-44. Using partial correlation and controlling for depression symptoms did not change the significance of the relation; yet the magnitude of the correlations changed. Linear regression analysis shows that perfectionism and intolerance of uncertainty that accompanies depression and anxiety symptoms predict all OCD symptoms dimensions. Moreover, TAF-likelihood belief predicts mental compulsion and superstition symptom. OCD is a chronic and disabling disorder among children and adolescents. Paying more attention to cognitive etiology of this disorder would facilitate the therapy process. Therefore, addressing true dysfunctional obsessive beliefs in sufferers can enhance our knowledge about applying appropriate therapies.

In the third study, I studied whether dysfunctional obsessive beliefs such as responsibility and threat estimation (RT), perfectionism and intolerance of uncertainty beliefs (PC),importance and control of thought (ICT) and thought action fusion belief (TAF) are exclusive to OCD or they can also exist in other psychological disorders such as social phobia (FS), generalized anxiety disorder (GAD) and major depression and or distimia (MDD/distimia). Moreover, the relation between obsessive beliefs and clinical variables like OCD, depression and anxiety symptoms has been assessed in different diagnostic groups.

The sample consists of adolescents with 4 different diagnosis, 16 adolescents with OCD, 64 adolescents with FS, 52 adolescents with GAD and47 adolescents with MDD/distimia.

The analysis of variance (ANOVA) shows that there is no significant difference between different diagnostic group on obsessive beliefs measured by Obsessive Belief Questionnaire (OBQ-44)and TAF-A. Correlational analysis reveals that all obsessive beliefs measured by OBQ and TAF are significantly correlating with depression (CDI-total), anxiety (SCARED-total) and OCD symptoms (LOI-total) in all of participants.

1. INTRODUCTION
1.1. Definition of OCD and its clinical features

Obsessive-compulsive disorder (OCD) is defined based on two main concepts: obsessions and compulsions (American Psychiatric Association, 2000). Obsessions are upsetting thoughts, images or impulses that interrupting to person's consciousness. Compulsions are repetitive behaviors or mental acts that the person feels compelled to perform, usually with the desire to resist. Compulsions are usually performed in an excessive intention to prevent a feared event and reducing distress (American Psychiatric Association, 2000).

OCD is described as a heterogeneous disorder with a few consistent, temporally stable symptom dimensions (Bloch, Landeros-Weisenberger, Rosario, Pittenger, & Leckman, 2008). However, there is a tendency overtime toward a change in obsessive content and in illness severity (Swedo, Rapoport, Leonard, Lenane, & Cheslow, 1989). Factor analysis study of OCD suggests that obsessive-compulsive symptoms can be grouped into a small number of dimensions (Mataix-Cols, do Rosario-Campos, & Leckman, 2005): (a) contamination obsessions and washing/cleaning compulsions; (b) obsessions about responsibility for causing harm and checking compulsions; (c) obsessions about order and symmetry and ordering/arranging compulsions; (d) "repugnant" obsessions concerning sex, religion and violence along with mental compulsive rituals as well as other covert neutralizing strategies.

OCD is described as a severe and disabling psychiatric condition among children and adolescents. In the past few decades, clinical and psychobiological knowledge of OCD for young population has been advanced substantially (Canals, Hernández Martínez , Cosi, & Voltas, 2012). For a long time, OCD was thought to be rare in children and adolescents; yet now we know that OCD often starts in childhood and adolescence and can develop into a chronic

disorder with high rates of persistence (Micali et al., 2010). According to the US National Comorbidity Survey Replication (NCS-R), about 20% of all affected persons in the USA suffer from manifestations of the disorder at age 10 or even earlier (Kessler, Berglund, et al., 2005; Kessler, Chiu, Demler, & Walters, 2005).

The most common obsessions in children are unreasonable fears of germs and contamination, aggression (harm or death to themselves or others), symmetry and exactness (just right), excessive sense of right and wrong, and the unrealistic and bizarre thoughts such as fear of AIDS contamination(Fisman & Walsh, 1994) . In adolescence, religious and sexual obsessions are also common (Franklin et al., 1998; Geller et al., 2001). The most frequent compulsive behaviors in young people (in decreasing order of frequency) include washing, repetition, checking, counting, ordering, touching and hoarding (Flament et al., 1988; Franklin et al., 1998; Riddle et al., 1990; Toro, Cervera, Osejo, & Salamero, 1992; Wever & Rey, 1997).

The majority of young people typically have obsessions and compulsions symptoms and the insight to the excessive and unreasonable nature of their worries is usually absent (Catapano, Sperandeo, Perris, Lanzaro, & Maj, 2001). However, obsessions without compulsions can be seen more in adolescents, than in children (Geller et al., 2001).

The mean age of onset in juvenile OCD is typically reported to be around 10.4 years (range 6.9–12.5 years)(Stewart et al., 2004). Boys may be more likely to have a prepubertal onset (around the age of 9) than girls may (female patients report the onset of symptoms during puberty around 11 years old). Some studies have estimated that the relative predominance of OCD in males and females is 3 to 2. However, this has not been confirmed in all of the relevant studies (Geller et al., 1998).

From adolescence onward, the prevalence in boys and girls is the same (Walitza et al., 2011). In male patients, it is more likely to have a family member affected by OCD or tic disorder (Swedo et al., 1989). Studies of adult OCD have suggested that age of onset may be bimodal, with the first peak occurring in puberty (30–70% of adults recall the presence of symptoms in adolescence), and the second in early adulthood (mean age 21 years) (Pauls, Alsobrook, Goodman, Rasmussen, & Leckman, 1995; Rasmussen & Eisen, 1992). These observations suggest that adolescence can be a period in which genetic and environmental etiological factors in OCD change in a relatively short period of time (Van Grootheest et al., 2008).

Apparently there is no significantly intercultural difference in the phenomenology of OCD even between industrialized and developing country (Honjo et al., 1989; Swedo et al., 1989). As the clinical experience asserts, OCD in all age groups, specially in younger sufferers, is under recognized and the diagnosis is correctly made 17 years following the onset (Hollander, Weilgus Kornwasser, & Wong, 1997). The limited amount of data from childhood can be attributed to different factors such as the common absence of egodystonia (Presta et al., 2003) and the reluctance of parents to consult with the psychiatric practitioners and the frequent misdiagnosis. Adolescents are also known to be secretive about their symptoms and disorders (Jenike, 1989) and not always recognized the pathological nature of their symptoms (Scahill et al., 1997). Therefore, when afflicted young patients are asked specific questions about OCD they identify their symptom very reliably.

1.2. Epidemiology of OCD and its symptoms among adolescents

Epidemiological data show that OCD is far more common among older adolescents than was previously believed (Maggini et al., 2001; Valleni-Basile et al., 1994). However, it may be lower

in children (Carter et al., 2010; Heyman et al., 2001) and in young adolescents (Bryńska & Wolańczyk, 2005). Several authors have reported prevalence rates in the USA ranging from 0.1% to 2.9% (Flament et al., 1988; Lewinsohn, Hops, Roberts, Seeley, & Andrews, 1993; Reinherz, Giaconia, Lefkowitz, Pakiz, & Frost, 1993; Valleni-Basile et al., 1994). In European countries, similar findings have been reported. The prevalence rates have been 0.38% in Poland (Bryńska & Wolańczyk, 2005), 0.6% in Germany (Wittchen, Lachner, Wunderlich, & Pfister, 1998) and the UK (Heyman et al., 2001) and 1.0% in Holland (Verhulst, van der Ende, Ferdinand, & Kasius, 1997). Finally, the highest OCD prevalence has been found in New Zealand with a rate of 4.0% (Douglass, Moffitt, Dar, McGee, & Silva, 1995) although, the prevalence of OCD in the biggest British nationwide survey of children mental health showed a lowest rate of 0.25% (Heyman et al., 2001).

The most reliable study on the prevalence of obsessive-compulsive behavior in adolescents by applying LOI-CV is the work of Flament et al. (1988). They did a large longitudinal epidemiological study on over 5000, 14-17 years old adolescents using a two-step design. They found in the first stage that almost 2% of adolescents have obsessive preoccupations or behaviors. Thomsen (1993) applied LOI-CV on a population of 1,032 Danish adolescents aged 11–17 years and found that 4% of community sample of Danish adolescents had a total interference score reflecting probable clinical or subclinical OCD. However, an interview did not follow their study. Maggini et al. (2001), after doing an epidemiological survey in more than 2,800 high school students in Italy, found that 4.1% of subjects showed an interference score of 25 or more in LOI-CV, while 3.0% of students show OCD symptoms without interfering in normal life. In another study done in Poland (Bryńska & Wolańczyk, 2005) on more than 2,800 13 and 14 years old students, 5.5% of the population were suffering from obsessive compulsive

behaviors (LOI interference score>=25). In Spain, (Canals et al., 2012) examined more than 1,500 Spanish non-referred children and found the prevalence of 1.8% for OCD, 5.5% for subclinical OCD and 4.7% (LOI interference>=25) for OCD symptomatology. The epidemiological study of obsessive-compulsive symptoms among adolescents has the benefit of early detection and treatment to modify the degree of chronic impairment on future social adjustments.

1.3. OCD and Comorbidities

The comorbidity of OCD with other mental disorders has been well documented in clinical and community samples of adolescents (Geller et al., 2001; Geller et al., 2003; Hanna, 1995; Swedo et al., 1989). Comorbid disorders are reportedly present in 68% to 100% of cases and are thus the rule rather than the exception (Jans et al., 2007). The most common types of comorbidity are: anxiety disorders (generalized anxiety disorder, separation anxiety disorder, social phobia and panic attack), depressive disorders, tic disorders, attention deficit/hyperactivity disorder (ADHD), disruptive behavior disorders (oppositional defiant and conduct disorders) and autistic spectrum disorders (Canals et al., 2012; Fontenelle & Hasler, 2008; Langley, Lewin, Bergman, Lee, & Piacentini, 2010; Lewin, Chang, McCracken, McQueen, & Piacentini, 2010; Ruscio, Stein, Chiu, & Kessler, 2010; Ruta, Mugno, D'Arrigo, Vitiello, & Mazzone, 2010; Sheppard et al., 2010). The comorbidity rates of OCD with other anxiety disorders are generally high (Canals et al., 2012; Heyman et al., 2001; Tükel, Polat, Özdemir, Aksüt, & Türksoy, 2002). However, to the best of our knowledge, little is known about the association between OCD symptoms and other anxiety disorder symptoms, especially when these symptoms are not assessed with the same self-report instrument. Accordingly, we attempt to contribute to this area by the present study. Many studies (Brady & Kendall, 1992; Seligman & Ollendick, 1998) indicate that there is

a considerable overlap between anxiety and depressive symptoms among young sufferers when they are measuring by commonly used self-report questionnaires. Depression and OCD symptom normally accompany each other in many cases. An overwhelming need to perform rituals and the inability to get rid of obsessive thoughts can eventually lead to isolation, hopelessness and depressive symptoms (Grados, Labuda, Riddle, & Walkup, 1997). Assessing the comorbid anxiety and depression symptoms among adolescents with high OCD symptoms can improve our etiological knowledge of symptoms and help us apply different treatment strategies for overcoming the negative consequences of comorbid symptoms in daily life at school, home and society.

1.4. Cognitive etiology of OCD

1.4.1. OCD and dysfunctional obsessive beliefs

There is no consensus on the factors that explain OCD. Although, some authors have recently emphasized cognitive models as one of the most well articulated and well studied theoretical models for explaining OCD (Rachman, 1997; Salkovskis, 1999), others place more attention on the behavioral (Franklin et al., 1998). Information-processing (McNally, 2000), and neurobiological roots of OCD (Savage et al., 2000; Saxena & Rauch, 2000).

Individuals with OCD suffer from obsessions that generally accompany by compulsions. It has been proposed that non-clinical individuals also have intrusive thoughts (IT) with similar content to obsessions (Freeston & Ladouceur, 1993; Freeston, Rhéaume, & Ladouceur, 1996; Rachman, 1997; Salkovskis, 1999; Salkovskis, 1985; Salkovskis, 1989). Although IT and obsessions have similar content, they differ in that obsessions are more frequent and provoke more anxiety than ITs (Julien, O'Connor, & Aardema, 2007). The cognitive model of OCD proposes that the interpretation of ITs will determine whether they escalate into obsessions or not (Freeston et al.,

1996; Rachman, 1997; Salkovskis, 1985). Cognitive models suggest that people with OCD appraise the occurrence and content of their intrusions as significant, meaningful, and needing to be controlled (OCCWG, 1997; Rachman, 1997; Salkovskis, 1985). The crucial difference between people with OCD and non-clinical individuals would be the presence of OCD-related dysfunctional beliefs. In the absence of these beliefs, ITs are ignored more easily and do not lead to obsessions (Salkovskis, 1989). Six types of dysfunctional beliefs have been theoretically linked to OCD symptoms (Clark, 2004; Frost & Steketee, 2002): (a) inflated personal responsibility (the belief that one has the power which is pivotal to bring about or prevent subjectively crucial negative outcomes), (b) overestimating threat (the tendency to overestimate the occurrence of the negative events and believing that their occurrence is terrible), (c) perfectionism (the tendency to believe there is a perfect solution to every problem, that doing something perfectly (mistake-free) is not only possible, but also necessary), (d) intolerance of uncertainty (the belief that you should be completely certain that a negative event will not happen), (e) over-importance of thoughts (the belief that the mere presence of a thought means that thought is significant, or that merely thinking about a bad event will increase the probability of corresponding event including thought-action fusion beliefs; and (F) need to control intrusive thoughts (the belief that you should have complete control over your thoughts and it is possible).

 Several empirical investigations have studied the relation between dysfunctional obsessive beliefs and OCD symptoms. These researches are conducted by the "Obsessive Beliefs Questionnaire (OBQ)" developed by the Obsessive Compulsive Cognition Working Group (OCCWG, 1997, 2001, 2003, 2005) and consider it as the best available measure in terms of reliability, validity and content coverage. This measure was first introduced by 87 items and later reduced to 44 items (OBQ-44; OCCWG, 2003, 2005) and is comprised of three correlated

factors: a) the inflated responsibility and overestimation of threat (RT), b) the perfection and intolerance of uncertainty (PC) and c) the importance and need to control ones thoughts (ICT).

According to Tolin et al. (2006), a more robust relationship between OCD symptom dimensions and obsessive beliefs would be demonstrated if three patterns is being confirmed. Firstly, OCD symptom subtypes should be associated with at least some form of obsessive belief domains (the generality hypothesis). Secondly, the different obsessive belief domains should be related to OCD symptom subtypes in a meaningful way (the congruence hypothesis). Thirdly, patients with OCD should endorse obsessive beliefs more strongly than patients with anxiety disorders (the specificity hypothesis). Although strong evidence for the generality criterion has been reported in different studies (Tolin, Brady, & Hannan, 2008; Tolin, Woods, & Abramowitz, 2003), evidence for the specificity and congruence criteria has been inconsistent. For example, concerning congruence, it has been proposed that contamination symptoms of OCD derive from cognitions related to the overestimation of threat (Rachman, 2004). However, washing symptoms have been associated with inflated estimates of threat in some studies (Taylor et al., 2010; Tolin et al., 2008) and perfectionism, in others (Myers, Fisher, & Wells, 2008; Wu & Carter, 2008). In this thesis, I will try to contribute to these three hypotheses among adolescent population.

1.4.2. Congruence hypothesis: OCD symptoms subtypes and obsessive beliefs

In several studies, OBQ has been used in regression analysis to predict OCD symptoms. The following section summarizes these findings. In Table 1, you can see detail informations about instruments, participants and the obtained results. All regression analyses in Table 1 are controlled for general distress (depression and/or anxiety) except for Tolin et al. (2003) and Fitch & Cougle (2013).

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Washing compulsions and contamination obsessions are strongly associated with inflated responsibility and threat estimation (López-Solà et al., 2014; Myers et al., 2008; OCCWG, 2001, 2005; Taylor et al., 2010; Tolin et al., 2008; Tolin et al., 2003; Wheaton, Abramowitz, Berman, Riemann, & Hale, 2010). However, in other studies, washing compulsion is proposed as an attempt to achieve perfectionism (Fitch & Cougle, 2013; Myers et al., 2008; Summerfeldt, 2004; Wu & Carter, 2008). Nevertheless, Calamari, et al., (2006); Julien et al., (2006); Viar et al., (2011) and Abramowitz, Lackey &Wheaton, (2009) did not find any association between washing obsession and contamination compulsion and any obsessive beliefs.

Checking compulsion is related to perfectionism and intolerance of uncertainty in many studies (Abramowitz et al., 2009; Fitch & Cougle, 2013; Fonseca et al., 2009; Julien et al., 2008; López-Solà et al., 2014; OCCWG, 2005; Tolin et al., 2003; Wu & Carter, 2008). Checking symptom is also related to responsibility and over estimation of threat (López-Solà et al., 2014; Myers et al., 2008; Taylor et al., 2010; Tolin et al., 2003; Wheaton et al., 2010). However, Tolin, et al., (2008) found no relation between checking symptom and any kind of obsessive beliefs in a clinical OCD samples.

Hoarding is expected to have a relation with perfectionism / intolerance of uncertainty (Tolin et al., 2008). In some other studies hoarding is also shown to be associated with responsibility and threat estimation (Myers et al., 2008; Taylor et al., 2010; Tolin et al., 2003)

Mental neutralizing and obsessive symptoms, which involve religious, sexual, and violent obsessions along with neutralizing strategies (e.g., mental rituals, repeating, and simplistic behaviors) are related to the importance/control of thoughts (Abramowitz et al., 2009; Calamari et al., 2006; Julien, O'Connor, Aardema, & Todorov, 2006; Myers et al., 2008; Taylor et al.,

2010; Tolin et al., 2008; Tolin et al., 2003; Viar, Bilsky, Armstrong, & Olatunji, 2011; Wheaton et al., 2010). Furthermore, mental neutralizing and obsessive symptoms are also related to responsibility / threat estimation beliefs (López-Solà et al., 2014; Myers et al., 2008; Taylor et al., 2010; Tolin et al., 2003).

Ordering / symmetry symptoms are associated with perfectionism and intolerance of uncertainty in most of the studies (Calamari et al., 2006; Fitch & Cougle, 2013; Frost & Steketee, 2002; Julien et al., 2008; López-Solà et al., 2014; Myers et al., 2008; OCCWG, 2005; Summerfeldt, 2008; Taylor et al., 2010; Tolin et al., 2008; Tolin et al., 2003; Viar et al., 2011; Wheaton et al., 2010; Woods, Tolin, & Abramowitz, 2004; Wu & Carter, 2008). Taylor et al. (2010) and Lopez-Sola et al. (2014) found that ordering and symmetry rituals are also predicted by responsibility and threat estimation.

Hence, there are inconclusive results regarding which obsessive beliefs are associated with OCD symptoms. The inconsistencies can refer to the differences in statistical methods, sample size, and the way in which OCD symptoms were conseptualized and assessed. Different instruments show different associations between OCD symptom dimensions and obsessive beliefs.

1.4.3. The specificity of obsessive belief to OCD

They are inconsistent evidences regarding which obsessive beliefs are OCD-specific (endorsed more strongly by people with OCD than by people with other anxiety disorders) and which obsessive beliefs are OCD-relevant (endorsed equally by people with OCD and with other anxiety disorders)(OCCWG, 2001, 2003; Sica et al., 2004; Tolin, Worhunsky, & Maltby, 2006; Anholt et al., 2004).

Sica et al. (2004) in their study on psychometric properties of the OBQ-87 on Italian population found that OCD patients scored significantly higher than non-clinical controls on every subscale and scored higher than GAD patients on all scales except OBQ overestimation of threat. GAD patients scored significantly higher than non-clinical controls in OBQ intolerance of uncertainty, overestimation of threat, control of thoughts and Perfectionism.

In an examination of the revised OBQ-44 subscales using a large sample (OCCWG, 2005), OCD patients scored significantly higher than Anxiety Control (AC) on Responsibility/Threat Estimation and Importance/Control of Thoughts, but not on Perfectionism/Certainty. However, this study did not control for symptoms of general distress such as anxiety and depression. Thus, an alternative hypothesis is that the belief domains measured by the OBQ are the characteristics of psychopathology and anxiety in general. Therefore, the OCD patients were simply more anxious or depressed than the AC patients.

Tolin et al. (2006) found that perfectionism/certainty and importance/control of thoughts, but not responsibility/threat estimation, were endorsed more strongly by OCD patients than by AC group. However, when depression and anxiety were controlled separately, there was no significant difference for the belief domains between OCD and anxious participants, and few differences for the belief domains between OCD and non-clinical participants were found. This finding supports the earlier hypothesis that the OCD patients are just more anxious or depressed than patients with anxiety disorders.

Julien et al, (2008) found that OCD patients scored significantly higher than the AC group and non-clinical samples on the OBQ-44 total score, and on all of its three subscales. The AC patients scored significantly higher than non-clinical control on the OBQ-44 total score, and on

responsibility/threat estimation and importance/control of thoughts subscales, but not on the perfectionism/certainty. Further analysis shows that patients with OCD support obsessive belief more strongly than anxious or non-clinical participants when general distress is not present. After controlling for general distress, the difference between OCD and anxious group disappeared. Therefore, support for specificity hypothesis is less conclusive when general distress is controlled.

Belloch et al. (2010) found that although OCD patients differed from non-clinical control on all of the OBSI-R[1] subscales, no evidence of OCD-specificity emerged for any of the measured obsessive beliefs , because the OCD subjects did not differ from depressed and non OCD anxious patients in obsessive beliefs.

Viar et al. (2011), in their study on a clinical sample, found that OCD and GAD groups scored significantly higher on the RT, PC, and ICT (P<.001) subscales compared to non-clinical control. However, the OCD and GAD groups did not differ significantly from each other on any of the OBQ subscales (P<.05). The findings of this study failed to support the specificity criterion. However, the lack of evidence for specificity in this study also strengthen this possibility that obsessive beliefs are more strongly related to psychopathology in general than to OCD. The absence of evidences for specificity criteria may suggest that obsessive beliefs may be transdiagnostic. This observation is consistent with research that has shown that obsessive beliefs and OCD symptoms are best conceptualized as a continuum that is present to a greater or lesser extent in all individuals (Haslam, Williams, Kyrios, McKay, & Taylor, 2005; Olatunji, Williams,

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[1] Obsessive Belief Spanish Inventory-Revised, a 50-item self-report questionnaire with eight subscales: Inflated responsibility ; Over-importance of thoughts ; Thought action fusion-likelihood ; Thought action fusion-moral ; Importance of controlling one's thoughts ; Overestimation of threat ; Intolerance of uncertainty , and Perfectionism

Haslam, Abramowitz, & Tolin, 2008). Table 2 summarizes the findings for the specificity hypothesis.

1.5. Dysfunctional obsessive beliefs in anxiety disorders

1.5.1. Intolerance of uncertainty (IU)

Several early and current psychological theories proposed that the tendency to avoid uncertain situation may play a central role in the development and maintenance of anxiety and mood psychopathology (Dugas, Freeston, & Ladouceur, 1997; Frost et al., 1997; Hammen & Cochran, 1981; McFall & Wollersheim, 1979).

Obsessive Compulsive Cognitions Working Group (OCCWG)identified IU in 1997 as one of the six beliefs that contribute to OCD. Intolerance of uncertainty is defined as "the belief that uncertainty, newness, and change are intolerable because they are potentially dangerous" (Frost et al., 1997, p. 669).

While the OCCWG was identifying OCD-relevant cognitions, a separate group of investigators identified IU as a key variable in generalized anxiety disorder (Dugas, Ladouceur, Boisvert, & Freeston, 1996 ; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1994; Ladouceur, Talbot, & Dugas, 1997). They defined IU within GAD literature as a "dispositional characteristic that results from a set of negative beliefs about uncertainty and involves the tendency to react negatively on an emotional, cognitive, and behavioral level to uncertain situations and events" (Buhr & Dugas, 2009, p. 216; Freeston et al., 1994).

 IU is defined as the unwillingness to tolerate the probability of negative events in the future, no matter how low is their probabilities (Freeston et al., 1994). The IU model outlines two feedback loops: 1) cognitive avoidance such as thought suppression, distraction and thought replacement

in OCD; 2) negative problem orientation that involves low problem-solving confidence in GAD (McEvoy & Mahoney, 2012).

There are several evidences that indicate that IU is a cognitive vulnerability factor for worry (Berenbaum, Bredemeier, & Thompson, 2008; Koerner & Dugas, 2008; Ladouceur, Gosselin, & Dugas, 2000; Sexton, Norton, Walker, & Norton, 2003; van der Heiden et al., 2010) and may be an important maintaining factor for GAD (Behar, DiMarco, Hekler, Mohlman, & Staples, 2009; Dugas, Gagnon, Ladouceur, & Freeston, 1998).Worry may play a protective role in that it prepares individuals for the occurrence of anticipated negative outcomes (Dugas, Schwartz, & Francis, 2004). These individuals believe that worry will serve to help them cope with feared events more effectively or to prevent those events from occurring at all (Borkovec & Roemer, 1995; Davey, Tallis, & Capuzzo, 1996). In OCD, compulsions reduce the distress associated with fears of uncertain events (Tolin et al., 2003). IU has been found to be a more robust predictor than several other proposed maintaining factors such as positive meta-beliefs, negative problem orientation, cognitive avoidance, perfectionism, perceived control, and intolerance of ambiguity in GAD comparing to other anxiety disorders (Buhr & Dugas, 2006; Dugas et al., 2005; Ladouceur et al., 1999; Laugesen, Dugas, & Bukowski, 2003). IU exacerbates "what if…" thinking (Dugas et al., 1998) that may lead to anxiety. Figure one, bellow, is a schema that explains how intolerance of uncertainty leads to demoralization and exhaustion.
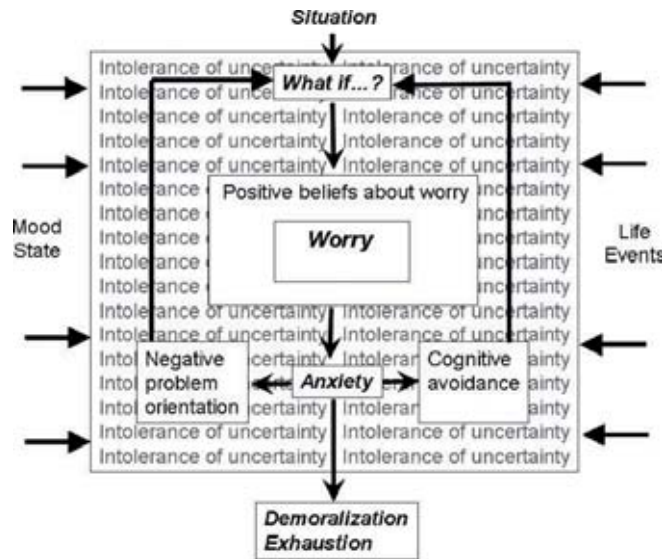
Figure 1. The intolerance of uncertainty model of GAD (Adapted from Michel Joseph Dugas & Robichaud, 2007)

Sica et al. (2004) and Steketee, Frost, & Cohen, (1998) found that IU-related beliefs were more strongly related to OCD than to other anxiety disorders. Tolin et al. (2003) suggests that there is an association only between IU and checking and repeating compulsion. They found that OCD patients with other obsessions and compulsions did not have higher levels of IU than control group. Holaway, Heimberg, & Coles, (2006) found that IU was equally associated with symptoms of GAD and OCD, compared to control group. As Fergus and Wu (2010) discovered, IU was the only cognitive appraisal that significantly predicted both GAD and OCD symptoms when other cognitive beliefs and general distress were controlled. Nevertheless, in their study, IU showed a significantly stronger specific relation with OCD symptoms than with GAD symptoms.

Different studies have shown significant associations between IU and social anxiety. IU has been found to explain unique variance in symptoms of social phobia, even after controlling for fear of negative evaluation, anxiety sensitivity, positive and negative affectivity, low self-esteem, worry, and neuroticism (Boelen & Reijntjes, 2009; Carleton, Collimore, & Asmundson, 2010).

Although IU is primarily studied in relation to anxiety disorders, recent theories suggest that IU may lead to major depressive disorder (MDD) through pathways similar to those proposed for GAD. Over-identification of problems and negative problem orientation associated with IU have been hypothesized to result in depressive as well as anxiety symptoms (Yook, Kim, Suh, & Lee, 2010). However, several studies, including a meta-analysis (Gentes & Ruscio, 2011), show that IU is more closely tied to anxiety than depression (Fergus & Wu, 2011; Holaway et al., 2006). De Jong-Meyer, Beck, & Riede, (2009) found that, in a community sample, IU was more strongly correlated with depression than anxiety symptoms. They also found that IU continued to be significantly associated with depression even after controlling for metacognitive beliefs. Recently, van der Heiden et al., (2010) found that the relation between neuroticism and depression symptoms is mediated by both IU and negative meta-cognitions in a clinical sample.

The diversity of ways in which IU has been defined might be a reason that IU has been claimed to be associated with various forms of psychopathology (depression and anxiety disorders) (Boelen & Reijntjes, 2009; McEvoy & Mahoney, 2011). In fact, independent groups of researchers use different measures to assess IU. The IUS and the OBQ are created specifically to assess IU in relation to GAD and OCD. Thus, the IUS may always be more strongly related to symptoms of GAD while the OBQ may always be more strongly related to symptoms of OCD. Although the two measures are correlated, they are not redundant (r=.59; Fergus & Wu, 2010). The Intolerance of Uncertainty Scale (IUS) assesses beliefs that (a) uncertainty is stressful and upsetting, (b) uncertainty leads to the inability to act, (c) uncertain events are negative and should be avoided, and (d) being uncertain is unfair (Buhr & Dugas, 2002). In comparison, the OBQ assesses beliefs that (a) certainty is necessary, (b) unpredictable change cannot be coped

with, and (c) adequate functioning is difficult in inherently ambiguous situations (Frost et al., 1997).

The Increased knowledge of IU as a shared and transdiagnostic feature of anxiety and depressive disorders may have several benefits (Starcevic & Berle, 2006). First, it may provide insight into comorbidity, classification, and etiology of anxiety disorders. For instance, if IU is shared by these disorders, it may help explain their common features and frequent comorbidity (Grant et al., 2005). Second, it can help in the development of parsimonious treatments that are useful for a group of disorders. Some clinicians have already begun to target IU as a point of intervention for multiple anxiety disorders, including GAD and OCD (Grayson, 2004; Ladouceur et al., 2000).

1.5.2. Perfectionism

Perfectionism is a multi-dimensional construct focused on the setting of unrealistic high standards accompanied by overly critical self-evaluations (Frost, Heimberg, Holt, Mattia, & Neubauer, 1993). Perfectionism becomes pathological when the individual is intolerant of making mistakes or failing to keep certain standards and thus he/she feels that nothing good enough is done (Frost, Marten, Lahart, & Rosenblate, 1990). As Hamachek, (1978) asserts, perfectionists "are motivated not so much by a desire for improvement as they are by a fear of failure"(P.29) and people with perfectionism "may over-value performance and undervalue the self" (p. 29).

Perfectionism has been discussed in the etiology and maintenance of different psychological disorders such as OCD, eating disorders and anxiety disorders (GAD and social anxiety disorder) and depression (Shafran & Mansell, 2001). Different dimensions of perfectionism often show different associations with disorders and symptoms (Donaldson, Spirito, & Farnett, 2000; Hewitt

et al., 2002). Up to now, the most validated and widely used instrument to measure different dimensions of perfectionism is Frost's Multidimensional Perfectionism scale (FMPS) (Frost et al., 1990). This measure contains 6 factors: (1) Concern over mistakes (CM); (2) Doubts About actions (DA); (3) Parental criticism (PC); (4) Parental Expectations (PE); (5) Personal standards (PS); (6) Organization (O).

Perfectionism has been linked to OCD in the literature for the past 100 years (Frost, Novara, & Rheaume, 2002). There are evidences that OCD samples have significantly elevated scores on the subscales of CM, PS and socially prescribed perfectionism (SPP)[2] compared to control group (Antony, Purdon, Huta, & Swinson, 1998; Buhlmann, Etcoff, & Wilhelm, 2008; Frost & Steketee, 1997; Frost, Steketee, Cohn, & Griess, 1994; Sassaroli et al., 2008). Libby et al, (2004) have studied different cognitive appraisals, including perfectionism, among 11-18 years old adolescents diagnosed by OCD and other anxiety disorders. The results showed that adolescents with OCD had significantly higher scores on the concern over mistakes scale than both non-clinical and other anxiety-disordered groups. Perfectionism may interfere OCD patients' ability to engage in tasks of exposure and response prevention (Frost et al., 2002).

Early research found positive associations between perfectionism and depressive symptoms and diagnoses (Leon, Kendall, & Garber, 1980; Robins & Hinkley, 1989; Steiger, Leung, Puentes-Neuman, & Gottheil, 1992). Huggins, Davis, Rooney, & Kane,(2008) in their study among 768 Australian children, 10–11 years old, assessed the relation between depression and different dimension of perfectionism. They found that in 50 children who met the criteria for a

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[2] SPP=requirements perceived by the individual that others require him/her to be perfect. SPP can consist of parental expectations or criticisms.

depressive disorder, SPP was the only predictor of diagnostic status. They concluded that SPP might be a more robust predictor of depressive symptoms in children because children may be more influenced by parent–child dynamics than adults.

Perfectionism has a strong association with anxiety (Frost & DiBartolo, 2002). An interesting finding by (Wirtz et al., 2007) shows that higher perfectionism on the FMPS has been linked to higher levels of cortisol response to stress. Theoretically, perfectionism is relating to anxiety and worry through increased concerns over the consequences of mistakes. That is, the threat of mistakes will cause a perfectionistic child to worry or feel anxious about not meeting expectations (Flett, Coulter, Hewitt, & Nepon, 2011). On the other hand, perfectionist children may see worry as a beneficial process helping them avoid future negative mistakes (Gosselin et al., 2007). These children show a poor problem orientation and hardly have a control on problem-solving process. A poor problem orientation is often linked with excessive worry in patients with GAD (Davey, 1994; Ladouceur, Blais, Freeston, & Dugas, 1998). Perfectionistic thinking can also acts as a specific pathway to worry. It may prepare an individual to worry in order to use avoidance, or as an act of problem-solving to reduce distress associated with that thought (Affrunti & Woodruff-Borden, 2014). However, there is not any empirical evidence of the relation between perfectionism and GAD in clinical sample (Egan, Wade, & Shafran, 2011).

The cognitive-behavioural theory of social anxiety argues that perfectionism serves to prepare socially anxious individuals to expect negative social interactions and this can result in social anxiety (Juster et al., 1996). In clinical samples, socially anxious individuals have significantly elevated perfectionism on CM and SPP subscales compared to control groups(Antony et al., 1998; Juster et al., 1996; Saboonchi, Lundh, & Öst, 1999).

Affrunti & Woodruff-Borden (2014) named three factors (temperament, effortful control[3] and executive functioning of the cognitive shifting[4] and finally intolerance of uncertainty) as having mediating or moderating relation to perfectionism. This mediating relation has been studied in OCD. According to OCCWG, the cognitive process of perfectionism acts in conjunction with IU in OCD. That is the pursuit of perfectionism is an attempt to increase certainty about future outcomes that are experienced as uncertain and distressing (OCCWG, 1997). The latest finding (Reuther et al., 2013) also confirms that the relation between perfectionism and OCD symptoms is fully driven by IU.

1.5.3. Responsibility and Threat estimation (RT)

Cognitive appraisals of threat estimation (including perceived severity and probability of harm) and responsibility for harm are central processes in the cognitive theory of OCD (Rachman, 1993; Salkovskis, 1985, 1989). This theory asserts that the normal intrusive turn to clinical obsessions by the faulty or dysfunctional beliefs regarding inflated responsibility for harm accruing for themselves or others (Barrett & Healy, 2003). This responsibility is defined as "the belief that one has power to bring about or prevent subjectively crucial negative outcomes" (Salkovskis et al., 1996). Responsibility and threat estimation (RT) involve misperceptions of the probability and severity of aversive events outcomes (OCCWG, 1997). Salkovskis (1985, 1989) proposed that personal responsibility for harm to self or others leads to increased discomfort and anxiety, increasing neutralizing behaviours, avoidance behaviours, and thought suppression.

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[3] Effortful control is the ability to inhibit a dominant response in order to perform a subdominant response, allowing an individual to regulate his/her behavior in certain circumstances (Rothbart, Ellis, & Posner, 2004).

[4] Cognitive shift is the ability to flexibly switch attention and cognitive sets or strategies.

A considerable number of studies have found moderate to strong support for specific relation of inflated responsibility, probability, and severity of harm with obsessive-compulsive symptoms. These studies suggest that this process is specifically relevant to the maintenance of OCD (Freeston et al., 1996; Shafran, 1997; Steketee et al., 1998; Van Oppen & Arntz, 1994).O'leary, Rucklidge, & Blampied (2009) found that IR was more prominent in those with OCD, compared with those with other anxiety disorders. Although correlational analyses confirm that a high sense of responsibility is associated with high levels of obsessionality even after controlling for TAF and depression, this relationship cannot be assumed to be OCD specific because IR beliefs were also present in anxious individuals without OCD.

Different studies focused on examining the responsibility and threat estimation processes in children and adolescent population. The Barret & Healy (2003) study on 59 children diagnosed by OCD, other anxiety disorders, and non-clinical control group revealed that while OCD children reported the highest appraisals of severity and responsibility, they did not differ significantly from anxious children on these cognitive processes. Libby et al. (2004) compared 118 adolescents with OCD, other anxiety disorders, and non-clinical control group on different measures of cognitive appraisals (TAF, perfectionism and inflated responsibility). They found that young people with OCD have significantly higher score on inflated responsibility than other groups and inflated responsibility independently predicting OCD symptom severity. Verhaak & de Haan (2007) in their study on 39 children and adolescents with OCD, found significant correlations between the Children's Yale-Brown obsessive compulsive scale (CY-BOCS) total and obsession subscale and physical threat[5], and personal failure[6] subscales of the Children

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[5] Containing statements referring to the overestimation of threat, for example 'something awful is going to happen'.

Automatic Thoughts Scale (CATS). For the adolescent subgroup, the correlations on the same measure were even higher.

RT is an important process in the cognitive conceptualization of anxiety disorders (Mathews, 1990; Salkovskis 1996; Tolin et al., 2006). Blackburn & Davidson (1995), following Beck, Emery, & Greenberg (1985), proposed that anxious patients have a general cognitive style characterized by excessive perception of threat and appraisal of the future. Anxiety-associated, threat-related cognitive contents have been encountered frequently in patients with depression as well (Butler & Mathews, 1983; Greenberg & Beck, 1989). In contrast to the depression-specific cognition "hopeless pessimism", no "anxiety-related appraisal characteristics have been found that typically discriminate anxiety from depression'' (Riskind, 1997, p.687).

IR can increase the misinterpretation of significance of thoughts in anxiety disorders. For example, IR could contribute to the ''worry about worry'' feature in GAD by exaggerating the individuals' beliefs that they are personally responsible for keeping order and control in their lives and improving the intolerance of uncertainty that is the main feature of GAD (O'Leary, Rucklidge, & Blampied, 2009).

Although Fergus and Wu (2010), in their study on non-clinical students, found that RT and PC predict GAD symptoms, we could not find any study that has examined the specific relation between RT and GAD symptoms. However, negative problem orientation process (NPO) is similar to RT. Both RT and NPO involve the high perceptions of threat, accompanied with the inflated sense of responsibility and perceived inability to cope adequately with a relevant threat (Fergus & Wu, 2010). On the other hand, NOP has been thought to be specific to worry.

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[6] Containing statements referring to inflated responsibility, for example 'it's my fault that things have gone wrong'.

Therefore, we might expect that RT is also associated with GAD. These similarities suggest the possibility of non-specific relations of this construct to OCD.

1.5.4. Importance and control of thoughts (ICT)

Individuals with OCD frequently feel that having intrusive thoughts means they must want those events to occur. An inability to control such thoughts is seen as an indictment of character and may lead to an increased need to control one's thoughts (OCCWG, 1997). Research indicates that individuals with OCD differ from both non-clinical and anxious control samples on elevated importance and control of thoughts and that the related construct of thought action fusion (TAF) distinguishes obsessive from worrisome features (Coles, Mennin, & Heimberg, 2001; Tolin et al., 2006). Compared to the other cognitive beliefs, ICT appears less relevant to GAD because worry is viewed as a voluntary behavior in response to a known cue (Turner, Beidel, & Stanley, 1992).

Recently, Fergus and Wu (2010) have studies the specificity of obsessive beliefs measured by OBQ and other cognitive processes in relation to symptoms of GAD and OCD in a large nonclinical sample. They found that both GAD and OCD symptoms correlated significantly (P<.01) with all cognitive variables. All of the cognitive processes correlated significantly stronger with anxiety and OCD than with depression. They found that ICT was more strongly related to OCD symptoms than to GAD symptoms. ICT was no longer a significant predictor of GAD symptoms after controlling for RT and PC and general distress (partial r = -.09) or after controlling for IU and NPO and general distress (partial r = -.01).

1.5.5. **Thought Action Fusion (TAF)**

Rachman (1993) suggested that OCD may be triggered by specific beliefs about the power and significance of thoughts. He called these beliefs as thought action fusion (TAF). This concept refers to the idea that (a) unwanted thoughts about unpleasant actions are equivalent to the actions themselves (moral TAF) and (b) thinking about unwanted event makes the event more probable (likelihood TAF).

The cognitive theory of OCD (Rachman, 1998; Salkovskis, 1999) has implicated that TAF is relevant to the development and maintenance of obsessional problems for two reasons. First, if people with OCD believe that their unacceptable thoughts are the moral equivalent of actions, they will feel extremely distressed because of having such thoughts. Second, if they believe that thinking such thoughts increases the likelihood of an unwanted event, they may engage in neutralizing behaviors to prevent the occurrence of disastrous consequences via avoidance or compulsive rituals (Abromwitz, Whiteside, Lynam, Kalsy, 2003).

In different researches in adult population, the contribution of TAF in OCD, depression and other anxiety disorders (especially GAD) has been studied (Abramowitz, Whiteside, Lynam, & Kalsy, 2003; Coles et al., 2001; Hazlett-Stevens, Zucker, & Craske, 2002; O'Leary et al., 2009; Rachman, Thordarson, Shafran, & Woody, 1995; Rassin, Diepstraten, Merckelbach, & Muris, 2001). There is a question that how might TAF play a role in anxiety disorders besides OCD? One possibility is that TAF is related to worry, which is a key feature of trait anxiety. Although different researches suggest that worry involves meta-cognitions that are similar to TAF but there is a noticeable difference between likelihood TAF in GAD comparing to OCD. This difference is related to the direction of the beliefs in both disorders. That is, worriers appear to

believe that their worry prevents feared negative outcomes to be happened, whereas OCD individuals fear their obsessions because they believe that their obsessions could cause feared negative events to occur. Thus, the belief that thoughts can influence events is possibly shared across the two disorders. The stronger relation between TAF and OCD compared to that between TAF and worry might also reflect that the TAF scales were designed to measure the degree to which thoughts are believed to cause aversive events (Hazlett-Stevens, Zucker, Craske, 2002).

According to (Farrell & Barrett, 2006), there are no apparent age-related differences on self-reported or idiographic ratings of TAF. They suggest that TAF is likely to be associated with OCD in childhood to a similar degree as it is in adolescence and adulthood. Elkind (1967) has argued that the emergence of formal operations results in young people, believing that they are the focus of others' attentions and that they are unique and omnipotent. This cognitive backdrop may make young people more likely to report thought–action fusion. We found only four major studies that examined the relation between TAF beliefs and OCD symptoms in children and adolescents. Muris, Meesters, Rassin, Merckelbach, & Campbell (2001) found that TAF was significantly associated with symptoms of OCD (r=0.34) among a non-clinical sample of adolescents aged 13–16 years. Similarly, Bolton, Dearsley, Madronal-Luque, & Baron-Cohen (2002) found a relation between TAF beliefs and obsessive-compulsive thoughts (r=0.43) and behaviors (r=0.36) in a non-clinical sample of 127 children between 5 and 17 years old.

Barrett & Healy (2003) found higher ratings of TAF beliefs in children with OCD compared with non-clinical controls, while they were not significantly different from anxious children. In addition Libby, Reynolds, Derisley, & Clark (2004) found that young people with OCD obtained significantly higher scores on the TAF-likelihood-other scale than anxious and non-clinical

adolescents. Nevertheless, none of these studies discusses which specific OCD behavior is associated with TAF beliefs.

Summarizing different findings, we can say that TAF has been consistently associates with OCD features and OCD but TAF is by no means specific for OCD because beliefs about importance and implication of certain thoughts may also characterize other conditions especially GAD, depression, and some psychotic states (Starcevic & Berle, 2006).

According to O'leary, Rucklidge, & Blampied (2009),TAF is a relatively normal phenomenon that occurs when the content of concerns is in contrast to some moral or cultural value and/or the thoughts are particularly enmeshed with the individual's sense of self (ego-syntonic OCD). This process may also be affected by age because, after years of living with the disorder, individuals with long-established OCD may have experienced a certain degree of actuarially incorrect but psychologically real negative reinforcement, in that their thoughts can make things happen and their neutralizing thoughts or action have been successful in preventing harm.

Table 1. Regression analyses predicting OCD symptoms, assessed by long or short versions of the obsessive beliefs questionnaire (OBQ)

Study	Sample	OBQ version	OCD measure	OCD symptom	Checking	Hoarding	Neutralizing	Obsessing	Ordering	Washing
Tolin,Woods & Abramowitz (2003)	554 students	Long	OCI-R	Beliefs that were significant (p<.05) predictors of obsessive compulsive symptoms	T	T	T,I	T,C	P	T
OCCWG (2005)*	179 patients	short	Padua inventory		PC	___	___	___	PC	RT
Julien, O'Connor, Aardema, Todoroval (2006)*	126 patients	Short	Padua Inventory		PC	___	___	___	PC	None
Myers, Fisher&Wells (2008)*	238 patients	Short	OCI-R		T,ICT	T	T,ICT	T,ICT	T,PC	T,PC
Tolin, Brady and Hannan (2008)*	99 patients	Short	OCI-R		None	PC	RT	ICT,PC	PC	RT
Abramowitz, Lackey, & Wheaton(2009)*	353 students	Short	OCI-R		PC	None	None	ICT	None	None
Taylor et al.(2010)*	5,015 students	Short	OCI-R		RT	RT	RT,ICT	RT,ICT	RT,PC	ICT,RT
Viar et al.(2011)*	368 students	Short	DOCS		___	___	___	ICT	PC	None
Wheaton, Abramowitz, Berman, Riemann,Hale (2010)*	135 patients	Short	DOCS		___	___	___	ICT	PC	RT
Fonseca et al.(2009)*	508 adolescents	Short	MOCI		T,PC	___	___	___	___	PC,T
López-Solà et al. (2014) **	86 patients and 220 students	Short	OCI-R		RT, students PC, patients	___	___	RT	RT&PC, students PC, patients	RT
López-Solà et al. (2014) *	86 patients and 220 students	Short	DOCS		RT, students & patients	___	___	RT	RT,PC and ICT student PC, patients	RT
Fitch & Cougle (2013)	Approximately 150 students in each study	Short	SOAQ & VOCI		PC	___	___	___	PC	PC

Note. Subscales of long version of OBQ: R = Inflated Responsibility; T = Overestimation of Threat; P = Perfectionism; I = Importance of Thoughts; C = Control of Thoughts. Subscales of short version of OBQ: ICT = Importance and Control of Thoughts; PC = Perfectionism and Intolerance of Uncertainty; RT = Responsibility and Overestimation of Threat. OCI-R = Obsessive-Compulsive Inventory–Revised. OCCWG = Obsessive- Compulsive Cognitions Working Group. DOCS=Dimensional Obsessive-Compulsive Scale.MOCI= Maudsley Obsesional Compulsive Inventory. SOAQ= Symmetry, Ordering, and Arranging Questionnair. VOCI= Vancouver Obsessive–Compulsive Inventory

*Controlling for general distress (depression and/or anxiety)

The summery of findings in Table 1

- Checking is predicted by PC and RT/T in half of the studies.
- Obsessing is predicted by ICT in half of the studies and by RT/T in 40% of studies.
- Neutralizing is predicted by RT/T in 33% of studies and by ICT/I in 25% of studies.
- Hoarding is predicted by RT/T in 25% of studies.
- Washing is predicted by RT/T in 75% of studies and by PC in 25% of studies.
- Ordering is predicted by PC/P in 90% of studies and by RT/T in 33% of studies.

Table 2. Empirical evidences for the specificity hypothesis

	OCCWG (2005)*	Tolin et al. (2006)*	Julien et al. (2008)*	Viar et al. (2011)	Belloch et al. (2010)**	Sica et al. (2004)
Resp/threat	OCD>AC>NCC	OCD, AC>NCC	OCD>AC>NCC	OCD,AC>NCC	Resp OCD, DC>NC, DC>NC Threat OCD,DC,AC>NC	Resp OCD>AC,NC Threat OCD,AC>NC
Perf/Cert	OCD>AC>NCC	OCD>AC>NCC	OCD>AC, NCC	OCD,AC>NCC	Perf OCD,DC>AC,NC Cert OCD,DC,AC>NC	Perf OCD>AC>NC Cert OCD>AC>NC
Imp/Ctrl Thgts	OCD, AC>NCC	OCD>AC>NCC	OCD>AC>NCC	OCD,AC>NCC	Imp OCD,DC>AC,NC Ctrl Thgts OCD,DC>AC,NC	Imp OCD>AC, NC Ctrl Thgts OCD>AC>NC

Note. OCD: OCD: obsessive–compulsive disorder; AC: anxious controls ;DC: Depressed control; NCC: non-clinical controls; Resp/Threat: Responsibility/ Threat Estimation; Perf/Cert: Perfectionism/Certainty; Imp/Ctrl Thgts: Importance/Control of Thoughts.

* Results are without controlling for general distress.

**All of the results in Table 2 is obtained by OBQ except the Belloch et al.(2010) that uses Obsessive Beliefs Spanish inventory –Revised (OBSI-R).

2. OBJECTIVES

2.1. Objectives of the first study

Since the prevalence of OCD symptoms among adolescents varies across studies, further research in community samples is needed to complete our knowledge on the phenomenology, prevalence and distribution of obsessive-compulsive behaviors.

In this regard our objectives in the first study are:

1- To estimate the prevalence, the phenomenology and the distribution of OCD symptom in a population of Spanish secondary school adolescents.

2- To explore the association of OCD symptom with anxiety symptoms severity such as separation anxiety, generalized anxiety, social/school phobia and panic/somatic symptoms.

3- To assess the association of OCD symptom with depression symptom severity.

2.2. Objectives of the second study

Although Reynolds & Reeves (2008), in their literature review, showed that cognitive models can be applied to children and adolescents, we could find only one study that examines the association between obsessive beliefs and OCD symptom among non-clinical adolescents. Fonseca et al. (2009) in their study among Spanish adolescents could not find any particular relationship between MOCI subscales and obsessive beliefs measured by OBQ-44. Their regression analysis indicated that Perfectionism/Intolerance of uncertainty (PC) and Threat estimation (T) were the unique predictors for obsessive-compulsive symptomatology. PC and T significantly predicted MOCI-total score and all of its four factors (checking, washing, doubting and Slowness). In our study, we replicated their study

with another self- report questionnaire that is especially designed for children and adolescents, and assesses more diversified OCD symptoms.

We have three objectives in this study.

1- To examine the relation between different OCD symptom and obsessive dysfunctional beliefs in a population of 966 adolescents.

2- To study the independence of relation between OCD symptoms and different obsessive beliefs by controlling for depression.

3- To assess the contribution of obsessive beliefs, such as inflated responsibility /overestimation of threat (RT), perfectionism/intolerance of uncertainty (PC), importance /need to control of thoughts (ICT) and thought action fusion (TAF) in predicting OCD symptoms among adolescent.

2.3. Objectives of the third study

1. To investigate whether OCD participants endorse obsessive beliefs such as inflated responsibility and overestimation of threat (RT), perfectionism and intolerance of uncertainty (PC), over importance and need to control of thoughts (ICT) and thought-action fusion (TAF) more strongly than participants with generalized anxiety disorder (GAD), social phobia (FS), and major depression and/or distimia (MDD/distimia) or not.

2. To study the relation between obsessive beliefs and OCD, depression and anxiety symptoms in all of the participants to see if there is a significant correlation between obsessive beliefs and OCD, depression and anxiety symptoms.

3. To see if there is a significant correlation between obsessive beliefs and OCD symptoms in different diagnostic groups.

3. METHODOLOGY
3.1. Participants

General characteristics of participants

The whole sample is obtained from the census of 2009 in the 2nd and 3rd of ESO in nine public and private schools (4 public and 5 private) in Rubi (N=1,324), a city near Barcelona. Rubi is selected for two main reasons. First, Rubi is a city with almost 73,000 inhabitants, according to the last report of the National Statistical Institute (INE, 2009). There are 11,593 (16%) foreigners, of which 2,071 are younger than 16 years old. Thus, it could be a representative region with a middle socio-economic class. The second reason is the interest of the administration of the educational system to collaborate with us in examining emotional problems, including depression and all anxiety symptoms and disorders in all secondary schools of this city.

This research went through two phases of data collection. In the first study, I worked with the data that obtained from the first phase and in the second and third study, I worked with the data that obtained from second phase.

The First phase took place between 4 February and 15 June 2010 in the academic year 2009-2010. During the days of assessment at school, 218 students were absent, Forty-three students were not authorized by their parents and two students did not show any interest in participating in this research. Due to the difficulties in understanding the language, six students could not answer the questionnaires. Therefore, the final sample included 1,061 adolescents, 497 girls (47.3%) and 554 boys (52.2%) in the 2nd and 3rd of ESO. The

participation ratio was 80%. The age of the participants ranged between 13 and 17 years old with the mean age of 13.92 years (SD=0.76). Almost 70% of the participants belong to middle and lower-middle socio-economic classes according to Hollingshead (1975). In the first phase, we applied socio-demographic questionnaire, LOI-CV, SCARED and CDI on all nine secondary schools in Rubi.

The second phase took place in September 2010 and finished on 15 June 2011 in the academic year of 2010-2011. On the day of assessment at schools, 307 students were absent, 43 students were not authorized by their parents, and 2 students did not show any interest in participating in this research. Due to the difficulties in understanding the language (Spanish and Catalan), six students could not answer the questionnaires. Therefore, the final sample includes 966 students, 460 (47.6%) girls, and 506 (52.4%) boys in the 3nd and 4rd grades of ESO. The age of the participants ranged between 14 to 17 years old, with a mean age of 14.89 years (SD = 0.074). In this study, 78.8% of participants were Spanish and 21.1% were non-Spanish. The participation ratio was 70%. In the second phase we applied different self-report questionnaires such as LOI-CV, OBQ-44, TAF-A, CDI and SCARED and we ran a semi-structured clinical interview (ADIS-child version).

The students were selected to be interviewed depending on their scores on CDI, SCARED and LOI-CV. All of the students that got higher scores than cutoff in SCARED (score ≥ 25) and CDI (score ≥ 17) are selected. For LOI-CV we relied on two types of cut off according to Flamment et al, (1988). First, those with interference score ≥ 25 by considering just interference items and second, those with yes items score ≥ 15 and interference score ≤ 10 by considering both yes and interference items. We also randomly selected a control group

from the students that scored lower in cutoff in all of questionnaires (50 adolescents). This resulted in 654 cases and we interviewed all of them. All of the students in the control group were also interviewed.

After diagnosing the cases, we saw that most of these adolescents had more than one diagnosis. In these cases (when comorbidity is present), according to Julien et al.(2008), I have selected cases that had a given diagnosis as their most sever psychopathology (having a difference greater or equal to 2 points on the interference scale of the ADIS-IV according to assessor's rating). In the cases that there is not any possibility to find which is the most severe psychopathology (with the same interference scores on different diagnosis) I excluded them from sample. This criterion may let us have more concrete results about the contribution of obsessive beliefs in anxiety disorders than before.

Accordingly, we could obtain 16 adolescents OCD, 64 adolescents with social phobia, 52 adolescents with generalized anxiety disorder (GAD), and 47 adolescents with major depression and/or distimia. We randomly chose 50 non-clinical adolescents as a group of control (NCC).

The mean age of participants and gender in diagnostic groups are as follows:

In OCD, 43,7% of participants were male and 56,2% were female, all with the mean age 13,18 (SD=0,40).

In GAD, 42.3% of participants were male and 57,7% were female, all with the mean age 13,73 (SD=0,74).

In FS, 46% of participant was male and 57% was female, all with the mean age of 13,70 (SD=0,74).

In MDD/distimia 44,6% of participants were male and 55,3% of participants were femle, all with the mean age 13,74 (SD=0,76).

In group of control, 46% of participants were male and 54% of participants were female, all with the mean age of 13.70 (SD=0.75).

3.2. Procedure

The research was approved by the Ethics Committee in Human Experimentation and by the research committee of the Universitat Autonoma de Barcelona (UAB). The collaboration of all of the secondary schools located in Rubi, was requested. All of the schools accepted to participate in this study. Signed consent was required from parents and oral consent by adolescents. The time necessary for completing the questionnaires was about 50 minutes. During the assessment with the self-report questionnaires, two researchers were present in the classroom to answer possible questions about items. Once each student completed the questionnaires, researchers carefully checked the items to avoid missing data. In this research, all questionnaires were performed in Spanish and Catalan.

Semi-structured interviews (ADIS-C) were run on the cases that obtained from the first phase and on the group of control. The signed consent was required from parents and oral consent by adolescents. The interviews were individually performed, for approximately one hour.

3.3. Instruments

Anxiety Disorders Interview Schedule for DSM-IV; child version (ADIS-C; Silverman & Albano, 1996). The ADIS is a semi-structured interview that assesses the DSM-IV anxiety, mood and externalizing disorders experienced by school age children and adolescents and screens for additional disorders (like ADHD, anorexia nervosa, etc). Clinician Severity Rating (CSR) was generated for each diagnosis. A CSR rating, based on an 8-point scale (0 = *not at all*, 4 = *some*, 8 = *very, very much*), was used for each assigned diagnosis (Silverman and Albano 1996). A point of 4 or higher was required to meet criteria for a DSM-IV diagnosis. The ADIS has a high inter-rater reliability, retest reliability, and concurrent validity (Lyneham, Abbott, & Rapee, 2007; Silverman, Saavedra, & Pina, 2001; Wood, Piacentini, Bergman, McCracken, & Barrios, 2002).

Obsessive Beliefs Questionnaire (OBQ-44; OCCWG, 2005).This is a 44-item self-report measure of dysfunctional beliefs linked to the onset and maintenance of OCD. Initially developed as an 87-item measure, ensuing research by the Obsessive Compulsive Cognition Working Group(OCCWG) saw three factors emerge with 44 high-loading items. This led to three factor-derived subscales: Responsibility and Threat Estimation subscale (e.g., "Harmful events will happen unless I am very careful"), which includes 16 items that deal with cognitions related to preventing harm from happening to oneself and others (RT); 2) Perfectionism/Certainty subscale (e.g., "I must be certain of my decisions"), which is comprised of 16 items, including high absolute standard of completion, rigidity, concern over mistake and feeling of uncertainty (PC); and 3) Importance/Control of thoughts subscale (e.g., "Having nasty thoughts means I am a terrible person"), which includes 12 items concerning the consequence of having intrusive thoughts or images, thought action

fusion, and the need to get rid of intrusive thoughts (ICT). Participants rated to what extent they agree with different beliefs on a 5-point Likert scale, ranging from 0 (disagree very much) to 4 (agree very much). This measurement has shown good validity, internal consistency, and test-retest reliability (OCCWG, 2005; Tolin, Worhunsky, & Maltby, 2006). A psychometric property of OBQ-44 has been examined in non-clinical Spanish adolescents by Fonseca et al. (2009) and it showed a good psychometric property with an internal consistency between 0.77 and 0.86.

Leyton Obsessional Inventory –Child Version (*LOI-CV; Berg, Rapoport & Flament, 1986).* This is a 20-item self-report questionnaire that assesses the presence ("yes") or absence ("no") of a number of obsessive concerns and behaviors and the degree of interference of each behavior in personal functioning. LOI-CV explores general obsessive thoughts and rituals including repeating, checking, counting, indecisiveness, dirt-contamination fears, lucky numbers, and school-related habits. This instrument comprises two subscales. The first records the presence or absence of common obsessions and compulsions. Each response is scored 1 for the presence and 0 for the absence of the symptom. Therefore, this subscale yields a maximum score of 20. The second subscale records the degree of interference of the symptoms in the daily life of the subject. Each symptom is scored on a 4-point scale of 0–1–2–3, ranging from 0 – "this habit does not interfere with my life" to 3 – "I waste a lot of my time because of this habit". The maximum score in this subscale is 60. A response for the degree of interference is required only for the items endorsed on the symptoms subscale (Roussos et al., 2003).

LOI-CV is described in the literature as a reliable instrument with high sensitivity and

specificity for the screening of OCD (Flament et al., 1988). Among Spanish students

between 8-12 years old, LOI-CV obtained a total internal consistency of 0.79, 0.87 and

0.90 for the various Scores (Canals et al., 2011). LOI- CV showed an acceptable internal

consistency (α =0.79) in the most recent study conducted among 50 American children and

adolescents with OCD (Storch et al., 2011), but it was not significantly correlated with any

other measures of OCD symptom frequency or severity, OCD-related impairment and

global symptom severity in a pediatric OCD sample. In our study, internal consistency was

also good (α=0.75 for the "symptom presence score" and α=0.87 for the "interference

score"). Choosing this instrument as a widely used questionnaire for assessing obsessive-

compulsive preoccupations also allowed us to compare our results with previous studies.

Canals Sans, et al., (2011), in a Spanish population, obtained three factors that explained

46.30% of the variance. These factors were labeled order/checking/pollution (OCP),

obsessive concern (OC), and superstition/mental compulsion (SMC) (30.15%, 8.53% and

7.62% of the variance, respectively). The first factor has seven items that referred to

compulsive manifestations and obsessions around cleaning and ordering. The second factor

has seven items that referred to worries. The third factor includes six items that refer to luck

and numbers. In the present study, I rely on these factors to perform the statistical analysis.

The reliability found in the Spanish version was excellent (0.90 for the total score, 0.87 for

the interference score) and its validity as a screening test for OCD in a non-clinical

population was supported (Canals et al., 2012).

Thought–Action Fusion Questionnaire for Adolescents (TAFQ–A; Muris, Meesters, Rassin, Merckelbach, & Campbell, 2001).The Thought Action Fusion scale has 15 brief vignettes, each followed by an item. Eight of the items refer to the fusion of thoughts and action in terms of morality (e.g., "You meet a classmate. Suddenly without any reason you think of a term of abuse for this person, having this thought is almost as bad as abusing this person"). Seven items pertain to the fusion of thoughts and action in terms of likelihood. Among these, three items concern likelihood-others and four items pertained to likelihood-self, (e.g., "suddenly without any reason you have the thought that you are dying, having this thought increases the risk that you really are going to die"). Each item has to be rated on a 4- point Likert scale from 0 = "not at all true" to 3 = "very true". TAFQ–A total, morality, and likelihood scores can be calculated by summing across relevant items. Studies have shown that the TAF total, moral and likelihood subscales have good internal consistency (α= 0.83– 0.89) and correlate significantly with self-reports of obsessional problems (Rassin, Merckelbach, Muris, & Schmidt, 2001; Shafran et al., 1996).

In our study we adopted the validated version of TAF-A among Spanish adolescents (Fernández-Llebrés, Godoy, & Gavino, 2010). This measure was slightly adapted for children and adolescents to ensure that it is easily comprehendible. TAF-A has a high internal consistency (α = 0.86 - 0.90) and an acceptable temporal stability (interclass correlation between 0.63 and 0.68). Libby et al., (2004) demonstrated good psychometric properties for this measurement, including reliability coefficients for the TAFQ-A scales of more than 0.90, when used with young people.

In our study, I obtained good internal consistency for both TAF-moral and TAF-likelihood (0.86 and 0.87, respectively). we eliminated one item from TAF (item 3: "You are alone in a church standing in front of a large statue of Jesus. Suddenly you have the thought of spitting on the statue, Having this thought is almost as bad as really spitting on the statue") because it contains a religious bias that may not have any scenario for Muslim students, as well as the secular ones. We preferred to eliminate this item so as not to interfere with our results.

Child Depression Inventory (CDI; Kovacs, 1992). This is one of the most widely used self-report questionnaires to assess the severity of depressive symptoms in 7 to 17 year-old children and adolescents. It includes 27 items in which the scores range between 0 and 2 (total score ranges from 0 to 54). Children have to select the sentence from each group that best described themselves during the last 2 weeks. Good reliability ($\alpha = 0.81 - 0.85$) for this version was reported by Figueras, et al. (2010) in the Spanish community and clinical population.

Screen for Child Anxiety Related Disorders (SCARED; Birmaher, et al., 1997). This questionnaire assesses anxiety disorder symptoms in children and adolescents. It consists of 41 items that can be grouped into five subscales. Four of them assess anxiety disorders according to DSM-IV criteria: panic/somatic (e.g., "When frightened, my heart beats fast"), generalized anxiety (e.g., "I am a worrier"), separation anxiety (e.g., "I don't like being away from my family"), and social phobia (e.g., "I don't like to be with unfamiliar people"). The fifth subscale is school phobia (e.g., "I am scared to go to school") which represents a common anxiety problem in youths. SCARED has adequate internal consistency and test-

retest stability (Spence, 1998). SCARED is also validated and translated into Spanish by Domènech & Martinez, (2008).

Socio-demographic questionnaire. The subjects completed a socio-demographic questionnaire designed by the authors, asking about gender, date and place of birth, ethnic background, marital status of their parents, educational level of their parents and their employment status. In addition, we included indicators of the Hollingshead scale (Hollingshead, 1975) for evaluating the socio-economic status (SES) of their parents.

3.4. Statistical analysis

3.4.1. First study

Statistical analysis was carried out by PASW17 (SPSS software). According to the indication of Flament et al., (1988), two distinct groups of subjects were defined as 'positive' in the screening process. The first group, labeled 'high interference' (vs. low interference), was composed of adolescents with scores equal to or higher than 25 in the interference score. The second group, called 'high symptom presence', included adolescents with scores equal to or above 15 in the yes-no items and an interference score lower than 10. In fact, choosing Flament's indication, with the adequate reported sensibility (75%) and specificity (84%), allows us to compare our study with other research in this area.

After creating the groups in this study, the prevalence of adolescents with a high interference score and high symptom presence score was estimated. The prevalence of adolescents with a high interference scores (interference score equal to 3) and the

prevalence of all LOI-CV items was also estimated. The prevalence classified by gender was assessed through logistic regressions adjusted by participants' ages.

Linear regression, adjusted by children's gender, age, and SCARED total score, was used to explore the association between LOI-CV (for variables "symptom presence score" and "interference score") and CDI total score. This procedure also tested the association between LOI-CV and SCARED total score (considering total score and the five subscales). This analysis was adjusted by the covariates gender, age and the level of depressive symptoms severity (CDI total score).

The association between gender and LOI –CV scores was assessed by logistic regression (for binary classifications in LOI) and linear regression (for quantitative scores in LOI). All of these regressions were adjusted by participants' ages and the CDI total score.

3.4.2. Second study

All of the data analysis is carried out by PASW 20 (SPSS software). We performed Bivariate Pearson correlations between each of LOI-CV subscales, TAF subscales, OBQ-subscales, CDI-total, and SCARED-total in all of the participants. We computed a series of partial correlations in which the OBQ subscales were used to predict OC symptoms, while controlling for CDI. Partial correlation is deployed to examine the independence of the relations between the theoretical variables and OC symptoms. Finally, we fitted linear regressions for predicting the 3 LOI subscales from 3 OBQ and 2 TAF subscales in all of the participants. We Computed regression analysis to determine whether any of the OBQ and TAF subscales uniquely predicted OCD symptoms or not. The regression analysis is performed without controlling for general distress (depression and/or anxiety).

3.4.3. Third study

All of the data analysis is carried out by PASW 22 (SPSS software). One way ANOVA was deployed to compare 5 groups OCD, FS, GAD,MDD/distimia and NCC group on the three OBQ-44 and two TAF subscales and total scores . The post hoc comparisons (Bonferroni correction) are also performed.

For assessing the relation between different obsessive beliefs and clinical variables such as depression, anxiety and OCD symptoms I relied on Bivariate correlation analysis.

4. STUDY 1: OBSESSIVE-COMPULSIVE SYMPTOMS AMONG SPANISH ADOLESCENTS: PREVALENCE AND ASSOCIATION WITH DEPRESSIVE AND ANXIOUS SYMPTOMS

4.1. Objectives

1. To estimate the prevalence of OCD symptoms in the community sample of adolescents in the municipality of Rubi (Barcelona).we want to see how many children are

2. To explore the association of OCD symptoms with anxiety symptoms severity such as separation anxiety, generalized anxiety, social/school phobia and panic/somatic symptoms.

3. To assess the association of OCD symptoms with depression symptom severity.

4.2. Method

4.2.1. Participants

The sample included 1,061 adolescents, 497 girls (47.3%) and 554 boys (52.2%) between 13 to 17 years old. the mean age was 13.92 years old (SD=0.76).

4.2.2. Instruments

1. *Leyton Obsessional Inventory –Child Version* (LOI-CV; Berg, Rapoport, & Flament, 1986). This is a 20-item self-report questionnaire for assessing the presence of obsessive preoccupations and behaviors (yes score) and rating the interference of each behavior (interference score) in personal functioning.

2. *Screen for Child Anxiety Related Emotional Disorders* (SCARED; Birmaher et al., 1997). This questionnaire assesses anxiety disorder symptoms according to DSM-IV criteria in children and adolescents. It consists of 41 items.

3. *Children's Depression Inventory* (CDI; Kovacs, 1992). This questionnaire assesses the severity of depressive symptoms in 7 to 17 year-old children and adolescents. It includes 27 items in which the scores ranged between zero and two.

4. *Socio-demographic questionnaire (*Hollingshead, 1975).

4.3. Results

The association between gender, LOI high scores and LOI total scores

According to the indication of Flament et al. (1988), two distinct groups of subjects were defined as 'positive' in the screening. The first group, labeled "high interference" and consisting of adolescents with scores equal to or higher than 25 in the interference score. The second group, called 'high symptom presence', included adolescents with scores equal to or above 15 in "symptom presence score" and an interference score lower than 10. In fact, choosing Flament's indication allows us to compare our study with other research in this area. In this study, forty-one subjects (3.9%, 95% CI: 2.73% to 5.07%) showed an interference score of 25 or more (high-interference group). Eight students (0.8%, 95% CI: 0.45% to 1.75%) were included in the high-symptom presence group. They showed a symptom presence score of 15 or more and interference score of 10 or less. Table 3 includes the association between gender and high LOI scores and total scores. Considering the binary classifications for LOI (high interference score and high-symptom presence score), logistic regression adjusted by adolescents' ages did not show any significant

difference between boys and girls, neither in the high interference (p=.13; OR=1.61, 95%CI: 0.85 to3.05) nor in the high-symptom presence groups (p=.56; OR=0.65, CI: 0.15 to 2.75). Nevertheless, multiple regression adjusted by adolescents ages showed that girls scored significantly higher than did boys on both the total- symptom presence score (p=.002; B=0.71, 95%CI: 0.26 to1.16) and interference score (p=.039; B=1.00, 95%CI: 0.05 to1.95).

Table 3. Association between gender and LOI-high scores and total scores

	Percentages (%)			Logistic models adjusted by age			
High scores in LOI-CV	Total	Boys	Girls	OR	p	95% CI (OR)	
Interference>=25	3.9	3.1	4.6	1.61	.13	0.85;	3.05
Symptom presence score >=15 & interference <=10	0.8	0.9	0.6	.65	.56	0.15;	2.75
	Means			Multiple regressions adjusted by age			
Total scores in LOI-CV	Total	Boys	Girls	B	p	95% CI (B)	
LOI- CV: total symptom presence score	8.54	8.16	8.89	.71	.00	0.26;	1.16
LOI-CV: total interference score	8.41	7.94	8.95	1.00	.03	0.05	1.95

Prevalence of LOI symptoms presence and high-interference in both genders

Table 4 includes LOI-CV symptoms and high-interference prevalence in both genders. The most frequent symptoms (more than 60% frequency) among students were fussy about hands, hate dirt and contamination, go over things a lot (repetition), worry about being clean enough, repeated thoughts or words and bad conscience though having done nothing wrong. The most interfering symptoms were worrying about being clean enough, fussy about hands, hating dirt and contamination and going over things a lot (repetition). Four items ('repeated thoughts or words', 'hate dirt and contamination', 'indecisiveness' and 'go over things a lot') were significantly more frequent in females than they were in males, while only one item ('to get angry if someone messes the desk') was more frequent in

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males than it was in females. Males showed significantly higher interference scores than did females on the items 'angry if someone messes desk' and 'spend extra time in checking homework', and females showed significantly more interference on the items 'indecisiveness' and 'bad conscience though having done nothing wrong'.

The association between LOI, CDI and SCARED

Table 5 includes the association between LOI-CV, CDI, and SCARED. Linear regressions adjusted by adolescents' gender, age and SCARED total score showed that the association between the LOI interference score and the LOI total-symptom presence score and the Children´s Depression Inventory(CDI) was significant and positive. As summarized in Table 5, participants with the highest scores in the depression scale were also those with the highest scores in LOI.

However, after adjusting for a subject's gender, age and CDI total score, linear regressions did not show any significant association between the LOI total interference score and SCARED, neither for total score, nor for any of the SCARED subscales. The same result was found for the association between the LOI total-symptom presence score and SCARED total and its five subscales.

Table 4. The percentage of LOI-CV "symptom presence score" and "high interference" (interference score =3) in 1061 adolescents

LOI Items	Symptom presence score (symptom prevalence)						High interference score (interference score = 3)					
	Prevalence (%)			Logistic regression			Prevalence (%)			Logistic regression		
	Total	Boys	Girls	OR	95% CI (OR)		Total	Boys	Girls	OR	95% CI (OR)	
1. Do certain things(have to)	23	24	22	.85	0.61	1.19	1.53	1.27	1.81	1.91	0.54	6.66
2. Repeated thoughts or words	60	54	67	1.48*	1.10	1.97	5.25	3.62	7.06	1.22	0.64	2.32
3. Check several times(have to)	56	54	59	1.09	0.82	1.44	4.38	3.61	5.23	1.92	0.92	3.96
4. Hate dirt and contamination	76	71	81	1.77*	1.28	2.44	9.81	8.48	11.29	1.39	0.86	2.24
5.Something touched is spoiled	10	11	9	.95	0.61	1.48	0.57	0.72	0.40	.43	0.04	4.18
6.Indecisive(a frequent problem)	57	49	66	1.87*	1.40	2.48	7.16	4.15	10.53	2.61*	1.50	4.54
7. Worry about clean enough	61	61	61	.84	0.64	1.11	10.90	10.67	11.16	.75	0.47	1.20
8. Fussy about hands	79	77	81	1.0	0.73	1.45	10.22	9.42	11.11	1.18	0.72	1.92
9 .At night put thing away just right	30	28	33	1.29	0.95	1.73	4.58	4.16	5.04	1.05	0.53	2.04
10. Angry if someone mess desk	43	48	37	.50*	0.38	0.67	4.30	5.63	2.82	.34*	0.16	0.71
11. Spend extra time in checking homework	24	26	23	.75	0.54	1.04	1.62	2.17	1.01	.24*	0.07	0.76
12. Repetition until correct	45	42	48	1.11	0.83	1.47	3.44	2.89	4.04	1.54	0.70	3.35
13. Need to count several times	16	16	17	.95	0.65	1.38	1.24	1.62	0.80	.47	0.11	1.92
14. Trouble finishing school Works	28	28	27	.75	0.55	1.02	2.86	3.07	2.62	.56	0.24	1.33
15. Favorite or special number	19	20	18	.92	0.64	1.33	2.67	2.89	2.41	.52	0.21	1.29
16.Bad conscience though done nothing wrong	60	54	67	1.32	0.98	1.75	5.64	3.27	8.28	2.34*	1.22	4.49
17.Doing things in exact manner	55	54	57	.93	0.71	1.24	6.58	5.60	7.68	1.14	0.62	2.06
18.go over things a lot (repetition)	68	62	75	1.48*	1.08	2.01	7.44	4.87	10.30	1.70	0.97	2.97
19. Talk or move to avoid bad luck	21	21	21	.80	0.55	1.16	2.00	1.81	2.21	1.40	0.48	4.04
20. Special number or words to avoid	18	18	18	1.09	0.73	1.61	2.38	2.53	2.22	.70	0.27	1.84

OR coefficients adjusted by subject's age. *Significant OR (.05 level).

Table 5. Association between LOI-CV, CDI and SCARED total and its five subscales

Multiple regression adjusted by gender, age and SCARED score	B	*P*	95% CI (B)	
CDI total*LOI total interference	.26	.00	0.17	0.34
CDI total *LOI total yes score	.06	.00	0.02	0.10
Multiple regression adjusted by gender, age and CDI total score	B	*P*	95% CI (B)	
SCARED generalized anxiety*LOI total interference	.64	.72	-2.96	4.25
SCARED panic *LOI total interference	.55	.76	-3.03	4.14
SCARED separation anxiety*LOI total interference	.71	.69	-2.89	4.31
SCARED social phobia *LOI total interference	.09	.96	-3.51	3.69
SCARED school phobia *LOI total interference	.29	.87	-3.33	3.91
SCARED total *LOI total interference	-.18	.91	-3.78	3.40
SCARED generalized anxiety*LOI total yes score	.75	.38	-0.95	2.46
SCARED panic*LOI total yes score	.47	.58	-1.22	2.18
SCARED separation anxiety*LOI total yes score	.61	.48	-1.09	2.32
SCARED social phobia *LOI total yes score	.45	.60	-1.26	2.15
SCARED school phobia *LOI total yes score	.42	.62	-1.29	2.14
SCARED total*LOI total yes score	-.39	.65	-2.09	1.31

Logistic regression adjusted by adolescents' gender, age and CDI total.

4.4. Discussion

Following the indication of Flament et al. (1988) and Berg, Whitaker, Davies, Flament, &

Rapoport (1988), the interference score of LOI-CV represents the best indicator of

obsessive-compulsive psychopathology. They suggest that the symptom -presence score

reflects a normal concern and general worries among adolescents, but items with high

interference may be more clinically predictive and may reflect the proportion of adolescents

with subclinical and clinical OCD. In our study, about 3.9% of the population showed a

significant interference of obsessive symptomatology in daily activities. This percentage is

comparable to what is reported by Thomsen (1993) in Denmark and Maggini et al. (2001)

in Italy (Table 6). Our finding is about twice more than what was found by Flament et al.

(1988). These discrepancies might reflect differences between European countries and The

United States of America (USA), although there seem to be no dissimilarities in the prevalence of OCD in the general population between the USA and Europe (Rasmussen & Eisen, 1992). The dissimilarity that can be seen between our study and the Polish study can be related to differences between Eastern and Western European nations in anxiety and depression symptoms (Boyd, Gullone, Kostanski, Ollendick, & Shek, 2000), as adolescents from countries such as Bulgaria, Poland and Russia report higher levels of anxiety and depression symptoms.

In the present study, the rate of the high-symptom presence score was 0.8%, which is comparable with the findings of Flament et al. (1988) and the Polish study but lower than findings in Italy and Denmark. This discrepancy can refer to a different strategy of applying the same questionnaire. Like Flament's study and the study done in Poland, our questionnaires were not done confidentially because in our study, LOI was used as a screening instrument. On the other hand, a high-symptom presence score is the sign of ego-syntonic OCD and can be considered as a sign of obsessive personality disorder (OCPD) or more severe and nearly psychotic OCD (Insel & Akiskal, 1986). Hence, the low prevalence of a high-symptom presence score in a community sample seems reasonable.

Table 6 includes the comparison between the high-symptom presence score and interference score among studies in which the LOI-CV was applied to adolescent population.

Table 6. Comparison of high symptom presence score and high interference score using LOI-CV on adolescents

Authors (years)	Sample	Mean age (range)	Country	High interference	High symptom presence
Flament et al. (1988)	5,108	16.2 (14-17)	USA	1.6%	0.7%
Thomsen (1993)	1,032	13.8(11-17)	Denmark	4.1%	1.4%
Maggini et al.(2001)	2,991	17.4(16-21)	Italia	4.1%	3.0%
Brynska &Wolanczyka (2005)	2,884	13.5 (13-14)	Poland	5.5%	0.9%
Present study(2011)	1,061	13.9 (13-17)	Spain	3.9%	0.8%
Canals et al.(2012)	1,514	10.23(8-12)	Spain	4.7%	-----

In this study, the most frequently reported symptoms (a frequency of more than 60%) were concerns of contamination (fussy about hands, hate dirt and contamination, worry about being clean enough), repetition (go over things a lot, repeated thought or word) and bad conscience though having done nothing wrong. This outcome was expected because the obsessive-compulsive phenomenon related to the dirt phobia is widely reported in different studies and is culturally accepted (Okasha et al., 2001; Roussos et al., 2003;Bryńska & Wolańczyk, 2005; Flament et al., 1988; Maggini et al., 2001; Thomsen, 1993). In addition, repetitions that can reflect a lack of sureness or doubt are a characteristic of adolescents and have been widely reported across studies exploring childhood OCD (Bryńska & Wolańczyk, 2005; Roussos et al., 2003).

The most interfering items in this study were concerns of contamination ('fussy about hands', 'hate dirt and contamination', 'worry about being clean enough') and repetition ('go over things a lot'). Although almost 10% of adolescents in our study suffered from dirt phobias, which have high interference with daily life, these behaviors can only be diagnosed as pathological on the basis of the time they consume, their intensity and impact

upon functioning and the distress they cause. Such clarification can only be achieved through interview, while LOI-CV identifies only the interference aspect.

In this study, females showed significantly more symptoms and higher interference scores than did males. This finding can reflect sex stereotypes or a higher level of anxiety in girls(Peer M. Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998).This finding can also be compared with those of Berg et al. (1988) , Maggini et al. (2001) and Brynska & Wolańczyk (2005), while it is in contrast with the findings in the Danish population, in which no difference was found in the symptom presence score and interference score between gender groups. A very different finding was reported by ZhanJiang, BingWu, & JiSheng (2003) who studied 3,185 Chinese students. They found no gender-based difference in the total- symptom presence score, but rather a predominance of males in the total interference score. In a study of 2,552 Greek adolescents (Roussos et al., 2003), females reported more symptoms in LOI-CV. However, in the interference score, boys tended to score higher than did girls, generally, in items related to worrying about cleanliness and a lack of control. In the present study, females significantly showed four symptoms more than did males: 'repeated thoughts or words', 'hate dirt and contamination', 'indecisiveness' and 'go over things a lot', while the only item that was more frequent in males was to get angry if someone messes the desk.

In the interference score, males showed significantly higher rates than did females in two items: 'spend extra time in checking homework' and 'angry if someone messes desk'. Interestingly, among Italian and Greek boys Item 9 (angry if someone messes desk) was reported as an item with higher interference. This can reflect the need of boys to have

control over their possessions, including their desk. Item 11 (checking homework several times) is also rated as being more interfering among boys. According to Roussos et al. (2003), this item can be considered more distressing rather than interfering among boys. They believe that adolescents tend to rate interference on the basis of the level of distress and embarrassment that the symptom causes rather than on the interference itself. However, in our study, just 26% of boys, as compared to 25% of girls, showed this symptom, and for boys checking homework can be a more distressing responsibility.

In this study, two items were more interfering among females, when compared with males: 'a bad conscience though having done nothing wrong' and 'indecisiveness'. This finding can refer to a high level of anxiety among girls.

At least nine items on LOI-CV were expressed by 50% or more of the participants. More than 70% of respondents showed Items 4 ('hate dirt and contamination') and 8 ('fussy about hands').

In my study, there was a tendency toward a higher interference score for symptoms with higher prevalence. In six items out of nine with prevalence of more than 50%, the interference score was also high. The majority of participants in this study showed multiple obsessional symptoms, many more than would be expected, given the population prevalence of OCD. This finding can be related to the methodological bias (questionnaire) or to the fact that intrusive thoughts commonly occur in 77%-85% of children in non-clinical samples (Allsopp & Williams, 1996; Crye, Laskey, & Cartwright-Hatton, 2010). Alternatively, it has been suggested that some obsessional symptoms may be developmentally appropriate and may dissipate with age (Evans et al., 1997; Berg et al.,

1988). Our findings support this idea because, although most subjects showed multiple obsessional symptoms, only 3.9% met cut-off criteria for probable OCD. This suggests that even if obsessiveness and OCD form a single continuum, not all types of obsessiveness are associated with OCD. Moreover, there may also be qualitative factors that predispose some individuals to OCD but not others.

Hypothetically, it is difficult to find a true cause for the etiology of OCD. Possible suspected causal influences reported for OCD include birth abnormalities, intelligence, heritability, parental mental health, socio-economic status and an abnormally high anxiety response to intrusive thoughts(Douglass et al., 1995). Nevertheless, recent studies emphasize more on additive genetic effects and non-shared environmental factors(Taylor, 2011). Keeping in mind that symptom patterns alone are unlikely to be sufficient predictors of clinically significant psychiatric illness, further assessment of impairment and distress or other complicating factors is necessary.

The association between OCD symptom and anxiety symptoms severity

After controlling for interfering variables like gender, age, and depression, linear regression did not show any significant correlation between anxiety symptoms severity and obsessive-compulsive behaviors. Thus, it can be concluded that people with OCD symptoms did not show more anxiety symptoms like panic, separation anxiety, generalized anxiety, social and school phobias. Although we have only studied obsessive-compulsive symptoms, not disorder, our findings are in line with previous studies like (Ferdinand, Dieleman, Ormel, & Verhulst, 2007), which focused on OCD symptoms. Accordingly, a question that is worth

exploring is whether OCD should be classified as one of the putative obsessive-compulsive related disorders or as one of the anxiety disorders.

The association between OCD symptom and depressive symptom severity

The association between depression and obsessive-compulsive behavior was significant, even after controlling for gender, age and anxiety symptoms severity.

Depressive disorders tend to be the most common comorbid diagnoses in OCD. For example, in the NIMH sample of 70 children, only 18 (26%) had OCD as their only diagnosis, while 35% received a comorbid diagnosis of depression (Swedo et al., 1989). The proportion has been estimated to be almost two-thirds of all cases in some studies (Pediatric OCD Treatment Study (POTS) Team, 2004; Pigott, L'Heureux, Dubbert, Bernstein, & Murphy, 1994). However, a detailed multivariate analysis of a large epidemiological sample suggested the proportion of 17% (Andrews, Slade, & Issakidis, 2002).

The data suggest that there is a strong association between OCD symptom and depressive symptoms severity although future research should examine the temporal order of OCD and depressive symptoms.

5. STUDY 2:THE CONTRIBUTION OF DYSFUNCTIONAL OBSESSIVE BELIEFS IN PREDICTING OCD SYMPTOMS AMONG ADOLESCENTS

5.1. Objectives

I have three objectives in this study. The first objective is to examine the relation between different OCD symptoms and obsessive beliefs. The independence of this relation is studied by controlling for depression and second to examine the contribution of obsessive beliefs, such as inflated responsibility/overestimation of threat (RT), perfectionism/ intolerance for uncertainty (PC), importance of thoughts/ need to control thoughts (ICT) and thought action fusion (TAF) in predicting OCD symptoms among adolescents.

5.2. Method

5.2.1. Participants

The sample includes 966 students, 460 (47.6%) girls, and 506 (52.4%) boys. The age of the participants ranged between 13 to 16 years old, with a mean age of 13.89 years (SD = 0.074)

5.2.2. Instruments

1. *Leyton Obsessional Inventory –Child Version* (LOI-CV; Berg, Rapoport & Flament, 1986). This is a 20-item self-report questionnaire for assessing the presence of obsessive preoccupations and behaviors (yes score) and rating the interference of each behavior (interference score) in personal functioning. In this study, we relied on factor analysis of Canals et al. (2011) on LOI-CV. On their study on Spanish population, they obtained three factors that explained 46.30% of the variance. These factors were labeled

Order/Checking/Pollution (OCP), Obsessive Concern (OC), and Superstition/ Mental Compulsion (SMC) (30.15%, 8.53% and 7.62% of the variance, respectively).

2. *Screen for Child Anxiety Related Emotional Disorders* (SCARED; Birmaher, Khetarpal & Cully, 1997). This questionnaire assesses anxiety disorder symptoms in children and adolescents. It consists of 41 items that assess anxiety disorder symptoms according to DSM-IV criteria. In this study, we will just use the SCARED-total score in analyzing data.

3. *Children's Depression Inventory* (CDI; Kovacs, 1992). This questionnaire assesses the severity of depressive symptoms in 7 to 17 year-old children and adolescents. It includes 27 items in which the scores ranged between zero and two.

4. *Obsessive Beliefs Questionnaire (OBQ-44; OCCWG, 2005).* This is a 44-item measure assessing a range of belief domains that have been proposed as important in the etiology of OCD. This questionnaire has three factors: 1) Responsibility/Threat estimation subscale (RT) which includes 16 items ; 2) Perfectionism/Certainty subscale (PC) which is comprised of 16 items; and 3) Importance/Control of thoughts subscale (ICT) which includes 12 items. Participants rate how much they agree with different beliefs on a 5-point Likert scale, ranging from 0 (disagree very much) to 4 (agree very much).

5. *Thought-Action Fusion Questionnaire for Adolescents (TAFQ-A; Muris et al., 2001).*This measure consists of 15 brief vignettes that follow by an item. Eight of the items refer to the fusion of thoughts and action in terms of morality and seven items pertain to the fusion of thoughts and action in terms of Likelihood. Each item had to be rated on a four- point Likert scale from 0 = "not at all true" to 3 = "very true". In our

study, we adopted the validated version of TAF-A among Spanish adolescents by
Fernández-Llebrés, Godoy, & Gavino (2010). Please see the methodology section for
more information about psychometric properties of all of the instruments.

5.3. Results

Internal consistency and descriptive statistics

Table 7 shows means, standard deviations and internal consistency coefficients
(Cronbach's alpha) for subscales of LOI-CV, OBQ-44, TAF-A CDI, and SCARED total
scores. All of the measurements demonstrated good internal consistency. In LOI-CV, total
scores of each of the subscales showed the best reliabilities (in the three factors, 0.77, 0.80
and 0.78 respectively), as it takes into account both the presence of OCD symptoms (yes
score) and the interference of these symptoms. In OBQ, the alpha coefficient for all three
subscales was between 0.83 and 0.87. TAF moral and likelihood also showed alpha
coefficients of 0.86 and 0.87. CDI-total and SCARED-total also showed good internal
consistency (0.83 and 0.84, respectively).

Table 7. Descriptive statistic and Alpha coefficients

	Mean	SD	Alpha
OBQ-PC	25.87	11.29	.87
OBQ-ICT	13.17	8.34	.83
OBQ-RT	25.34	11.13	.86
TAF-Moral	5.11	4.97	.86
TAF- likelihood	3.02	4.09	.87
LOI-OCP	3.72	1.66	.77
LOI-OC	3.72	1.83	.80
LOI-SMC	1.06	1.36	.78
CDI- total	11.25	6.28	.83
Scared- total	22.95	8.81	.84

Note.LOI =Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT =importance/ control of thoughts, TAF- likelihood =Thought Action Fusion-

likelihood, TAF-Moral =Thought Action Fusion -Moral, CDI= Child Depression Inventory, SCARED= Screen for Child Anxiety Related Disorder

5.3.1. Bivariate Pearson correlation

Table 8 shows the Bivariate Pearson correlations between each of lOI-CV subscales, TAF

subscales, OBQ subscales, CDI-total, and SCARED-total. As can be seen, all three of the

LOI-CV subscales had a significant association with each of the three OBQ subscales

Table 8. Pearson correlation between LOI-CV, OBQ-44, TAF subscales, CDI, and SCARED total scores

	1	2	3	4	5	6	7	8	9	10
1. SCARED-total	1	.264**	.479**	.318**	.215**	.139**	.240**	.279**	.158**	.580**
2.LOI-OCP		1	.438**	.316**	.117**	.122**	.173**	.265**	.161**	.074*
3.LOI-OC			1	.386**	.212**	.150**	.296**	.352**	.203**	.397**
4.LOI-SMC				1	.306**	.155**	.204**	.242**	.195**	.281**
5.TAF-likelihood					1	.516**	.379**	.375**	.413**	.250**
6.TAF-Moral						1	.394**	.315**	.479**	.095**
7.OBQ-RT							1	.699**	.668**	.227**
8.OBQ-PC								1	.578**	.252**
9.OBQ-ICT									1	.179**
10.CDI-total										1

Note.LOI =Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT =importance/ control of thoughts, TAF- likelihood =Thought Action Fusion- likelihood, TAF-Moral =Thought Action Fusion- Moral, CDI= Child Depression Inventory, SCARED= Screen for Child Anxiety Related Disorder ,**p<0.01,* p<0.05

5.3.2. Partial correlations

To examine the independence of the relationships between the theoretical variables and OCD symptoms, we computed a series of partial correlations in which OBQ and TAF subscales were used to predict OCD symptoms while controlling for CDI total score. Table 9 displays the results, which indicate that even after controlling for CDI total score, the OBQ and TAF subscales still significantly predict OCD symptoms. Moreover, controlling for CDI total score resulted in a reduction in the magnitude of the Pearson correlations among these variables.

Table 9. Partial correlation between theoretical variables and OCD symptoms

Theoretical variables	OCD symptoms (LOI subscales)	Controlling for	Partial correlation
OBQ-RT	LOI-OC	CDI-total	.241**
OBQ-RT	LOI-SMC	CDI-total	.156**
OBQ-RT	LOI- OCP	CDI-total	.168**
OBQ-PC	LOI-OC	CDI-total	.280**
OBQ-PC	LOI-SMC	CDI-total	.197**
OBQ-PC	LOI-OCP	CDI-total	.254**
OBQ-ICT	LOI-SMC	CDI-total	.161**
OBQ-ICT	LOI-OCP	CDI-total	.148**
OBQ-ICT	LOI-OC	CDI-total	.145**
TAF-likelihood	LOI-SMC	CDI-total	.269**
TAF-likelihood	LOI-OCP	CDI-total	.112**
TAF-likelihood	LOI-OC	CDI-total	.120**
TAF-Moral	LOI-OCP	CDI-total	.107**
TAF-Moral	LOI-OC	CDI-total	.123**
TAF-Moral	LOI-SMC	CDI-total	.140**

Note.LOI= Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT= importance/ control of thoughts, TAF- likelihood=Thought Action Fusion-likelihood, TAF-Moral= Thought Action Fusion- Moral, CDI= Child Depression Inventory, SCARED= Screen for child anxiety related disorder, ** $p<0.01$,* $p<0.05$

5.3.3. Regression analysis

To determine whether any of the OBQ subscales uniquely predicted OC symptoms, we fitted linear regressions for predicting the three LOI subscales from three OBQ subscales in

all of the participants. The results of the regression analyses predicting each LOI-CV

subscale are summarized in the final step of each regression equation of Table 4.

LOI-Ordering/checking/pollution

The final model accounted for a significant proportion of the variance in LOI-

Ordering/checking and pollution subscale scores ($R^{2\ adj.} = .120$), with SCARED total, OBQ-

PC and CDI-total as significant predictors.

LOI- Obsessive concern

The final model accounted for a significant proportion of the variance in LOI-obsessing

concern subscale scores ($R^{2adj.} = .301$), with SCARED-total, OBQ-PC and CDI-total as

significant predictors.

LOI -Superstition and mental compulsion

The final model accounted for a significant proportion of the variance in LOI-superstition

and mental compulsion subscale scores ($R^{2adj.} = .185$) with TAF-likelihood, SCARED-total,

OBQ-PC and CDI-total being significant predictors.

Table 10. Summary of the statistics for the final step of regression equations predicting LOI-CV subscales in all of participants

Criterion (Adj. R^2)	Predictors	B (IC95%)	β	P	F (p)
Predicting LOI-OC (.301)					127.274 (<.001)
	SCARED-total	0.069 (.055; .084)	.332	<.001	
	OBQ-PC	0.035 (.026; .045)	.217	<.001	
	CDI-total	0.047 (.028; .067)	.163	<.001	
Predicting LOI-OCP(.120)					40.964(<.001)
	SCARED-total	0.054(.039; .068)	.285	<.001	
	OBQ-PC	0.033(.023; .042)	.221	<.001	
	CDI-total	-0.036(-.056; -,016)	-.138	<.001	
Predicting LOI-SMC(.185)					50.870(<.001)
	TAF-likelihood	0.074(.052; .096)	.222	<.001	
	SCARED-total	0.030(.018; .041)	.192	<.001	
	OBQ-PC	0.011(.003; .019)	.094	.005	
	CDI-total	0.022(.006; .038)	.104	.006	

Note.LOI= Leyton Obsessional Inventory, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT= importance/ control of thoughts, TAF- likelihood= Thought Action Fusion_ likelihood, TAF-Moral= Thought Action Fusion- Moral, CDI= Child Depression Inventory, SCARED= Screen for child anxiety related disorder

5.4. Discussion

According to the cognitive– behavioral OCD model (Rachman, 1997; Salkovskis, 1996) and Consistent with our hypotheses and with previous research (OCCWG, 2005; Tolin, et al., 2008; Tolin, et al., 2003; Viar, et al., 2011), obsessive beliefs were significantly associated with all of OCD symptoms measured by LOI-CV.

To examine the independence of associations between obsessive beliefs and OCD symptoms, we performed partial correlation analyses. Controlling for CDI total score reduced the magnitude of the Pearson correlations between these variables, and all of the correlations remained significant. The correlations between LOI-OC and OBQ-PC remained the strongest relations. In addition, LOI-SMC showed its strongest correlation with TAF-likelihood.

We have performed regression analyses without controlling for general distress (depression and anxiety). According to Taylor, et al. (2010), controlling for distress could produce an incorrect underestimation of the predictive power of the OBQ. If obsessive beliefs lead to OCD symptoms, and OCD symptoms then contribute to general distress, in these circumstances, the beliefs, as assessed by the OBQ, indirectly contribute to general distress. If this is the case, then taking out distress from OCD symptom scores is equal to taking out some of the effects of the OBQ on OCD symptoms. Our regression analysis revealed that perfectionism and intolerance of uncertainty (IU) accompanies depression and anxiety symptoms predicting all of the LOI-CV subscales. Superstitions and mental compulsion symptom is also predicted by TAF- likelihood.

IU is defined as a cognitive bias that affects how a person perceives, interprets, and responds to uncertain situations by excessive worry and avoidance (Freeston, Rhéaume, Letarte, Dugas & Ladouceur, 1994). Such a person might believe that being uncertain about the future is unfair. IU plays a central role in the development and maintenance of excessive and uncontrollable worry (Laugesen, Dugas& Bukowski, 2003). In our study, among all of obsessive beliefs, OBQ-PC has the strongest correlation with SCARED total. Perfectionism as introduced by Hamachek (1978) includes two ends of the continuum: normal and neurotic. Neurotic perfectionists are characterized as having high levels of anxiety and a strong fear of failure. These people are unable to gain pleasure from their efforts because they are often unsatisfied with their accomplishment level. According to OCCWG, the cognitive process of perfectionism goes hand in hand with IU in OCD. It is because pursuing perfectionism is often due to the need to increase certainty about future outcomes that are experienced as uncertain and distressing (OCCWG, 1997). The latest finding (Reuther et al., 2013) confirms that the relation between perfectionism and OCD symptoms is completely mediating by IU.

In the present study, obsessive concern was predicted by perfectionism and intolerance of uncertainty beliefs. Obsessive concern in LOI does not measure any sexual or aggressive obsessions. It focuses more on indecisiveness, repeating thoughts and words, going over things several times, and troubles in finishing school works. As the mean age of our participants is around 13 years old, it seems reasonable that high perfectionism can predict indecisiveness and going over things a lot.

Mental compulsion and superstition beliefs were predicted by TAF-likelihood that indicates that merely thinking about an event may increase its probability. Thus, for preventing unpleasant events, the person may rely on some words, numbers, or other form of mental compulsions (e.g., repeating and counting mentally) to keep bad luck away. Assuming the similarity between mental compulsion and neutralizing behavior, our result seems comparable Tolin et al. (2003) study.

OBQ-ICT covers some aspects of TAF likelihood concept (importance of thoughts). In our study, LOI-SMC is predicted by TAF-likelihood. Therefore, one might expect that LOI-SMC be also predicted by OBQ-ICT. However, in our study, we observed that LOI-SMC is not predicted by OBQ-ICT. This can be because the superstitious beliefs relate more to the importance given to the thoughts, rather than to the strategies uses to control them.

Ordering, checking, and contamination were predicted by perfectionism and intolerance of uncertainty. As three different OCD symptoms (Ordering/checking and contamination) loaded on the same factor, comparing our results to other studies is difficult. In general, our result is in the line with previous studies (Julien et al., 2008; Myers et al., 2008; OCCWG, 2005).Recently Fitch & Cougle, (2013) in vivo assessment of obsessive compulsive symptoms to predict obsessive beliefs find that all of these three obsessive symptoms (ordering, checking and contamination fear) are predicting by perfectionism and intolerance of uncertainty beliefs.

In this study, dysfunctional beliefs were strongly correlated with each other, ranging from 0.57 to 0.69. This is consistent with previous findings indicating a strong relationship between obsessive beliefs (OCCWG, 2005; Taylor et al., 2010). There are several possible

reasons for such high correlations. One possibility that has been previously suggested is that these beliefs are correlated as they mutually influence each other (Frost & Steketee, 2002). Obsessive beliefs, in addition to putative direct effects on OCD symptoms, are also said to have indirect effects, that is, beliefs interact with each other to influence OCD symptoms. For example, a highly elevated sense of personal responsibility might strengthen beliefs about the need to act perfectly, and might reinforce beliefs about the importance of controlling one's unwanted thoughts (Frost & Steketee, 2002).

6. STUDY 3: DO COGNITIVE BELIEFS PLAY A ROLE IN ANXIETY DISORDERS ? THE CONTRIBUTION OF OBSESSIVE BELIEFS IN GAD, SOCIAL PHOBIA AND DEPRESSION

6.1. Objectives

1. To investigate whether OCD participants endorse obsessive beliefs such as inflated responsibility and overestimation of threat (RT), perfectionism and intolerance of uncertainty (PC), over importance and need to control of thoughts (ICT) and thought-action fusion (TAF) more strongly than participants with generalized anxiety disorder (GAD), social phobia (FS), and major depression and/or distimia (MDD/distimia) or not.

2. To study the relation between obsessive beliefs and OCD, depression and anxiety symptoms in all of the participants to see if there is a significant correlation between obsessive beliefs and OCD, depression and anxiety symptoms.

3. To see if there is a significant correlation between obsessive beliefs and OCD symptoms in different diagnostic groups

6.2. Method

6.2.1. Instruments

1. Anxiety Disorders Interview Schedule for DSM-IV; child version (ADIS-C; Silverman & Albano, 1996). The ADIS is a semi structured interview that assesses the DSM-IV anxiety, mood, and externalizing disorders experienced by school age children and adolescents. A point of 4 or higher in Clinician Severity Rating (CSR) was required to meet criteria for each DSM-IV diagnosis.

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2. *Obsessive Beliefs Questionnaire (OBQ-44; OCCWG, 2005).* This is a 44-item measure assessing a range of beliefs that have been proposed as important factors in the etiology of OCD. This questionnaire has three factors: (1) responsibility/threat estimation subscale (RT) which includes 16 items; (2) perfectionism/certainty subscale (PC) which has 16 items; (3) importance/control of thoughts subscale (ICT) which includes 12 items. Participants rate to what extent they agree with different beliefs on a 5-point Likert scale, ranging from 0 (disagree very much) to 4 (agree very much).

3. *Thought-Action Fusion Questionnaire for Adolescents (TAFQ-A; Muris et al., 2001).* This measure consists of 15 brief vignettes that each is followed by an item. Eight of the items refer to the fusion of thoughts and actions in terms of morality and seven items pertain to the fusion of thoughts and actions in terms of likelihood. Each item had to be rated on a four- point Likert scale from 0 = "not at all true" to 3 = "very true". In the current study, I adopted the validated version of TAF-A among Spanish adolescents by Fernández-Llebrés, Godoy & Gavino (2010).

4. *Leyton Obsessional Inventory –Child Version* (LOI-CV; Berg, Rapoport & Flament, 1986). This is a 20-item self-report questionnaire for assessing the presence of obsessive preoccupations and behaviors (yes score) and rating the interference of each behavior (interference score) in personal functioning. In this study, I relied on factor analysis of Canals et al. (2011) on LOI-CV.

5. *Children's Depression Inventory* (CDI; Kovacs, 1992). This questionnaire assesses the severity of depressive symptoms in 7 to 17 years old children and adolescents. It includes 27 items in which the scores ranged between zero and two.

6. Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher, Khetarpal & Cully, 1997). This questionnaire assesses anxiety disorder symptoms in children and adolescents. It consists of 41 items that assess anxiety disorder symptoms according to DSM-IV criteria. In this study, I only use the SCARED-total score in analyzing data. Please see methodology section for more information about psychometric properties of all of the instruments.

6.2.2. Participants

We conducted interview on 654 adolescents from which, I selected 16 adolescents with OCD diagnosis, 64 adolescents with FS diagnosis, 52 adolescents with GAD, and 47 adolescents with MDD/distimia diagnosis. I chose 50 non-clinical adolescents as a group of control. More information about the description of each diagnostic group is in methodology part.

6.3. Results

6.3.1. Obsessive beliefs

Are obsessive beliefs measured by OBQ specific to OCD?

The ANOVA analysis (Table11) revealed that there is significant differences on the subscale of OBQ-PC between different groups, $F_{(4,211)} = 2.81$, $p < 0.05$. The post-hoc test (Bonferroni correction) revealed that GAD group scored significantly higher than non-clinical control group on OBQ-PC subscale. ANOVA did not show any significant difference between OBQ-ICT and OBQ-RT in different diagnostic groups.

Are TAF beliefs specific to OCD?

The ANOVA analyses (Table 11) did not show any significant difference between different groups in terms of TAF-likelihood and TAF-Moral.

6.3.2. OCD, depression and anxiety symptoms

Do different diagnostic groups differ on LOI-total, SCARED- total and CDI-total?

As seen in Table 11, one-way ANOVA of the LOI total scores shows that there is some significant difference among groups, $F(4,223) = 4.44$, $p < 0.01$. Post-hoc test (Bonferroni correction) showed that OCD participants had higher LOI total scores, compared with the non-clinical and MDD groups, but not the GAD and FS groups. GAD participants also scored higher than non- clinical control group.

As presented in Table 11, one-way ANOVA of the SCARED total scores showed significant group differences, $F(4,223) = 7.93$, $p < 0.001$. Post-hoc test (Bonferroni correction) indicated that OCD, GAD, FS and MDD participants had higher SCARED total scores than non-clinical control group.

As seen in Table 11, one-way ANOVA of the CDI total scores also showed significant group differences $F(4,223) = 10,29$, $p < 0.001$. Post-hoc test (Bonferroni correction) unraveled that all of the OCD, GAD, MDD and FS participants had higher CDI total scores than non-clinical group. MDD participants also scored higher than FS participants.

Table 11. Comparing different theoretical variables in different diagnostic groups

Variables	OCD (N=16) Mean(SD)	GAD(N=52) Mean(SD)	FS(N=64) Mean(SD)	MDD/distimia (N=47) Mean(SD)	NCC(N=50) Mean(SD)	F	Contrast[a]
OBQ-RT	29,50(8,11)	30,35(10,88)	27,59(9,49)	30,06(12,49)	25,38(11,51)	1,74	NS
OBQ-PC	31.93(7.67)	32.61(10.63)	30.50(11.26)	30.02(12.92)	25.52(9.94)	2,81*	GAD>NCC
OBQ-ICT	16,00(7,76)	15.01(9.11)	14,74(7,83)	15,83(10.80)	13,30(8,07)	0,58	NS
OBQ-total	79,35(20,83)	77,93(25,68)	72,69(22,84)	76,10(33,13)	64,45(25,30)	2,051	NS
TAF-Likelihood	4,43(4,64)	4,52(4,92)	3,85(4,54)	3,68(4,89)	2,90(3,99)	0,88	NS
TAF-Moral	6,18(5,43)	5,98(4,70)	5,80(4,82)	6,30(5,08)	4,98(4,80)	0,51	NS
SCARED-total	30,87(10,60)	30,05(9,15)	29,03(7,59)	29,12(8,73)	22,04(7,51)	7,93***	GAD,MDD,FS,OCD>NCC
CDI-total	17,81(7,03)	15,75(6,70)	13,76(5,79)	17,25(6,90)	9,98(5,92)	10,29***	GAD,OCD,MDD,FS>NCC MDD>FS
LOI-total	28,50(13,35)	23,69(10,64)	22,30(11,80)	19,48(10,71)	17,28(9,72)	4,44**	GAD,OCD>NCC OCD>MDD

Note.LOI =Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT =importance/ control of thoughts, TAF- likelihood =Thought Action Fusion- likelihood, TAF-Moral =Thought Action Fusion -Moral, CDI= Child Depression Inventory, SCARED= Screen for Child Anxiety Related Disorder, GAD=Generalized anxiety disorder, FS=Social phobia disorder, MDD/Distimia=Major depression and distimia disorder, NCC=Non-clinical control
[a]Bonferroni correction, *p<0.05, **p<0.01, ***p<0.001

6.3.3. Obsessive beliefs, OCD, depression and anxiety symptoms

Do obsessive beliefs correlate with depression and anxiety symptoms as well?

Bivariate correlations (Table12) revealed that all obsessive beliefs are significantly correlated with depression, anxiety and OCD symptoms, excepting to OBQ-ICT and SCARED- total and TAF-moral that showed significant correlation only with OCD symptoms but not with depression and anxiety. Moreover as expected, obsessive beliefs correlated stronger with OCD symptoms (LOI-total) than depression and anxiety symptoms (SCARED and CDI total).

Do obsessive beliefs correlate significantly with OCD symptoms in OCD, GAD, FS, MDD/distimia groups?

Based on Bivariate correlations (Table13), I observed that in OCD group, LOI has a significant correlation with OBQ-PC, ICT and total; in GAD group, LOI has a significant correlation with OBQ-PC, RT and total; in FS, LOI had a significant correlation with OBQ-PC and TAF-Likelihood.MDD did not show significant correlation with any of obsessive beliefs. However, in non clinical control group, we can see significant correlation between LOI and OBQ-RT and total and TAF-likelihood.

Table 12. Pearson correlation between LOI-CV, OBQ-44, TAF subscales, CDI, and SCARED total scores (N=229)

	1	2	3	4	5	6	7	8	9
1. OBQ-PC	1	0,691**	0,500**	0,874**	0,300**	0,221**	0,200**	0,219**	0,270**
2.OBQ-RT		1	0,539**	0,891**	0,318**	0,269**	0,215**	0,194**	0,250**
3.OBQ-ICT			1	0,775**	0,373**	0,402**	0,183**	0,115	0,214**
4. OBQ-total				1	0,399**	0,333**	0,245**	0,209**	0,289**
5. TAF-likelihood					1	0,508**	0,155*	0,169*	0,238**
6. TAF-Moral						1	0,068	0,090	0,213**
7.CDI-total							1	0,542**	0,326**
8.SCARED-total								1	0,398**
9.LOI-total									1

Note.LOI =Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT =importance/ control of thoughts, TAF- likelihood =Thought Action Fusion- likelihood, TAF-Moral =Thought Action Fusion -Moral, CDI= Child Depression Inventory, SCARED= Screen for Child Anxiety Related Disorder
*$p<0.05$, **$p<0.01$, ***$p<0.001$*

Table 13. Pearson correlation between LOI and obsessive beliefs in different diagnostic groups

	LOI-CV(total score)				
	OCD (N=16)	GAD (N=52)	FS (N=64)	MDD (N=47)	NCC (N=50)
1.OBQ-PC	0,529**	0,327*	0,313*	0,090	0,201
2.OBQ-RT	0,380	0,335*	0,162	0,032	0,426**
3.OBQ-ICT	0,630**	0,250	0,149	0,041	0,196
4.OBQ-total	0,543**	0,371**	0,252	0,069	0,332*
5.TAF-Likelihood	0,244	0,087	0,414**	-0,019	0,343*
6.TAF-Moral	0,357	0,268	0,149	0,160	0,205

Note.LOI =Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT =importance/ control of thoughts, TAF- likelihood =Thought Action Fusion- likelihood, TAF-Moral =Thought Action Fusion -Moral,GAD=Generalized anxiety disorder, FS=Social phobia disorder, MDD/Distimia=Major depression and distimia disorder, NCC=Non-clinical control.
*$p<0.05$, **$p<0.01$, ***$p<0.001$

6.4. Discussion

The findings of study 3 did not support the specificity criterion. Obsessive beliefs have been hypothesized to be either OCD-specific (endorsed more strongly by people with OCD than by people with anxiety disorders) or OCD-relevant (endorsed equally by people with OCD and anxiety disorders). There are notable inconsistencies about the existence of OCD specific beliefs when OCD patients and anxious control are compared (Belloch et al., 2010). In this study, I could find supports for the OCD relevant hypothesis. There was not any significant difference between different diagnostic groups on any of obsessive beliefs. The only significant differences in obsessive beliefs were between GAD participants and non-clinical control group. GAD participants endorsed perfectionism and intolerance of uncertainty (PC) more strongly than non-clinical control group. Levels of obsessive beliefs did not significantly differ between OCD participants and those with GAD, FS and MDD and/or distimia. They scored almost the same in obsessive beliefs measures.

The lack of evidence for OCD specificity hypothesis in Study 3 raises the possibility that endorsement of obsessive beliefs may be more strongly related to psychopathology, in general, than to OCD per se (Viar et al. 2011). Tolin et al, (2006) could not find any significant difference for the obsessive beliefs between OCD and anxious participants when depression or anxiety were controlled separately and few differences for the obsessive beliefs between OCD and non-clinical participants. He concluded that the difference between different diagnostic groups could be related to the level of depression and anxiety in general. If level of anxiety and depression were comparable between different diagnostic groups, then the difference between participants on obsessive beliefs would not be significant.

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In this study, this justification should be considered with more cautious because although the results did not show any significant difference on anxiety symptoms in different diagnostic groups, the non-clinical control group scored significantly lower than all of diagnostic groups in depression and anxiety symptoms. Therefore, attributing the level of difference in obsessive beliefs to general distress in general is not confirmed in this study.

Another explanation for this finding could be that the OCD participants in my study belong to the OC-low belief group. According to Taylor et al. (2006), this group is approximately normal in their scores on obsessive beliefs. Taylor et al. (2006) argue that different theoretical models apply to different subtypes of OCD and the models that emphasize the role of dysfunctional beliefs might apply only to a subgroup of OCD and to particular symptom presentations. OCD may actually be a set of topographically similar disorders, each characterized by obsessions and compulsions, but arising from different causal mechanisms (Taylor et al., 2006). This possibility is supported by researches that demonstrate the differences in neuroimaging patterns and neuropsychological functioning across identified OCD subtypes (McKay et al., 2004). In my study, I could not check this finding of Taylor et al, (2006) by doing cluster analysis on all of OCD participants according to few number of OCD cases that I had.

Results have not show any significant group differences between on none of TAF subscales. My findings are consistent with other studies that confirms that TAF has been implicated in other psychological disorders such as depression(Abramowitz et al., 2003; Hazlett-Stevens et al., 2002; Shafran, Thordarson, & Rachman, 1996) and anxiety disorders (Hazlett-Stevens et al., 2002) and it cannot discriminate between OCD and participants with depression and anxiety disorder (Abramowitz et al., 2003; Starcevic & Berle, 2006). Accordingly, I would conclude that

the specificity of the TAF–OCD relationship is still unclear. TAF can be conceptualized as general cognitive bias rather than one specific factor in OCD.

In this study, I included participants with major depression or distimia as a comparison group. Belloch et al. (2010) findings suggest that the beliefs hypothetically related to OCD are also endorsed by depressed patients. My results confirm that obsessive beliefs are not just related to anxiety disorders but also can be related to depressive disorders.

Therefore, due to non-specific nature of obsessive beliefs, the etiological significance of such beliefs for OCD is questionable. Non-specific beliefs offer no explanation to why a person might develop OCD while another person develops some other disorder such as another anxiety disorder or a mood disorder (Julien et al., 2008; Taylor et al., 2006).

7. GENERAL DISCUSSION

In this thesis, I examined the prevalence and cognitive etiology of OCD as a severe and disabling psychiatric condition among children and adolescents. In the first study, I focused on the prevalence and distribution of obsessive compulsive behaviors among 1061 Spanish adolescents in Rubi, Barcelona. The results indicated that forty one subjects (3.9%) showed an interference score of 25 or higher in LOI-CV. According to Flament et al. (1988), the interference score of LOI-CV is best indicator of obsessive-compulsive psychopathology. The most prevalent and interfering symptoms among Spanish adolescents were hating dirt and contamination and going over things a lot (repetition).The results of the first study are comparable to what is reported by Thomsen (1993) in Denmark (4.1% in interference score) and Maggini et al. (2001) in Italy (4.1% in interference score), although it is lower than what has been observed by Canals et al in Spain (4.7% in interference score).

In the second and third study, I concentrated on the cognitive etiology of OCD as a well articulated theoretical model for explaining OCD. Cognitive-behavioral model (Rachman, 1998) posits that people with OCD appraise the occurrence and content of their intrusions as being significant, meaningful, and needing to be controlled (OCCWG, 1997; Rachman, 1997; Salkovskis, 1985). In cognitive models of OCD, specific dysfunctional beliefs are supposed to play a role in the negative appraisal of intrusive thoughts (Frost & Steketee, 2002). The dysfunctional obsessive beliefs that are introduced by OCCWG group are threat estimation and inflated responsibility, beliefs about the importance and need to control of thoughts and perfectionism and intolerance of uncertainty. Moreover, in this study we assessed the contribution of thought action fusion beliefs in OCD symptoms.

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Tolin et al. (2006) have observed that a robust relation between OCD symptom and obsessive beliefs would be present if (1) all OCD symptom dimensions are associated with at least some form of obsessive belief (generality), (2) different obsessive beliefs meaningfully relate to different OCD symptom dimensions (congruence), and (3) OCD patients endorse obsessive beliefs more strongly than patients with anxiety disorders.

In the second study, I examined the first and the second criteria of Tolin et al. (2006) in a sample of 966 Spanish adolescents. Correlational analysis provided supportive evidence for the generality requirement such that all OCD symptoms, assessed with LOI-CV, were significantly associated with obsessive beliefs (assessed by OBQ-44 and TAF-A). Regression analysis however did not provide evidence for congruence criteria as we couldn't find evidences that different obsessive beliefs meaningfully relate to different OCD symptom. In this study perfectionism and intolerance of uncertainty beliefs accompanying depression and anxiety symptoms predicted all of the OCD symptoms dimensions. Moreover, TAF- likelihood predicted mental compulsion and superstition symptoms.

In the third study, I assessed the specificity criteria of Tolin et al. (2006) to see if OCD participants endorsed obsessive beliefs more strongly than participants with other psychological disorders. I selected adolescents with OCD, GAD, FS and MDD/distimia diagnosis and compared their scores on OBQ and TAF subscales and other clinical variables like OCD, depression and anxiety. We have selected these three psychopathologies first, because they share considerable cognitive processes with OCD (Especially between GAD and OCD). Second, depression shares conceptual ties to anxiety, including both GAD and OCD, and is markedly

comorbid with both (Mineka, Watson, & Clark, 1998). Its inclusion will allow us to examine if the cognitive processes are shared by symptoms of many disorders (Fergus &Wu, 2010).

Although Analysis of variance (ANOVA) showed significant difference between some diagnostic group in LOI and CDI total scores, the specificity criteria did not confirmed by ANOVA as different diagnostic groups did not show significant differences in terms of obsessive beliefs. This finding is consistent with prior research that has also failed to find significant differences in obsessive beliefs between those with OCD and those with depression or other anxiety disorders (Belloch et al. 2010, Viar et al., 2011). The absence of evidence for OCD specificity suggests that not all the obsessive beliefs play the same role in all the OCD subtypes (Calamari et al., 2006; Taylor et al., 2006; Belloch et al., 2010). The results suggest "the necessity of taking in to account the heterogeneity of OCD when studying associated cognitive phenomena" (Belloch et al., 2010, p.386). This implies that future cognitive therapy studies might benefit from being more distortion specific and less disorder specific because many of the underlying cognitive processes and beliefs are shared between various anxiety disorders (Starcevic & Berle, 2006).

8. STUDY STRENGTHS, LIMITATIONS, AND FUTURE RESEARCH

8.1 Strength of this study

The strength of this study first of all can refer to use of large sample of adolescents. We could find very few studies that examine the association between obsessive beliefs and OCD symptom among non-clinical adolescents. The use of a large sample can provide more accurate estimates (in terms of the explained varience), which in turn can result in more robust findings.

Second, in this study we have not mixed up participants with different anxiety disorders in one group called "Anxiety Control". This may yield more accurate conclusions about the contribution of obsessive beliefs in anxiety disorders. Third, having a good sample of participants with different anxiety disorders is another strength of this research.

8.2 Limitations

This thesis has some limitations; first, the correlational nature of this investigation significantly limits any causal inferences that can be made regarding the role of obsessive beliefs in OCD.

Second, the ascertainment of obsessions and compulsions in community samples is particularly difficult because most participants are not familiar with this rare phenomenon, and normal behaviors could be mistakenly considered as being psychiatric symptoms (Breslau, 1987) and vice versa. As pointed out by Flament et al., (1988), LOI-CV not only yields a few false-negative cases but also can bring about a large number of false-positive cases. For this reason, our results must be interpreted with caution due to the possibility of an overestimation. Nevertheless, in the present study, the risk of pathologically considering some normal cognitions and behaviors was diminished because of the clarifications that the two researchers gave to the participants.

Third, we could not compare some of our results obtained in the second study with previous related studies because of some restrictions related to LOI-CV. The dimensions of LOI-CV, as a widely used questionnaire to assess obsessive-compulsive behavior among adolescents, hardly matches with well-known questionnaires used for assessing OCD symptoms in adults. Moreover, LOI does not assess some symptom dimensions of OCD such as aggressive and sexual obsessions, and harm avoidance.

Forth, another limitation may relate to the use of self-report instruments to evaluate the endorsement of beliefs that have non-conscious nature (McFall & Wollersheim, 1979). However, assessing obsessive beliefs in OCD participants by self-report instruments may have also an additional problem. As Belloch et al, (2010) mentioned, OCD patients report that their dysfunctional beliefs are only activated when experiencing some specific thoughts (their own obsessional thoughts). Therefore, obsessive beliefs assessed by OBQ might be better conceptualized as dysfunctional appraisals that are highly restricted to the specific obsessional contents that bother one cases but not other. If this assumption is correct, it is more reasonable to evaluate dysfunctional obsessive beliefs by idiosyncratic measures that are more directed to each patient experience or accompanying them with structured or semi-structured interview (Berle & Starcevic, 2005).

Fifth, due to limited number of OCD cases, we did not take into consideration the heterogeneity of the OCD. It is reasonable to consider that not all the belief domains are relevant for all OCD subtypes and symptom presentation.

Sixth, as the clinical experience suggest, in an academic settings, finding adolescents who spend one hour on their obsessive thoughts and engaging in compulsive rituals is not a common

phenomenon. This adds to the secretive character of adolescents that might make them rationalize their unusual behaviors for others. Thus, in this study we decreased time criteria in ADIS (time dedicated to have obsessive thoughts and compulsive behaviors) to more than five minutes. This caused that we have more adolescents with obsessive compulsive disorders. This modification of time criteria should not be critical because according to our clinical experience among adolescents with OCD, the most important criteria that should be taken into account is the interference criteria (interference general and interference of obsessive compulsive behaviors in his/her scholar, daily and familial life).

8.3 Future studies

Although the present investigation advances current understanding about the association between obsessive beliefs and OCD symptom by employing both nonclinical and clinical samples, extensions of the present investigation will benefit from using different instruments assessing multiple symptom severity as well as assessments beyond self-reports (e.g.,behavioral assessments).According to Wheaton et al. (2010), inconsistencies in findings regarding the role of obsessive beliefs in OCD might refer to the manner in which OCD symptom dimensions are conceptualized and assessed in the literature. Many currently available measures of OCD assess specific forms of obsessions and rituals, rather than the severity of the symptom dimension.

Reflecting on past related studies, we observed that there is not any boundary between normal and pathological levels of cognitive constructs assessing by OBQ and TAF. It means that these measures do not have any cutoff points. Although these cognitive constructs are better conceptualized as a continuum, assigning cutoff points for them can facilitate identifying of the

boundary between abnormal and exaggerated behaviors. Future studies can explore appropriate cut off point.

For assessing obsessive beliefs, we relied on OBQ-44 and TAF. Although OBQ is suggested as the best available measure in terms of reliability, validity, and content coverage to assess obsessive beliefs (Taylor et al., 2010), it is not an exhaustive measure to assess all cognitive phenomena involved in OCD symptoms. Other suggested predicting constructs that are involved with obsessive-compulsive behaviors are: "not just right feelings" or a sense of incompleteness (Coles, Frost, Heimberg, & Rhéaume, 2003), "experiential avoidance" (Eifert & Forsyth, 2005), "contamination specific cognitions" (Deacon & Olatunji, 2007), and "beliefs about rituals or stop signals" (Wells, 1997, 2000). Furthermore, meta-cognitive aspects of information processing systems that monitor, interpret, and evaluate the content and process of cognition (Wells, 1997) are not adequately assessed by OBQ-44.Future studies can develop the knowledge on the contribution of cognitive construct in OCD symptoms by measuring the abovementioned cognitions.

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10. APPENDIXES

10.1. Appendix 1: Obsessive Beliefs Questionnaire (OBQ-44)

OBQ-CV

Redondea con un círculo el número que mejor indique **cuánto estás de acuerdo con cada uno de los pensamientos** que vienen más abajo. Ten en cuenta que los números indican:

0 = Totalmente en desacuerdo;
1 = Algo en desacuerdo;
2 = Ni de acuerdo ni en desacuerdo;
3 = Algo de acuerdo;
4 = Totalmente de acuerdo.

1	Muchas cosas a mi alrededor son peligrosas	0	1	2	3	4
2	Si no estoy completamente seguro de algo, lo más seguro es que me equivoque	0	1	2	3	4
3	Siempre quiero que las cosas estén perfectas	0	1	2	3	4
4	Para ser una buena persona, tengo que ser perfecto en todo lo que hago	0	1	2	3	4
5	Si puedo hacer algo, debo actuar para evitar desgracias	0	1	2	3	4
6	Debo intentar evitar cualquier tipo de peligro que pueda ocurrir	0	1	2	3	4
7	Pensar en hacer algo malo es tan malo como hacerlo de verdad	0	1	2	3	4
8	Si no hago nada cuando preveo un peligro, soy culpable de lo que pueda suceder	0	1	2	3	4
9	Si no puedo hacer algo de manera perfecta, entonces no debo hacerlo	0	1	2	3	4
10	Creo que debo esforzarme siempre al máximo	0	1	2	3	4
11	Cuando hago algo, pienso en cualquier cosa que pueda salir mal	0	1	2	3	4
12	Incluso errores de poca importancia significan que un trabajo no está bien hecho	0	1	2	3	4
13	Tener pensamientos agresivos hacia mi familia significa que, en el fondo, quiero hacerles daño	0	1	2	3	4
14	No soy capaz de elegir algo si no estoy completamente seguro	0	1	2	3	4
15	No evitar un peligro es tan malo como causarlo a propósito	0	1	2	3	4
16	Siempre estoy esforzándome por evitar problemas graves (por ej., enfermedades o accidentes)	0	1	2	3	4
17	Para mí, no prevenir un daño es tan malo como causarlo	0	1	2	3	4
18	Cuando cometo un error, debería enfadarme conmigo mismo	0	1	2	3	4
19	Debo asegurarme de que los demás no sufran daño por algo malo que yo pueda hacer	0	1	2	3	4
20	Creo que las cosas no están bien si no están perfectas	0	1	2	3	4

21	Tener malos pensamientos significa que soy una mala persona	0	1	2	3	4
22	Si no voy con mucho cuidado, corro peligro de sufrir o causar accidentes	0	1	2	3	4
23	Para quedarme tranquilo, debo estar preparado ante cualquier cosa que pueda salir mal	0	1	2	3	4
24	No debería tener pensamientos raros o sucios	0	1	2	3	4
25	Cometer un pequeño error es, para mí, tan malo como fallar por completo	0	1	2	3	4
26	Es importante tenerlo todo bien calculado, incluso los detalles de poca importancia	0	1	2	3	4
27	Pensar una barbaridad sobre una imagen sagrada es tan malo como hacerla de verdad	0	1	2	3	4
28	Debo ser capaz de librar mi mente de pensamientos no deseados	0	1	2	3	4
29	Creo que, por error, podría hacerle daño a otras personas	0	1	2	3	4
30	Tener malos pensamientos indica que soy raro o anormal	0	1	2	3	4
31	Debo ser el mejor en las cosas que son importantes para mí	0	1	2	3	4
32	Tener un pensamiento malo significa que realmente quiero llevarlo a cabo	0	1	2	3	4
33	Es horrible que a alguien le pueda ocurrir una desgracia por mi culpa	0	1	2	3	4
34	A menudo pienso que, aunque sea cuidadoso, van a pasar cosas malas	0	1	2	3	4
35	Tener malos pensamientos significa que puedo perder el control	0	1	2	3	4
36	Si no pongo mucho cuidado, pasará una desgracia	0	1	2	3	4
37	Debo seguir trabajando en las cosas hasta que quedan totalmente perfectas	0	1	2	3	4
38	Tener pensamientos violentos significa que perderé el control y me pondré agresivo	0	1	2	3	4
39	Si no hago todo lo posible por evitar las desgracias, soy culpable de que ocurran	0	1	2	3	4
40	Si no hago un trabajo perfecto, los demás no me tendrán en cuenta	0	1	2	3	4
41	Todo es peligroso	0	1	2	3	4
42	Pensar algo malo es tan malo como hacerlo	0	1	2	3	4
43	Haga lo que haga, nada me sale bien	0	1	2	3	4
44	Si no controlo mis pensamientos, merezco que me castiguen	0	1	2	3	4

10.2. Appendix 2: Thought- Action Fusion questionnaire-adolescent version (TAF-A)

TAFQ-A

Redondea con un círculo el número que mejor indique **cuánto estás de acuerdo** con cada una de las creencias que vienen más abajo. Ten en cuenta que los números indican:

0 = Nada de acuerdo;
1 = Poco de acuerdo;
2 = Bastante de acuerdo;
3 = Totalmente de acuerdo.

1	Supón que estás con un amigo. De pronto, sin ninguna razón, piensas que tu amigo es estúpido. Creo que tener este pensamiento es casi tan malo como decirle realmente a mi amigo que es estúpido	0	1	2	3
2	Supón que, de pronto, sin ninguna razón, tienes el pensamiento de que te estás muriendo. Creo que tener este pensamiento aumenta el riesgo de que realmente me pueda morir.	0	1	2	3
3	Supón que, de pronto, sin ninguna razón, tienes el pensamiento de que despiden a tu padre del trabajo y de que tenéis problemas de dinero en casa. Creo que tener este pensamiento aumenta el riesgo de que realmente despidan a mi padre.	0	1	2	3
4	Supón que te encuentras con un compañero de clase. De pronto, sin ninguna razón, piensas en insultarlo. Creo que tener este pensamiento es casi tan malo como insultarlo realmente.	0	1	2	3
5	Supón que, de pronto, sin ninguna razón, tienes el pensamiento de que un coche te atropella. Creo que tener este pensamiento aumenta el riesgo de que un coche realmente me atropelle.	0	1	2	3
6	Supón que estás sentado en la clase. Todos tus compañeros están trabajando en silencio. De pronto tienes el pensamiento de pegar un grito con todas tus fuerzas. Creo que tener este pensamiento es casi tan malo como pegar el grito de verdad.	0	1	2	3
7	Supón que, de pronto, sin ninguna razón, tienes el pensamiento de que te pones muy enfermo. Creo que tener este pensamiento aumenta el riesgo de que realmente me ponga enfermo.	0	1	2	3
8	Supón que en una calle silenciosa, te encuentras a un niño más pequeño. De pronto, sin ninguna razón, se te ocurre tirarlo al suelo. Creo que tener este pensamiento es casi tan malo como realmente tirarlo al suelo.	0	1	2	3
9	Supón que, de pronto, sin ninguna razón, tienes el pensamiento de que tu padre tiene un accidente de coche. Creo que tener este pensamiento aumenta el riesgo que mi padre realmente tenga un accidente.	0	1	2	3

10	Supón que vas andando por la calle y te encuentras con una persona desconocida. De pronto se te ocurre hacerle un gesto irrespetuoso. Creo que tener este pensamiento es casi tan malo como hacerle realmente el gesto irrespetuoso.	0	1	2	3
11	Supón que, de pronto, sin ninguna razón, tienes el pensamiento de que tu madre se está muriendo. Creo que tener este pensamiento aumenta el riesgo de que mi madre realmente se muera pronto.	0	1	2	3
12	Has oído que los padres de un compañero están divorciándose. De pronto, se te ocurre gastarle una broma acerca del divorcio de sus padres, aunque no llegas a gastársela. Creo que tener este pensamiento es casi tan malo como gastarle realmente la broma.	0	1	2	3
13	Supón que, de pronto, sin ninguna razón, tienes el pensamiento de que vas a repetir el curso. Creo que tener este pensamiento aumenta el riesgo de que realmente repitas el curso.	0	1	2	3
14	Supón que ves el monedero de tu madre. De pronto tienes el pensamiento de robarle un poco de dinero del monedero. Creo que tener este pensamiento es casi tan malo como robarle realmente dinero del monedero.	0	1	2	3

10.3. Appendix 3: Paper 1: Noorian,Z., Granero,R.,Ferreira,E., Romero-Acosta,K.,& Domenèch-Llaberia,E. (2013).Obsessive-Compulsive Symptoms among Spanish Adolescents: Prevalence and Association with Depressive and Anxious Symptoms. Spanish Journal of Psychology , 16, 98, 1–11.

Obsessive-Compulsive Symptoms among Spanish Adolescents: Prevalence and Association with Depressive and Anxious Symptoms

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Abstract. The present study examines the prevalence of obsessive-compulsive symptoms (OCS) in a population 1,061 adolescents (mean age 13.92) in Spain. The association between OCS and anxiety symptoms severity (panic attacks, separation anxiety, social phobia, generalized anxiety and school phobia) and depressive symptom severity has also been studied. Two distinct groups of subjects were defined and analyzed as being 'positive' on the obsessive-compulsive screen: The first group (called *High interference*) included all of the subjects who scored 25 or more in Leyton Obsessional Inventory-Child Version (LOI-CV) interference score regardless of symptom presence score, and the second group (labeled *High symptom presence*) consisted of all subjects with a symptom presence score equal to or above 15 and an interference score of 10 or less. Females scored higher than did males both on the symptom presence and interference scores. Forty- one subjects (3.9%) showed an interference score of 25 or more (high interference group) while eight students (0.8%) were included in the high symptom presence group. The most prevalent and interfering symptoms were: fussy about hands, hating dirt and contamination and going over things a lot. In addition, the association between LOI and depressive symptom severity was significant, while the association between LOI and anxiety symptoms severity was insignificant.

Obsessive-compulsive disorder (OCD) is a severe and disabling psychiatric condition among children and adolescents with prevalence estimates ranging from 0.17% to 4% (Costello et al., 1996; Flament et al., 1988; Heyman et al., 2003; Valleni-Basile et al., 1994; Zohar, 1999). The phenomenology of childhood and adolescence OCD is understood to be broadly similar to that of an adult. Obsessions are defined by the DSM-IV (American Psychiatric Association, 2000) as intrusive and repetitive thoughts, images, or impulses. They are associated with significant negative affect, most commonly anxiety, although children may also report feelings of guilt, sadness or anger.

The most common obsessions in children include contamination, aggression (harm or death), symmetry and exactness (just right), while in adolescence, religious and sexual obsessions are also common (Franklin et al., 1998; Geller et al., 2001).

Compulsions are defined as purposeful, repetitive behaviors or rituals performed in an effort to relieve the distress or negative affect associated with the obsessions (American Psychiatric Association, 2000). Compulsions themselves can be highly distressing and frustrating in the child's family, school and social life, with a high degree of familial conflict and frustration (Cooper, 1996).

In terms of common compulsive behaviors in young people, we can mention washing, checking, ordering, touching, repeating, and reassurance seeking (Franklin et al., 1998; Wever & Rey, 1997). However, compulsions can also include covert behaviors, such as reviewing or canceling thoughts, silent prayers or counting (Franklin et al., 1998).

In spite of adult symptoms, childhood symptoms tend to vary greatly, with many young people having all of the common obsessions and compulsions at some point, and seldom display a single compulsion (Hanna, 1995; Mataix-Cols et al., 2002; Wever & Rey, 1997).

The mean age of onset in juvenile OCD is more typically reported to be around 10.4 years, in a range of 6.9–12.5 years (Stewart et al., 2004). Studies of adult OCD have suggested that the age of onset may be bimodal,

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with the first peak occurring in puberty (30% – 70% of adults recall the presence of symptoms in adolescence), and the second in early adulthood (mean age of 21 years Pauls, Alsobrook, Goodman, Rasmussen, & Leckman, 1995; Rasmussen & Eisen, 1992). These observations would suggest that adolescence could be a period in which genetic and environmental etiological factors in OCD change in a relatively short period of time (Van Grootheest et al., 2008).

Epidemiological studies of obsessive-compulsive disorders report equal gender distributions in adolescent and adult samples (Flament et al., 1988; Rasmussen & Eisen, 1992), while in the clinical adult sample equal gender distribution can be seen, and in the clinical juvenile sample a dominance of males to females is reported (61% – 69%; Geller et al., 2001; Hanna, 1995; Mancebo et al., 2008; Swedo, Rapoport, Leonard, Lenane, & Cheslow, 1989).

Although many studies have addressed the phenomenology and epidemiology of OCD in adult populations, less attention has been given to childhood and adolescence OCD. In comparison, other mental disorders (such as depression and schizophrenia) have received more attention in this regard. Furthermore, as clinical experience asserts, OCD in all age-groups, and especially in younger sufferers, is under-recognized because they are known to be secretive about their disorder (Jenike, 1989), and the pathological nature of their symptoms is not always recognized (Scahill et al., 1997). On the other hand, when afflicted young patients are asked specific questions about obsessive-compulsive symptoms (OCS), they identify their symptoms very reliably without significant interference in their daily life. Hence, the epidemiological study of OCS among adolescents has the benefit of early detection and treatment to modify the degree of chronic impairment in the future.

In an attempt to provide detailed information about the prevalence of obsessive- compulsive behaviors among adolescents, Flament et al. (1988) provided some of the most reliable data. They carried out a large longitudinal epidemiological study on over 5,000 students by applying LOI-CV as a screening instrument, and they found out that almost 2% of adolescents have obsessive preoccupations or behaviors. Afterwards, several studies were performed to identify obsessive-compulsive preoccupations among adolescents. Thomsen's study applying LOI-CV on a population of 1,032 Danish adolescents aged 11–17 years, in 1993, found that 4% of non-referred Danish adolescents had a total interference score reflecting probable clinical or subclinical OCD; however, an interview did not follow their study. In 2001, Maggini et al. (2001), after doing an epidemiological survey in more than 2,800 high school students in Italy, found that 4.1% of their subjects showed OCS which interfered with their

daily life (an interference score of 25 or more in LOI-CV), while 3.0% of students showed OCS without interfering in their normal life. According to another study done in Poland (Bryńska & Wolańczyk, 2005) on more than 3,000 students between 13 and 14 years of age, 5.5% of the population suffered from obsessive-compulsive behaviors.

The comorbidity of OCD with other mental disorders, rather than anxiety disorders, has been well-documented in clinical and community samples of adolescents (Flament et al., 1988; Geller et al., 2001; Geller et al., 2003; Hanna, 1995; Swedo et al., 1989). However, little is known about the association between OCS and other anxiety symptoms, such as generalized anxiety, separation anxiety, panic, social phobia and school phobia, especially when these symptoms are not assessed with the same self-report instrument. Accordingly, we attempt to contribute to this area with the present study.

Studying the association between OCS and depressive symptoms is another focus of this study. There is plenty of research (Brady & Kendall, 1992; Seligman & Ollendick, 1998) indicating that there is a considerable overlap between anxiety and depressive symptoms in the young that is measured by commonly used self-report questionnaires. Depression and OCS normally accompany each other in many cases. An overwhelming need to perform rituals and the inability to get rid of obsessive thoughts can eventually lead to isolation, hopelessness and depressive symptoms (Grados, Labuda, Riddle, & Walkup, 1997). Assessing the comorbid anxiety and depression symptoms among adolescents with high OCS can improve knowledge of etiological bases of symptoms and apply different treatment strategies that facilitate overcoming the negative consequence of comorbid symptoms in one's daily life in school, home and society.

Since the prevalence of OCS among adolescents varies across studies, further research in community samples is needed to complete our knowledge on the phenomenology, prevalence and distribution of obsessive-compulsive behaviors. In this regard, our main research aims are: a) to estimate the prevalence of OCS in a community sample of adolescents in the municipality of Rubi (Barcelona), b) to explore the association of OCS with anxiety symptoms severity, such as separation anxiety, generalized anxiety, social/school phobia and panic/somatic symptoms, and c) to assess the association of OCS with depressive symptom severity.

Method

Sample

The sample was obtained from the census of 2009 in the eighth and ninth grades in nine public and private

schools in Rubi (*N* = 1,324), a city near Barcelona. Rubi was selected for two main reasons: First, Rubi is a city with almost 73,000 inhabitants according to the latest report of the Spanish Instituto Nacional de Estadística (INE; 2010). There are 11,593 (16%) foreigners, of which 2,071 are younger than 16 years old. Thus, it could be a representative region with a middle socio-economic class and, second, the interest of the administration of the educational system to collaborate with us in examining emotional problems, including depression and all anxiety symptoms in all schools of this city.

On the day of assessment at the schools, 218 students were absent. Forty-three students were not authorized by their parents and two students did not show any interest in participating in this research. Due to the difficulties in understanding the language, six students could not answer the questionnaires. Therefore, the final sample included 1,061 adolescents, 497girls (47.3%) and 554 boys (52.2%). The participation ratio was 80%. The age of the participants ranged between 13 to 17 years old. Almost 70% of the participants belong to middle and lower-middle socio-economic classes according to Hollingshead (1975). Table 1 shows the socio-demographic features of the participants.

Procedure

The research was approved by the Ethics Committee in Human Experimentation and by the Research Committee of the authors' institution. The collaboration of all of the secondary schools located in Rubi, Barcelona, was requested. All of the schools accepted to participate in this study. Data collection was between 4 February and 15 June 2010. Signed consent was required from parents and oral consent by adolescents. The time necessary for completing the questionnaires was about 50 minutes. During the assessment with the

Table 1. *Description of the sample*

Gender: *N (%)*	Male	559 (52.7%)
	Female	502 (47.3%)
Socio-economic status; *N (%) (Hollingshead,1975)*	High-middle	242 (23.5%)
	Middle	317 (30.8%)
	Middle -low	470 (45.7%)
	Missing	32 (3.0%)
Age (year); *N (%)*	13 years-old	331 (31.2%)
	14 years-old	510 (48.1%)
	15 years-old	192 (18.1%)
	16 years-old	27 (2.5%)
	17 years-old	1 (0.1%)
	Unknown	1 (0.1%)
	Mean (SD)	13.92 (0.76)
Nationality %	Spanish	834 (78.8%)
	Non Spanish	225 (21.1%)

self-report questionnaires, two researchers were present in the classroom to answer possible questions about items. Once each student completed the questionnaires, researchers carefully checked the items to avoid missing data. In this research, all questionnaires were performed in Spanish.

Instruments

Leyton Obsessional Inventory-Child Version (LOI-CV; Berg, Rapoport, & Flament, 1986)

This is a 20-item self-report questionnaire that assesses the presence or absence (yes versus no) of a number of obsessive concerns and behaviors and the degree of interference of each behavior in personal functioning. LOI-CV explores general obsessive thoughts and rituals including repeating, checking, counting, indecisiveness, dirt-contamination fears, lucky numbers, and school-related habits. This instrument comprises two subscales. The first records the presence or absence of common obsessions and compulsions that are related to symptoms. Each response is scored 1 for the presence and 0 for the absence of the symptom; thus, this subscale yields a maximum score of 20. The second subscale records the degree of interference of the symptoms in the daily life of the subject. Each symptom is scored on a 4-point scale of 0–1–2–3, ranging from 0 – "this habit does not interfere with my life" to 3 – "I waste a lot of my time because of this habit". The maximum score in this subscale is 60. A response for the degree of interference is required only for the items endorsed on the symptoms subscale (Roussos et al., 2003).

LOI-CV is described in the literature as a reliable instrument with high sensitivity and specificity for the screening of OCD (Flament et al., 1988). In the study of Bamber, Tamplin, Park, Kyte, and Goodyer (2002), internal reliability was high for the total scale (α = .86). LOI- CV showed an acceptable internal consistency (α = .79) in the most recent study conducted among 50 American children and adolescents with OCD (Storch et al., 2011), but it was not significantly correlated with any other measures of OCD symptom frequency or severity, OCD- related impairment and global symptom severity in a pediatric OCD sample. In our study, internal consistency was also good (α = .75 for the "symptom presence score" and α = .87 for the "interference score"). Choosing this instrument as a widely used questionnaire for assessing obsessive-compulsive preoccupations let us compare our results with previous studies.

Children's Depression Inventory (CDI; Kovacs, 1992)

This is one of the most widely used self-report questionnaires to assess the severity of depressive symptoms in

7 to 17 year-old adolescents and children. It includes 27 items whose scores ranged between 0 and 2 (total score was in the range 0 to 54). It can also be used as a screening tool, to assess treatment results, or to detect changes in depressive symptoms over time (Canals, Marti-Henneberg, Fernández-Ballart, & Domènech, 1995). The clinical cut-off of 17 for the total-CDI score is considered to have the best sensitive ty and specificity in the Spanish general population (Canals et al., 1995). In this study, internal consistency was very good (α = .83).

Screen for Child Anxiety Related Emotional Disorders (SCARED; Birmaher, et al., 1997)

It is a new questionnaire developed to measure children's and adolescents' anxiety. It includes 41 items grouped into five subscales that assess anxiety disorders symptoms according to DSM-IV criteria: panic/somatic (e.g., "When frightened, my heart beats fast"), generalized anxiety (e.g., "I am a worrier"), separation anxiety (e.g., "I don't like being away from my family"), social phobia (e.g., "I don't like to be with unfamiliar people"), and school phobia (e.g., "I am scared to go to school"). Adolescents are asked to rate the frequency which they experience using an ordered scale (0 almost never, 1 sometimes, and 2 often). A cut-off of 25 on the SCARED resulted in the optimal sensitivity (71%) and specificity (67%) in a clinical American sample (Birmaher et al., 1997). SCARED possesses adequate internal consistency and test-retest stability (Birmaher et al., 1997; Spence, 1998). It also possesses adequate discriminating validity to differentiate between children with and without specific anxiety disorders (Birmaher et al., 1997; Muris, Merckelbach, Mayer, & Prins, 2000; Spence, 1998).

The Spanish version of the SCARED used in our study had previously been validated and translated into Spanish by Domènech and Martínez (2008) in an adolescent community sample. This Spanish version showed good psychometric properties with Cronbach's alpha values between .68 and .83 and test-retest reliability equal to 0.72. In this study the internal consistency was very good (α = .85 for SCARED total score).

Socio-demographic questionnaire

The subjects completed a socio-demographic questionnaire designed by the authors, which asked adolescents about gender, date and place of birth, ethnic background, marital status of their parents, educational level of their parents and their employment status. In addition, we included indicators of the Hollingshead scale (Hollingshead, 1975) for evaluating the socio-economic status (SES) of their parents.

Statistical Analysis

Statistical analysis was carried out with PASW17 (SPSS Software). According to the indication of Flament et al. (1988), two distinct groups of subjects were defined as 'positive' in the screening. The first group, labeled 'high interference' (vs. low interference), differentiated between adolescents with scores equal to or higher than 25 in the interference score. The second group, called 'high symptom presence', included adolescents with scores equal to or above 15 in the yes-no items and an interference score lower than 10. In fact, choosing Flament's indication, with the adequate reported sensibility (75%) and specificity (84%), allows us to compare our study with other research in this area.

After creating the groups in this study, the prevalence of adolescents with a high interference score and high symptom presence score was estimated.

The prevalence of adolescents with a high interference scores (interference score equal to 3) and the prevalence of all LOI-CV items was also estimated. The prevalence classified by gender was assessed through logistic regressions adjusted by participants' ages.

Linear regression adjusted by children's gender, age, and SCARED total score were used to explore the association between LOI-CV (for variables, "symptom presence score" and "interference score") and CDI total score. This procedure also tested the association between LOI-CV and SCARED total score (considering total score and the five subscales). This analysis was adjusted by the covariates gender, age and the level of depressive symptoms severity (CDI total score).

Association between gender and LOI-CV scores was assessed by logistic regression (for binary classifications in LOI) and linear regression (for quantitative scores in LOI). All of these regressions were adjusted by participants' ages and the CDI total score.

Results

The association between LOI high scores, LOI total, and gender

In this study, forty-one subjects [3.9%, 95% CI: 2.73% to 5.07%] showed an interference score of 25 or more (high-interference group). Eight students [0.8%, 95% CI: 0.45% to 1.75%] were included in the high-symptom presence group. They showed a symptom presence score of 15 or more and interference score of 10 or less. Table 2 includes the association between gender and high LOI scores and total scores. Considering the binary classifications for LOI (high interference score and high-symptom presence score), logistic regression adjusted by adolescents' ages did not show any significant difference between boys and girls, neither in the high interference [p = .13; OR = 1.61, 95% CI: 0.85 to 3.05]

nor in the high-symptom presence groups [p = .56; OR = 0.65, CI: 0.15 to 2.75]. Nevertheless, multiple regression adjusted by adolescents ages showed that girls scored significantly higher than did boys on both the total- symptom presence score [p = .002; B = 0.71, 95% CI: 0.26 to 1.16] and interference score [p = .039; B = 1.00, 95% CI: 0.05 to1.95]

The association between gender and LOI-CV high scores and total score

Table 3 includes LOI-CV symptoms and high-interference prevalence in both gender groups. The most frequent symptoms (more than 60% frequency) among students were fussy about hands, hate dirt and contamination, go over things a lot (repetition), worry about being clean enough, repeated thoughts or words and bad conscience though having done nothing wrong. The most interfering symptoms were worrying about being clean enough, fussy about hands, hating dirt and contamination and going over things a lot (repetition). Four items ('repeated thoughts or words', 'hate dirt and contamination', 'indecisiveness' and 'go over things a lot') were significantly more frequent in females than they were in males, while only one item ('to get angry if someone messes the desk') was more frequent in males than it was in females. Males showed significantly higher interference scores than did females on the items 'angry if someone messes desk' and 'spend extra time in checking homework', and females showed significantly more interference on the items 'indecisiveness' and 'bad conscience though having done nothing wrong'.

The association between LOI, CDI and SCARED

Table 4 includes the association between LOI-CV, CDI, and SCARED. Linear regressions adjusted by adolescents' gender, age and SCARED total score showed that the association between the LOI interference score and the LOI total-symptom presence score and the Children´s Depression Inventory(CDI) was significant and positive. As summarized in Table 4, participants with the highest scores in the depression scale were also those with the highest scores in LOI.

However, after adjusting for a subject's gender, age and CDI total score, linear regressions did not show any significant association between the LOI total interference score and SCARED, neither for total score, nor for any of the SCARED subscales. The same result was found for the association between the LOI total-symptom presence score and SCARED total and its five subscales.

Discussion

Following the indication of Flament et al. (1988) and Berg, Whitaker, Davies, Flament, & Rapoport (1988) the interference score of LOI-CV represents the best indicator of obsessive-compulsive psychopathology. They suggest that the symptom -presence score reflects a normal concern and general worries among adolescents, but items with high interference may be more clinically predictive and may reflect the proportion of adolescents with subclinical and clinical OCD. In our study, about 3.9% of the population showed a significant interference of obsessive symptomatology in daily activities. This percentage is comparable to what is reported by Thomsen (1993) in Denmark and Maggini et al. (2001) in Italy (Table 5). Our finding is about twice more than what was found by Flament et al. (1988). These discrepancies might reflect differences between European countries and The United States of America (USA), although there seem to be no dissimilarities in the prevalence of OCD in the general population between the USA and Europe (Rasmussen & Eisen, 1992). The dissimilarity that can be seen between our study and the Polish study can be related to differences

Table 2. *Association between gender and LOI-high scores and total scores*

High scores in LOI-CV	Percentages (%)			Logistic models adjusted by age			
	Total	Boys	Girls	OR	*p*	95% CI (OR)	
Interference>=25	3.9	3.1	4.6	1.61	.13	0.85;	3.05
Symptom presence score >=15 & interference <=10	0.8	0.9	0.6	.65	.56	0.15;	2.75
	Means			Multiple regressions adjusted by age			
Total scores in LOI-CV	Total	Boys	Girls	B	*p*	95% CI (B)	
LOI- CV: total symptom presence score	8.54	8.16	8.89	.71	.00	0.26;	1.16
LOI-CV: total interference score	8.41	7.94	8.95	1.00	.03	0.05	1.95

Table 3. *The percentage of LOI-CV "symptom presence score" and "high interference" (interference score =3) in 1,061 adolescents*

LOI Items	Symptom presence score (symptom prevalence)						High interference score (interference score = 3)					
	Prevalence (%)			Logistic regression			Prevalence (%)			Logistic regression		
	Total	Boys	Girls	OR	95% CI (OR)		Total	Boys	Girls	OR	95% CI (OR)	
1. Do certain things(have to)	23	24	22	.85	0.61	1.19	1.53	1.27	1.81	1.91	0.54	6.66
2. Repeated thoughts or words	60	54	67	1.48*	1.10	1.97	5.25	3.62	7.06	1.22	0.64	2.32
3. Check several times(have to)	56	54	59	1.09	0.82	1.44	4.38	3.61	5.23	1.92	0.92	3.96
4. Hate dirt and contamination	76	71	81	1.77*	1.28	2.44	9.81	8.48	11.29	1.39	0.86	2.24
5.Something touched is spoiled	10	11	9	.95	0.61	1.48	0.57	0.72	0.40	.43	0.04	4.18
6.Indecisive(a frequent problem)	57	49	66	1.87*	1.40	2.48	7.16	4.15	10.53	2.61*	1.50	4.54
7. Worry about clean enough	61	61	61	.84	0.64	1.11	10.90	10.67	11.16	.75	0.47	1.20
8. Fussy about hands	79	77	81	1.0	0.73	1.45	10.22	9.42	11.11	1.18	0.72	1.92
9 . At night put thing away just right	30	28	33	1.29	0.95	1.73	4.58	4.16	5.04	1.05	0.53	2.04
10. Angry if someone mess desk	43	48	37	.50*	0.38	0.67	4.30	5.63	2.82	.34*	0.16	0.71
11. Spend extra time in checking homework	24	26	23	.75	0.54	1.04	1.62	2.17	1.01	.24*	0.07	0.76
12. Repetition until correct	45	42	48	1.11	0.83	1.47	3.44	2.89	4.04	1.54	0.70	3.35
13. Need to count several times	16	16	17	.95	0.65	1.38	1.24	1.62	0.80	.47	0.11	1.92
14. Trouble finishing school Works	28	28	27	.75	0.55	1.02	2.86	3.07	2.62	.56	0.24	1.33
15. Favorite or special number	19	20	18	.92	0.64	1.33	2.67	2.89	2.41	.52	0.21	1.29
16.Bad conscience though done nothing wrong	60	54	67	1.32	0.98	1.75	5.64	3.27	8.28	2.34*	1.22	4.49
17.Doing things in exact manner	55	54	57	.93	0.71	1.24	6.58	5.60	7.68	1.14	0.62	2.06
18.go over things a lot (repetition)	68	62	75	1.48*	1.08	2.01	7.44	4.87	10.30	1.70	0.97	2.97
19. Talk or move to avoid bad luck	21	21	21	.80	0.55	1.16	2.00	1.81	2.21	1.40	0.48	4.04
20. Special number or words to avoid	18	18	18	1.09	0.73	1.61	2.38	2.53	2.22	.70	0.27	1.84

OR coefficients adjusted by subject's age. *Significant OR (.05 level).

Table 4. *Association between LOI-CV, CDI and SCARED total and its five subscales*

Multiple regression adjusted by gender, age and SCARED score	B	P	95% CI (B)	
CDI total*LOI total interference	.26	.00	0.17	0.34
CDI total *LOI total yes score	.06	.00	0.02	0.10
Multiple regression adjusted by gender, age and CDI total score	**B**	**P**	**95% CI (B)**	
SCARED generalized anxiety*LOI total interference	.64	.72	–2.96	4.25
SCARED panic *LOI total interference	.55	.76	–3.03	4.14
SCARED separation anxiety*LOI total interference	.71	.69	–2.89	4.31
SCARED social phobia *LOI total interference	.09	.96	–3.51	3.69
SCARED school phobia *LOI total interference	.29	.87	–3.33	3.91
SCARED total *LOI total interference	–.18	.91	–3.78	3.40
SCARED generalized anxiety*LOI total yes score	.75	.38	–0.95	2.46
SCARED panic*LOI total yes score	.47	.58	–1.22	2.18
SCARED separation anxiety*LOI total yes score	.61	.48	–1.09	2.32
SCARED social phobia *LOI total yes score	.45	.60	–1.26	2.15
SCARED school phobia *LOI total yes score	.42	.62	–1.29	2.14
SCARED total*LOI total yes score	–.39	.65	–2.09	1.31

Logistic regression adjusted by adolescents' gender, age and CDI total.

Table 5. *Comparison of high symptom presence score and high interference score among studies performed with LOI-CV on adolescent population*

Authors (years)	Sample	Mean age (range)	Country	High interference	High symptom presence
Flament et al. (1988)	5,108	16.2 (14–17)	USA	1.6%	0.7%
Thomsen (1993)	1,032	13.8 (11–17)	Denmark	4.1%	1.4%
Maggini et al.(2001)	2,991	17.4 (16–21)	Italia	4.1%	3.0%
Brynska &Wolanczyka (2005)	2,884	13.5 (13–14)	Poland	5.5%	0.9%
Present study	1,061	13.9 (13–17)	Spain	3.9%	0.8%

between Eastern and Western European nations in anxiety and depression symptoms (Boyd, Gullone, Kostanski, Ollendick, & Shek, 2000), as adolescents from countries such as Bulgaria, Poland and Russia report higher levels of anxiety and depression symptoms.

In the present study, the rate of the high-symptom presence score was 0.8%, which is comparable with the findings of Flament et al. (1988) and the Polish study but lower than findings in Italy and Denmark. This discrepancy can refer to a different strategy of applying the same questionnaire. Like Flament's study and the study done in Poland, our questionnaires were not done confidentially because in our study, LOI was used as a screening instrument. On the other hand, a high-symptom presence score is the sign of ego-syntonic OCS and can be considered as a sign of obsessive personality disorder (OCPD) or more severe and nearly psychotic OCD (Insel & Akiskal, 1986). Hence,

the low prevalence of a high-symptom presence score in a community sample seems reasonable.

Table 5 includes the comparison between the high-symptom presence score and interference score among studies in which the LOI-CV was applied to an adolescent population.

In this study, the most frequently reported symptoms (a frequency of more than 60%) were concerns of contamination (fussy about hands, hate dirt and contamination, worry about being clean enough), repetition (go over things a lot, repeated thought or word) and bad conscience though having done nothing wrong. This outcome was expected because the obsessive-compulsive phenomenon related to the dirt phobia is widely reported in different studies and is culturally accepted (Bryńska & Wolańczyk, 2005; Flament et al., 1988; Maggini et al., 2001; Okasha et al., 2001; Roussos et al., 2003; Thomsen, 1993). In addition, repetitions that can reflect a lack of sureness or doubt are a

characteristic of adolescents and have been widely reported across studies exploring childhood OCD (Bryńska & Wolańczyk, 2005; Roussos et al., 2003).

The most interfering items in this study were concerns of contamination ('fussy about hands', 'hate dirt and contamination', 'worry about being clean enough') and repetition ('go over things a lot'). Although almost 10% of adolescents in our study suffered from dirt phobias, which have high interference with daily life, these behaviors can only be diagnosed as pathological on the basis of the time they consume, their intensity and impact upon functioning and the distress they cause. Such clarification can only be achieved through interview, while LOI-CV identifies only the interference aspect.

In our study, females showed significantly more symptoms and higher interference scores than did males. This finding can reflect sex stereotypes or a higher level of anxiety in girls (Lewinsohn, Gotlib, Lewinsohn, Seeley, & Allen, 1998). This finding can also be compared with those of Berg et al. (1988); Brynska and Wolańczyk (2005); Maggini et al. (2001) and while it is in contrast with the findings in the Danish population, in which no difference was found in the symptom presence score and interference score between gender groups. A totally different finding was reported by ZhanJiang, BingWu, and JiSheng (2003), who studied 3,185 Chinese students. They found no gender-based difference in the total-symptom presence score, but rather a predominance of males in the total interference score. In a study of 2,552 Greek adolescents (Roussos et al., 2003), females reported more symptoms in LOI-CV. However, in the interference score, boys tended to score higher than did girls, generally, in items related to worrying about cleanliness and a lack of control. In the present study, females significantly showed four symptoms more than did males: 'repeated thoughts or words', 'hate dirt and contamination', 'indecisiveness' and 'go over things a lot', while the only item that was more frequent in males was to get angry if someone messes the desk.

In the interference score, males showed significantly higher rates than did females in two items: 'spend extra time in checking homework' and 'angry if someone messes desk'. Interestingly, among Italian and Greek boys Item 9 (angry if someone messes desk) was reported as an item with higher interference. This can reflect the need of boys to have control over their possessions, including their desk. Item 11 (checking homework several times) is also rated as being more interfering among boys. According to Roussos et al. (2003), this item can be considered more distressing rather than interfering among boys. They believe that adolescents tend to rate interference on the basis of the level of distress and embarrassment that the symptom

causes rather than on the interference itself. However, in our study, just 26% of boys, as compared to 25% of girls, showed this symptom, and for boys checking homework can be a more distressing responsibility.

In our study, two items were more interfering among females, when compared with males: 'a bad conscience though having done nothing wrong' and 'indecisiveness'. This finding can refer to a high level of anxiety among girls.

At least nine items on LOI-CV were expressed by 50% or more of the participants. More than 70% of respondents showed Items 4 ('hate dirt and contamination') and 8 ('fussy about hands').

In our study, there was a tendency toward a higher interference score for symptoms with higher prevalence. In six items out of nine with prevalence of more than 50%, the interference score was also high. The majority of participants in this study showed multiple obsessional symptoms, many more than would be expected, given the population prevalence of OCD. This finding can be related to the methodological bias (questionnaire) or to the fact that intrusive thoughts commonly occur in 77%–85% of children in non-clinical samples (Allsopp & Williams, 1996; Crye, Laskey, & Cartwright-Hatton, 2010). Alternatively, it has been suggested that some obsessional symptoms may be developmentally appropriate and may dissipate with age (Berg et al., 1988; Evans et al., 1997). Our findings support this idea because, although most subjects showed multiple obsessional symptoms, only 3.9% met cut-off criteria for probable OCD. This suggests that even if obsessiveness and OCD form a single continuum, not all types of obsessiveness are associated with OCD. Moreover, there may also be qualitative factors that predispose some individuals to OCD but not others.

Hypothetically, it is difficult to find a true cause for the etiology of OCD. Possible suspected causal influences reported for OCD include: birth abnormalities, intelligence, heritability, parental mental health, socio-economic status and an abnormally high anxiety response to intrusive thoughts (Douglass, Moffitt, Dar, McGee, & Silva, 1995). Nevertheless, recent studies emphasize more on additive genetic effects and non-shared environmental factors (Taylor, 2011). Keeping in mind that symptom patterns alone are unlikely to be sufficient predictors of clinically significant psychiatric illness, further assessment of impairment and distress or other complicating factors is necessary.

The association between OCS and anxiety symptoms severity

After controlling for interfering variables like gender, age, and depression, linear regression did not show any significant correlation between anxiety symptoms

severity and obsessive-compulsive behaviors. Thus, it can be concluded that people with OCS did not show more anxiety symptoms like panic, separation anxiety, generalized anxiety, social and school phobias. Although we have only studied obsessive-compulsive symptoms, not disorder, our findings are in line with previous studies like Ferdinand, Dieleman, Ormel, and Verhulst (2007), which focused on OCS. Accordingly, a question that is worth exploring is whether OCD should be classified as one of the putative obsessive-compulsive related disorders or as one of the anxiety disorders.

The association between OCS and depressive symptom severity

The association between depression and obsessive-compulsive behavior was significant, even after controlling for gender, age and anxiety symptoms severity.

Depressive disorders tend to be the most common comorbid diagnoses in OCD. For example, in the NIMH sample of 70 children, only 18 (26%) had OCD as their only diagnosis, while 35% received a comorbid diagnosis of depression (Swedo et al., 1989). The proportion has been estimated to be almost two-thirds of all cases in some studies (Pediatric OCD Treatment Study [POTS] Team, 2004; Pigott, L'Heureux, Dubbert, Bernstein, & Murphy, 1994). However, a detailed multivariate analysis of a large epidemiological sample suggested the proportion of 17% (Andrews, Slade, & Issakidis, 2002).

The data suggest that there is a strong association between OCS and depressive symptoms although future research should examine the temporal order of OCS and depressive symptoms.

The ascertainment of obsessions and compulsions in community samples is particularly difficult because most participants are not familiar with this rare phenomenon, and normal behaviors could be mistakenly considered as being psychiatric symptoms (Breslau, 1987).

As pointed out by Flament et al. (1988), LOI-CV yields not only in a few false-negative cases but also in a large number of false-positive cases. For this reason, our results must be taken with caution due to the possibility of an overestimation. Nevertheless, in the present study, the risk of pathologically considering some normal cognitions and behaviors was diminished because of the clarifications that two researchers gave to the participants.

Another limitation of this study was about the Spanish validation of LOI-CV and SCARED. Currently, the two questionnaires have been validated in large Spanish samples, but results have not been published yet.

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10.4. Appendix 4: Paper 2: Noorian, Z; Fornieles Deu,A; Romero-Acosta, K; Ferreira,E., & Domenèch-Llaberia, E.(2014).The contribution of dysfunctional obsessive beliefs in obsessive-compulsive symptoms among adolescents, International Journal of Cognitive Therapy (second revision)

Abstract

Although there are several studies concerning to assess the role of dysfunctional "obsessive beliefs" in the development of obsessive-compulsive (OC) symptoms, little is known about the contribution of these beliefs among adolescents. In this study 966 adolescents aged between 13 to 16 years completed questionnaires measuring obsessive beliefs, thought-action fusion (TAF), obsessive compulsive, depression and anxiety symptoms.

Findings from various statistical analyses indicate that all OC symptom dimensions assessed by LOI-CV were significantly associated with all of the obsessive beliefs measured by OBQ-44.The partial correlation controlling for depression symptoms doesn't change the significance of the relation but the magnitude of the correlation. Linear regression analysis shows that perfectionism and intolerance of uncertainty accompany depression and anxiety symptoms predict all of the OC symptoms dimensions. More over TAF-likelihood belief predicts mental compulsion and superstition symptom. The implications of this study for therapy processes are discussed.

Introduction

Obsessive-compulsive disorder (OCD) is a chronic disorder that often starts in childhood. The prevalence of OCD in childhood and adolescence has been estimated between 0.5% and 4% in epidemiological studies (Canals, Hernández Martínez, Cosi & Voltas, 2012; Costello et al., 1996; Flament et al., 1988; Heyman et al., 2001; Valleni-Basile et al., 1994; Zohar, 1999).

There is no consensus on the factors that explain OCD. However, some authors emphasized cognitive models as one of the most well articulated theoretical model for explaining OCD (Rachman, 1997; Salkovskis, 1999). Cognitive models suggest that people with OCD appraise the occurrence and content of their intrusions as significant, meaningful, and needing to be controlled (OCCWG, 1997; Rachman, 1997; Salkovskis, 1985). In cognitive models of OCD, specific dysfunctional beliefs are supposed to play a role in the negative appraisal of intrusive thoughts (Frost & Steketee, 2002). Cognitive behavioral model propose that specific types of obsessive beliefs may play role as risk factors for the development of different OCD symptoms (Tolin, Woods & Abramowitz, 2003). Six types of dysfunctional beliefs have been theoretically introduced to have a relationship with OCD symptoms (Clark, 2004; Frost & Steketee, 2002): (a) inflated personal responsibility (the belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes), (b) overestimating threat (the tendency to overestimating the occurrence of the negative events and believing that their occurrence is terrible), (c) perfectionism (the belief that mistakes are unacceptable), (d) intolerance of uncertainty (the belief that you should be completely certain that a negative event will not happen), (e) over-importance of thoughts (the belief that the mere presence of a thought means that thought is significant, or that merely thinking about a bad event will increase the probability of corresponding event including thought-action fusion beliefs; and (F) need to control intrusive thoughts (the belief that you should have complete control over your thoughts and it is possible).

In this regard, the Obsessive Compulsive Cognition Working Group (OCCWG) developed the "Obsessive Beliefs Questionnaire-87" (OBQ-87; OCCWG, 1997, 2001) to assess the core cognitive dimensions of OCD. This measure was later reduced to 44-items (OBQ-44; OCCWG, 2003, 2005) and is comprised of three correlated factors: a) the inflated responsibility and overestimation of threat (RT), b) the perfection and intolerance of uncertainty (PC) and c) the over-importance and need to control ones thoughts (ICT).

OC symptoms and obsessive beliefs in different studies

In several studies, OBQ has been used in regression analysis to predict OC symptoms. The following section summarized these findings.

Washing compulsions and contamination obsessions are strongly associated with inflated responsibility and threat estimation (Myers, Fisher& Wells , 2008; OCCWG, 2001, 2005; Taylor et al., 2010; Tolin, Brady& Hannan, 2008; Tolin et al., 2003; Wheaton, Abramowitz, Berman, Riemann & Hale, 2010). However, in other studies, washing compulsion was proposed as an attempt to achieve perfectionism (Myers et al., 2008; Wu & Carter, 2008; Summerfeldt, 2004). Nevertheless, Calamari et al., (2006) could not find any association between contamination symptoms and any obsessive beliefs among OCD patients.

Checking compulsion is related to perfectionism and intolerance of uncertainty in many studies (Abramowitz, Lackey &Wheaton, 2009; Julien et al., 2008; OCCWG, 2005; Tolin et al., 2003; Wu & Carter, 2008). Checking symptom is also related to responsibility and over estimation of threat (Myers et al., 2008; Taylor et al., 2010; Tolin et al., 2003; Wheaton et al., 2010). However, Tolin et al., (2008) could not find any relationship between checking symptom and any kind of obsessive beliefs in a clinical OCD samples.

Hoarding is expected to have a relationship with perfectionism / intolerance of uncertainty (Tolin et al., 2008). In some other studies hoarding has also shown to be associated with responsibility and threat estimation (Myers et al., 2008; Taylor et al., 2010; Tolin et al., 2003).

Mental neutralizing and obsessive symptoms, which involve religious, sexual, and violent obsessions along with neutralizing strategies (e.g., mental rituals, repeating, and simplistic behaviors), are related to the importance/control of thoughts (Abramowitz et al., 2009; Calamari et al., 2006; Julien, O'Connor, Aardema, & Todorov, 2006; Myers et al., 2008; Taylor et al., 2010; Tolin et al., 2008; Tolin et al., 2003; Viar, Bilsky, Armstrong & Olatunji, 2011; Wheaton et al., 2010). Furthermore, mental neutralizing and obsessive symptoms are also relating to responsibility / threat estimation beliefs (Myers et al., 2008; Taylor et al., 2010; Tolin et al., 2003).

Ordering / symmetry symptoms are expected to be associated with perfectionism and intolerance of uncertainty (Calamari et al., 2006; Frost & Steketee, 2002; Julien et al., 2008; Myers et al., 2008; OCCWG, 2005; Summerfeldt, 2008; Taylor et al., 2010; Tolin et al., 2003; Tolin et al., 2008; Viar et al., 2011; Wheaton et al., 2010; Woods, Tolin & Abramowitz, 2004; Wu & Carter, 2008). Taylor et al. (2010) found that ordering rituals are also predicted by responsibility and threat estimation. As mentioned earlier, there are inconclusive results as regards which obsessive beliefs are associated with OC symptoms.

TAF and obsessive compulsive symptoms among adolescents

Rachman (1993) suggested that OCD may be triggered by specific beliefs about the power and significance of thoughts. He called these kinds of beliefs as thought action fusion (TAF). This concept refers to the idea that (a) unwanted thoughts about unpleasant actions are equivalent to the actions themselves (moral TAF) and (b), thinking about unwanted event makes the event more probable (likelihood TAF).

Rachman, Thordarson, Shafran & Woody (1995) found an association between OC symptoms and TAF beliefs in a non-clinical adult sample. We could only find four major studies that examined the relationship between TAF beliefs and OCD symptoms in children and adolescents. Muris, Meesters, Rassin, Merckelbach & Campbell (2001) found that TAF was significantly associated with symptoms of OCD (r=0.34) among a non-clinical sample of adolescents aged 13–16 years. Similarly, Bolton, Dearsley,

Madronal-Luque & Baron-Cohen (2002) found a relationship between TAF beliefs and obsessive-compulsive thoughts (r=0.43) and behaviors (r=0.36) in a non-clinical sample of 127 children aged 5 to 17 years.

Barrett & Healy (2003) found higher ratings of TAF beliefs in children with OCD compared with non-clinical controls. In addition, Libby, Reynolds, Derisley & Clark (2004) found that young people with OCD obtained significantly higher scores on the TAF-likelihood-other scale than anxious and non-clinical adolescents. Nevertheless, none of these studies discusses which specific OC behavior is associated with TAF beliefs.

Although Reynolds & Reeves (2008), in their literature review, showed that cognitive models can be applied to children and adolescents, we could find only one study that examines the association between obsessive beliefs and OC symptom among non-clinical adolescents. Fonseca et al. (2009) in their study among Spanish adolescents could not find any particular relationship between MOCI subscales and obsessive beliefs measured by OBQ-44. Their regression analysis indicated that Perfectionism/Intolerance of uncertainty (PC) and Threat overestimation (T) were the unique predictors for obsessive-compulsive symptomatology. PC and T significantly predicted MOCI-total score and all of its four factors (checking, washing, doubting and slowness). In our study, we replicated their study with another self- report questionnaire that is especially designed for children and adolescents, and assesses more diversified OCD symptoms.

To summarize we have three objectives in this study. Firstly, we examined the relation between different OC symptom and obsessive beliefs. The independence of this relation is studied by controlling for depression. Secondly, we examined the contribution of obsessive beliefs, such as inflated responsibility/overestimation of threat (RT), perfectionism/ intolerance for uncertainty (PC), over importance of thoughts/ need to control thoughts (ICT) and thought action fusion (TAF) beliefs, in predicting OC symptoms among adolescents.

Method

Participants

The sample was obtained from the census of 2009 in the eighth and ninth grade from nine municipal state schools and state-subsidized private schools in Rubi (Barcelona, Spain). in total, 1,324 adolescents were invited to participate. On the day of assessment at schools, 307 students were absent, 43 students were not authorized by their parents, and 2 students did not show any interest in participating in this research. Due to the difficulties in understanding the language (Spanish), six students could not answer the questionnaires. Therefore, the final sample includes 966 students, 460 (47.6%) girls, and 506 (52.4%) boys. The age of the participants ranged between 13 to 16 years old, with a mean age of 13.89 years (SD = 0.074). In this study, 78.8% of participants were Spanish and 21.1% were non-Spanish. The participation ratio was 70%.

Procedure

Before beginning the research, we obtained the permission from Catalan Ministry of Education. After approving the research by the Ethics Committee in Human Experimentation and by the Research Committee of the authors' institution, the collaboration of all of the secondary schools located in Rubi, Barcelona, were requested. All of the nine schools accepted to participate in this study. Data collection was between 4 February and 15 June 2010. Signed consents were required from parents and oral consents by adolescents. During the assessment with the self-report questionnaires, two researchers were present in the classroom to answer possible questions about items. In this research, all questionnaires were applied in Spanish.

Instruments

Leyton Obsessional Inventory-child version (LOI-CV; Berg, Rapoport & Flament, 1986). This is a 20-item self-report questionnaire for assessing the presence of obsessive preoccupations and behaviors

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and rating the interference of each behavior in personal functioning. This measure comprises two subscales. Each item of the LOI-CV includes two responses: the presence/absence of the symptom described in the item (yes/no) and the interference of the symptom if it is present from zero (*no interference*) to three (*high interference*). The maximum score in this subscale is 60.

Canals Sans, Hernández Martínez, Cosi Muñoz, Lázaro García & Toro Trallero, (2011) in Spanish population obtained three factors that explained 46.30% of the variance. These factors were labeled Order/Checking/Pollution (OCP), Obsessive Concern (OC), and Superstition/ Mental Compulsion (SMC) (30.15%, 8.53% and 7.62% of the variance, respectively). The first factor contained seven items that referred to compulsive manifestations and obsessions around cleaning and ordering. The second factor contained seven items that referred to worries, and the third factor contained six items that referred to luck and numbers. In the present study we will rely on these factors to do the statistical analysis.

Obsessive Beliefs Questionnaire (OBQ-44; OCCWG, 2005). This is a 44-item measure assessing a range of belief domains that have been proposed as important in the etiology of OCD. The OCCWG found three factors as a result of analyzing the OBQ-87, and then retaining the 44 high loading items: 1) Responsibility/Threat estimation subscale (e.g., "Harmful events will happen unless I am very careful"), which includes 16 items that deal with cognitions relating to preventing harm from happening to oneself and others (RT); 2) Perfectionism/Certainty subscale (e.g., "I must be certain of my decisions"), which is comprised of 16 items, including high absolute standard of completion, rigidity, concern over mistake and feeling of uncertainty (PC); and 3) Importance/Control of thoughts subscale (e.g., "Having nasty thoughts means I am a terrible person"), which includes 12 items concerning the consequence of having intrusive thoughts or images, thought action fusion, and the need to get rid of intrusive thoughts (ICT).

Participants rate how much they agree with different beliefs on a 5-point Likert scale, ranging from 0 (disagree very much) to 4 (agree very much). This measurement has shown good validity, internal consistency, and test-retest reliability (OCCWG, 2005). A psychometric property of OBQ-44 has been

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examined in non-clinical Spanish adolescents by Fonseca et al. (2009) and it obtained a good psychometric property with the internal consistency ranging from 0.77 to 0.86.

Thought-Action Fusion Questionnaire for Adolescents (TAFQ-A; Muris et al., 2001). This measure consists of 15 brief vignettes that follows by an item. Eight of the items refer to the fusion of thoughts and action in terms of Morality (e.g., "You meet a classmate. Suddenly without any reason you think of a term of abuse for this person, having this thought is almost as bad as abusing this person"). Seven items pertain to the fusion of thoughts and action in terms of Likelihood. Each item had to be rated on a four- point Likert scale from 0 = "not at all true" to 3 = "very true".

In our study, we adopted the validated version of TAF-A among Spanish adolescents by Fernández-Llebrés, Godoy & Gavino (2010). In their study TAF-A showed a high internal consistency (Alpha between 0.86 and 0.90) and an acceptable temporal stability (interclass correlation between 0.63 and 0.68).

We eliminated one item from TAF (item 3: "You are alone in a church standing in front of a large statue of Jesus. Suddenly you have the thought of spitting on the statue, Having this thought is almost as bad as really spitting on the statue") because it contains a religious bias that may not have any scenario for Muslim students, as well as the secular ones.

Child Depression Inventory (CDI; Kovacs, 1992). This is one of the most widely used self-report questionnaires to assess the severity of depressive symptoms in 7 to 17 year-old children and adolescents. It includes 27 items in which the scores ranged between zero and two (total score ranges from 0 to 54). Children have to select the sentence from each group that best described themselves during the last 2 weeks. Good reliability (Alpha between 0.81 and 0.85) for this version was reported by Figueras, Amador-Campos, Gómez-Benito & del Barrio (2010) in the Spanish community and clinical population.

Screen for Child Anxiety Related Disorders (SCARED; Birmaher et al., 1997). This questionnaire assesses anxiety disorder symptoms in children and adolescents. It consists of 41 items that assess anxiety disorder symptoms according to DSM-IV criteria. SCARED has adequate internal consistency, test-retest stability and discriminative validity (Spence, 1998; Birmaher et al., 1997).

SCARED is validated and translated into Spanish by Domènech & Martinez (2008) in adolescent community sample and showed good psychometric properties.

Results

Internal consistency and descriptive statistics

Table 1 shows means, standard deviations and internal consistency coefficients (Cronbach's alpha) for subscales of LOI-CV, OBQ-44, TAF-A CDI, and SCARED total scores.

All of the measurements demonstrated good internal consistency. In LOI-CV, total scores of each of the subscales showed the best reliabilities (in the three factors, 0.77, 0.80 and 0.78 respectively), as it takes into account both the presence of OCD symptoms (yes score) and the interference of these symptoms. In OBQ, the alpha coefficient for all three subscales was between 0.83 and 0.87. TAF moral and likelihood also showed alpha coefficients of 0.86 and 0.87. CDI-total and SCARED-total also showed good internal consistency (0.83 and 0.84, respectively).

-Insert table 1-

Bivariate Pearson correlation

Table 2 shows the Bivariate Pearson correlations between each of lOI-CV subscales, TAF subscales, OBQ subscales, CDI-total, and SCARED-total. As can be seen, all three of the LOI-CV subscales had a significant association with each of the three OBQ subscales.

-Insert table 2-

Partial correlations

To examine the independence of the relationships between the theoretical variables and OC symptoms, we computed a series of partial correlations in which OBQ and TAF subscales were used to predict OC symptoms while controlling for CDI total score.

Table 3 displays the results, which indicate that even after controlling for CDI total score, the OBQ and TAF subscales still significantly predict OC symptoms. Moreover, controlling for CDI total score resulted in a reduction in the magnitude of the Pearson correlations among these variables.

-Insert table 3-

Regression analysis

To determine whether any of the OBQ subscales uniquely predicted OC symptoms, we fitted linear regressions for predicting the three LOI subscales from three OBQ subscales in all of the participants.

The results of the regression analyses predicting each LOI-CV subscale are summarized in the final step of each regression equation of Table 4.

LOI-Ordering/checking/pollution

The final model accounted for a significant proportion of the variance in LOI-Ordering/checking and pollution subscale scores ($R^{2\,adj.} = .120$), with SCARED total, OBQ-PC and CDI-total as significant predictors.

LOI- Obsessive concern

The final model accounted for a significant proportion of the variance in LOI-obsessing concern subscale scores ($R^{2adj.} = .301$), with SCARED-total, OBQ-PC and CDI-total as significant predictors.

The final model accounted for a significant proportion of the variance in LOI-superstition and mental compulsion subscale scores ($R^{2adj.}=.185$) with TAF-likelihood, SCARED-total, OBQ-PC and CDI-total being significant predictors.

-Insert table 4-

Discussion

According to the cognitive– behavioral OCD model (Rachman, 1997; Salkovskis, 1996) and Consistent with our hypotheses and with previous research (OCCWG, 2005; Tolin, et al., 2008; Tolin, et al., 2003; Viar, et al., 2011), obsessive beliefs were significantly associated with all of OC symptoms measured by LOI-CV.

To examine the independence of associations between obsessive beliefs and OC symptoms, we performed partial correlation analyses. Controlling for CDI total score reduced the magnitude of the Pearson correlations between these variables, and all of the correlations remained significant. The correlations between LOI-OC and OBQ-PC remained the strongest relations. In addition, LOI-SMC showed its strongest correlation with TAF-likelihood.

We have performed regression analyses without controlling for general distress (depression and anxiety). According to Taylor, et al. (2010), controlling for distress could produce an incorrect underestimation of the predictive power of the OBQ. If obsessive beliefs lead to OC symptoms, and OC symptoms then contribute to general distress, in these circumstances, the beliefs, as assessed by the OBQ, indirectly contribute to general distress. If this is the case, then taking out distress from OC symptom scores is equal to taking out some of the effects of the OBQ on OC symptoms. Our regression analysis revealed that perfectionism and intolerance of uncertainty (IU) accompanies depression and anxiety

symptoms predicting all of the LOI-CV subscales. Superstitions and mental compulsion symptom is also predicted by TAF- likelihood.

IU is defined as a cognitive bias that affects how a person perceives, interprets, and responds to uncertain situations by excessive worry and avoidance(Freeston, Rhéaume, Letarte, Dugas & Ladouceur, 1994). Such a person might believe that being uncertain about the future is unfair. IU plays a central role in the development and maintenance of excessive and uncontrollable worry (Laugesen, Dugas& Bukowski, 2003). In our study, among all of obsessive beliefs, OBQ-PC has the strongest correlation with SCARED total. Perfectionism as introduced by Hamachek (1978) includes two ends of the continuum: normal and neurotic. Neurotic perfectionists are characterized as having high levels of anxiety and a strong fear of failure. These people are unable to gain pleasure from their efforts because they are often unsatisfied with their accomplishment level. According to OCCWG, the cognitive process of perfectionism goes hand in hand with IU in OCD. It is because pursuing perfectionism is often due to the need to increase certainty about future outcomes that are experienced as uncertain and distressing (OCCWG, 1997). The latest finding (Reuther et al., 2013) confirms that the relation between perfectionism and OCD symptoms is completely mediating by IU.

In the present study, obsessive concern was predicted by perfectionism and intolerance of uncertainty beliefs. Obsessive concern in LOI does not measure any sexual or aggressive obsessions. It focuses more on indecisiveness, repeating thoughts and words, going over things several times, and troubles in finishing school works. As the mean age of our participants is around 13 years old, it seems reasonable that high perfectionism can predict indecisiveness and going over things a lot.

Mental compulsion and superstition beliefs were predicted by TAF-likelihood that indicates that merely thinking about an event may increase its probability. Thus, for preventing unpleasant events, the person may rely on some words, numbers, or other form of mental compulsions (e.g., repeating and

counting mentally) to keep bad luck away. Assuming the similarity between mental compulsion and neutralizing behavior, our result seems comparable Tolin et al. (2003) study.

OBQ-ICT covers some aspects of TAF likelihood concept (importance of thoughts). In our study, LOI-SMC is predicted by TAF-likelihood. Therefore, one might expect that LOI-SMC be also predicted by OBQ-ICT. However, in our study, we observed that LOI-SMC is not predicted by OBQ-ICT. This can be because the superstitious beliefs relate more to the importance given to the thoughts, rather than to the strategies uses to control them.

Ordering, checking, and contamination were predicted by perfectionism and intolerance of uncertainty. As three different OCD symptoms (Ordering/checking and contamination) loaded on the same factor, comparing our results to other studies is difficult. In general, our result is in the line with previous studies (Julien et al., 2008; Myers et al., 2008; OCCWG, 2005).

In this study, dysfunctional beliefs were strongly correlated with each other, ranging from 0.57 to 0.69. This is consistent with previous findings indicating a strong relationship between obsessive beliefs (OCCWG, 2005; Taylor et al., 2010). There are several possible reasons for such high correlations. One possibility that has been previously suggested is that these beliefs are correlated as they mutually influence each other (Frost & Steketee, 2002). Obsessive beliefs, in addition to putative direct effects on OC symptoms, are also said to have indirect effects, that is, beliefs interact with each other to influence OC symptoms. For example, a highly elevated sense of personal responsibility might strengthen beliefs about the need to act perfectly, and might reinforce beliefs about the importance of controlling one's unwanted thoughts (Frost & Steketee, 2002).

Limitations

Our study has several limitations. First, we could not compare some of our results with previous studies because we have applied different questionnaires that measure different dimensions of OC

symptoms. The dimensions of LOI-CV as a widely used questionnaire to assess obsessive-compulsive behavior among adolescents is hardly matched to well known questionnaires assessing OC symptoms in adults. Second, OBQ-44 is not an exhaustive measurement of the cognitive phenomena involved in OCD. Other suggested predicting constructs that are involved with obsessive-compulsive behavior are "not just right" feelings (Coles, Frost, Heimberg & Rhéaume, 2003), "experiential avoidance" (Eifert & Forsyth, 2005), "contamination specific cognitions" (Deacon & Olatunji, 2007), and "beliefs about rituals or stop signals" (Wells, 1997, 2000). Summerfeldt (2004) proposed that "not just right feelings" or a sense of incompleteness may underlie several types of obsessive and compulsive symptoms. Furthermore, meta-cognition aspects of information processing systems that monitor, interpret, and evaluate the content and process of cognition (Wells, 1997) are not adequately assessed in OBQ-44.

Although we have applied non-treatment seeking individuals, our findings can have implications for clinical interventions in children and adolescents with OC symptoms. The present results confirm that OC symptoms are relating to obsessive beliefs. Knowing the actual cognition that associate with OC symptom permits us to give accurate direction to the therapy.

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Table 1

Descriptive statistic and Alpha coefficients

	Mean	SD	Alpha
OBQ-PC	25.87	11.29	.87
OBQ-ICT	13.17	8.34	.83
OBQ-RT	25.34	11.13	.86
TAF-Moral	5.11	4.97	.86
TAF- likelihood	3.02	4.09	.87
LOI-OCP	3.72	1.66	.77
LOI-OC	3.72	1.83	.80
LOI-SMC	1.06	1.36	.78
CDI- total	11.25	6.28	.83
Scared- total	22.95	8.81	.84

Note.LOI =Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT =importance/ control of thoughts, TAF-likelihood =Thought Action Fusion- likelihood, TAF-Moral =Thought Action Fusion -Moral, CDI= Child Depression Inventory, SCARED= Screen for Child Anxiety Related Disorder

Table 2

Pearson correlation between LOI-CV, OBQ-44, TAF subscales, CDI, and SCARED total scores

	1	2	3	4	5	6	7	8	9	10
1. SCARED-total	1	.264**	.479**	.318**	.215**	.139**	.240**	.279**	.158**	.580**
2.LOI-OCP		1	.438**	.316**	.117**	.122**	.173**	.265**	.161**	.074*
3.LOI-OC			1	.386**	.212**	.150**	.296**	.352**	.203**	.397**
4.LOI-SMC				1	.306**	.155**	.204**	.242**	.195**	.281**
5.TAF-likelihood					1	.516**	.379**	.375**	.413**	.250**
6.TAF-Moral						1	.394**	.315**	.479**	.095**
7.OBQ-RT							1	.699**	.668**	.227**
8.OBQ-PC								1	.578**	.252**
9.OBQ-ICT									1	.179**
10.CDI-total										1

Note.LOI =Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution,

OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT =importance/ control of thoughts, TAF-

likelihood =Thought Action Fusion- likelihood, TAF-Moral =Thought Action Fusion- Moral, CDI= Child Depression Inventory, SCARED=

Screen for Child Anxiety Related Disorder

**p<0.01

* p<0.05

Table 3

Partial correlation between theoretical variables and OC symptoms

Theoretical variables	OC symptoms (LOI subscales)	Controlling for	Partial correlation
OBQ-RT	LOI-OC	CDI-total	.241**
OBQ-RT	LOI-SMC	CDI-total	.156**
OBQ-RT	LOI- OCP	CDI-total	.168**
OBQ-PC	LOI-OC	CDI-total	.280**
OBQ-PC	LOI-SMC	CDI-total	.197**
OBQ-PC	LOI-OCP	CDI-total	.254**
OBQ-ICT	LOI-SMC	CDI-total	.161**
OBQ-ICT	LOI-OCP	CDI-total	.148**
OBQ-ICT	LOI-OC	CDI-total	.145**
TAF-likelihood	LOI-SMC	CDI-total	.269**
TAF-likelihood	LOI-OCP	CDI-total	.112**
TAF-likelihood	LOI-OC	CDI-total	.120**
TAF-Moral	LOI-OCP	CDI-total	.107**
TAF-Moral	LOI-OC	CDI-total	.123**
TAF-Moral	LOI-SMC	CDI-total	.140**

Note.LOI= Leyton Obsessional Inventory, OC= Obsessive Concern, SMC=Superstition/Mental Compulsion, OCP= Ordering/Checking/Pollution, OBQ= Obsessive Beliefs Questionnaire, RT= responsibility/Threat, PC= perfectionism/uncertainty, ICT= importance/ control of thoughts, TAF-likelihood=Thought Action Fusion- likelihood, TAF-Moral= Thought Action Fusion- Moral, CDI= Child Depression Inventory, SCARED= Screen for child anxiety related disorder

** p<0.01

* p<0.05

Table 4

Summary of the statistics for the final step of regression equations predicting LOI-CV subscales in

high OC group

Criterion (Adj. R^2)	Predictors	B (IC95%)	β	P	F (p)
Predicting LOI-OC (.301)					127.274 (<.001)
	SCARED-total	0.069 (.055; .084)	.332	<.001	
	OBQ-PC	0.035 (.026; .045)	.217	<.001	
	CDI-total	0.047 (.028; .067)	.163	<.001	
Predicting LOI-OCP(.120)					40.964(<.001)
	SCARED-total	0.054(.039; .068)	.285	<.001	
	OBQ-PC	0.033(.023; .042)	.221	<.001	
	CDI-total	-0.036(-.056; -,016)	-.138	<.001	
Predicting LOI-SMC(.185)					50.870(<.001)
	TAF-likelihood	0.074(.052; .096)	.222	<.001	
	SCARED-total	0.030(.018; .041)	.192	<.001	
	OBQ-PC	0.011(.003; .019)	.094	.005	
	CDI-total	0.022(.006; .038)	.104	.006	

Note.LOI= Leyton Obsessional Inventory, OBQ= Obsessive Beliefs Questionnaire, RT=

responsibility/Threat, PC= perfectionism/uncertainty, ICT= importance/ control of thoughts, TAF-

likelihood= Thought Action Fusion_ likelihood, TAF-Moral= Thought Action Fusion- Moral, CDI=

Child Depression Inventory, SCARED= Screen for child anxiety related disorder

10.5. Appendix 5: Carta de aprobación emitida por la Comisión de Ética en la Experimentación Animal y Humana (CEEAH)

U//B
Universitat Autònoma de Barcelona
Vicerectorat d'Investigació

Comisión de Ética en la Experimentación Animal y Humana (CEEAH)

Universitat Autònoma de Barcelona
Edifici A
08193 Bellaterra (Cerdanyola del Vallès)

La Comisión de Ética en la Experimentación Animal y Humana (CEEAH) de la Universitat Autònoma de Barcelona, reunida el día 19/06/09, **acuerda informar favorablemente** el proyecto titulado **"Detecció precoç de trastorns d'ansietat i depressió en adolescents".** presentado por la **Dra. Edelmira Domenech**

Elaborado:	*Aprobado:*
Nombre: Núria Pérez Pastor Cargo: Secretària de la CEEA de la UAB Fecha:	Nombre: Josep Santaló Pedro Cargo: President de la CEEAH de la UAB Fecha:

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10.6. Appendix 6: Informe favorable de la comisión de la investigación

de la universidad Autónoma de Barcelona

U∎B
Universitat Autònoma de Barcelona
Àrea de Gestió de la Recerca

VISTIPLAU DE LA COMISSIÓ DE RECERCA DEL CENTRE

La Comissió d'Investigació d'aquesta Universitat informa favorablement el projecte que porta per títol **Detecció precoç de la depressió i trastorns d'ansietat en adolescents,** presentat per la Dra. Edelmira Domènech Llaberia adscrita al Departament de Psicologia clínica i de la salut i considera d'elevat interès el finançament del mateix.

Joan Gómez Pallarès
President de la Comissió d'Investigació

10.7. Appenedix 7: Carta de presentación para las familias y documento de consentimientos informada

Universitat Autònoma de Barcelona

Departament de Psicologia de la Salut
i de Psicologia Social

Benvinguts pares,

Des de la Unitat de Recerca de Psicopatologia del nen i de l'adolescent de la Universitat Autònoma de Barcelona, estem portant a terme una investigació sobre l'epidemiologia de problemes emocionals en adolescents de tercer i quart d'ESO de la ciutat de Rubí.

Els problemes emocionals són freqüents en adolescents, però no hi ha dades suficients i actuals sobre la seva prevalença en població no clínica i la seva repercussió en el rendiment escolar a aquesta edat. La detecció primerenca permet prevenir trastorns que poden prosseguir al llarg del desenvolupament.

Aquest estudi ja ha estat informat favorablement per les comissions d'Ètica i de Recerca del Rectorat de la UAB i té suport dels Serveis Territorials d'Educació del Vallès Occidental i l'autorització de l'Equip Directiu de la vostra Escola.

Li agrairíem molt que donés el seu permís per a que el seu fill pugui col·laborar, si ell ho accepta, en un estudi que el que pretén és lluitar contra el fracàs escolar i fer una prevenció de la depressió i trastorns d'ansietat en un futur. El treball té valor si col·laboren tots o quasi tots els estudiants d'aquesta edat de la població de Rubí.

Les dades són totalment confidencials i només es faran servir amb l'objectiu científic de la recerca o per avisar als pares en el cas de detectar alguna alteració.

En aquest curs, s'avaluaran els símptomes d'ansietat i depressió amb uns qüestionaris que s'apliquen dins de la classe. Després es passarà una entrevista individual a aquells adolescents que hagin donat més símptomes d'ansietat i depressió del que es considera acceptable per a la seva edat, així com a un grup a l'atzar que no hagi puntuat alt.

Alumne: _____

☐ Donem permís per la participació del nostre fill en aquest projecte (pare, mare o tutor)

☐ No donem permís per la participació del nostre fill en aquest projecte (pare, mare o tutor)

Si passat 8 dies no s'obté resposta, considerarem que vostès estan d'acord en la participació del seu fill/a en aquest estudi.

Molt atentament,

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