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[Differences in clinical intrusive thoughts between obsessive-compulsive disorder, generalized anxiety disorder, and hypochondria.](#)

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Abstract

Differences and similarities between intrusive thoughts typical of obsessive-compulsive disorder, generalized anxiety disorder, and hypochondriasis are relevant for their differential diagnosis, formulation and psychological treatment. Previous research in non-clinical samples pointed out the relevance of some process variables, such as responsibility, guilt, or neutralization strategies. This research is aimed to investigate the differences and similarities between clinical obsessions, worries and illness intrusions in some of these process variables. A second aim is to identify models based on these variables that could reliably differentiate between them. Three groups of patients with obsessive-compulsive disorder (n=35; 60% women, mean age 38.57), generalized anxiety disorder (n=36; 61.1% women, mean age 41.50), and hypochondriasis (n=34; 70.6% women, mean age 31.59) were evaluated using the Cognitive Intrusions Questionnaire – Transdiagnostic Version (Romero-Sanchiz, Nogueira-Arjona, Godoy-Ávila, Gavino-Lázaro, & Freeston, 2017). The results showed that some appraisals (e.g. responsibility or egodystonicity), emotions (e.g. guilt or insecurity), neutralization strategies and other variables (e.g. verbal content or trigger from body sensation) are relevant for the discrimination between obsessions, worries and illness intrusions. The results also showed three stable models based on these variables for the discrimination between these thoughts. The implication of these results in the diagnosis, formulation and psychological treatment of obsessive-compulsive disorder, generalized anxiety disorder, and hypochondriasis are discussed.

Keywords

Obsessions; worries; illness intrusions; obsessive-compulsive disorder; generalized anxiety disorder; hypochondriasis

Key Practitioner Message

- The current study provides evidence about the discrimination between clinical obsessions, worries and illness intrusions from a transdiagnostic perspective.
- The differentiation between them is crucial for the diagnosis, formulation and psychological treatment of obsessive-compulsive disorder, generalized anxiety disorder, and hypochondriasis.
- Appraisals such as responsibility or egodystonicity, emotions such as guilt or insecurity, and other variables such as frequency, neutralization strategies or verbal form were found relevant for the discrimination between these types of thoughts.
- Three stable binary logistic models including these variables were developed for the discrimination between these thoughts.

1. Introduction

Differences and similarities between intrusive thoughts typical of obsessive-compulsive disorder (OCD), generalized anxiety disorder (GAD), and hypochondriasis are relevant for both differential diagnosis and psychological treatment. Obsessions, worries and illness intrusions are part of the diagnostic criteria of those disorders and are crucial for the cognitive behavioural therapy applied to them. Furthermore, the processing of those thoughts is key in cognitive models of OCD, GAD or hypochondria. For instance, Salkovskis (1985), in his cognitive behavioural model of OCD, consider that the interpretation of responsibility for harm of intrusive thoughts are necessary to the development of OCD (Salkovskis & Millar, 2016). Also Dugas and colleagues (Dugas, Gagnon, Ladouceur, & Freeston, 1998; Dugas, Marchand, & Ladouceur, 2005) consider that the interpretation of worries as excessive or uncertain is crucial in their model of GAD, leading to excessive anxiety and counterproductive strategies, which contribute to the maintenance of the disorder. Finally, Warwick and Salkovskis (1990) place the misinterpretation of intrusions about illness (also of bodily sensations) at the centre of their model of hypochondriasis, leading to a series of behavioural, affective, cognitive and psychological reactions.

Some authors have studied the differences and similarities of different types intrusive thoughts using different versions of the Cognitive Intrusions Questionnaire originally developed within the context OCD (CIQ; Freeston, Ladouceur, Thibodeau, & Gagnon, 1991). In a series of studies in the early nineties, Freeston and colleagues investigated descriptive features of intrusive thoughts, the way they were appraised, and the emotions and cognitive and behavioural responses that were found in non-clinical samples (Freeston et al., 1994; Freeston, Ladouceur, Provencher, & Blais, 1995; Freeston et al., 1991; Freeston, Ladouceur, Thibodeau, & Gagnon, 1992; Freeston & Ladouceur, 1993).

Some years later, the same research group carried out two studies using within-subject methodology and non-clinical samples. In the first study (divided in two articles) they compared obsessions and worries (Langlois, Freeston, & Ladouceur, 2000a, 2000b) and in the second one they compared illness intrusions with obsessions and worries (Langlois, Ladouceur, Gosselin, & Freeston, 2004).

When comparing non-clinical obsessions and worries (Langlois et al., 2000a, 2000b), they found, among other results, that worries were more frequent and lasted longer, their content were appraised as more unpleasant, disturbing and egosyntonic, they interfered more in daily life, and they were perceived as more based in reality than obsessional intrusive thoughts. On the other hand, obsessions were more unwanted, uncontrollable and egodystonic, and the participants felt more responsible for their presence or their possible consequences. In addition, the individuals estimated that the seriousness of the consequences predicted by their obsessions were worse than those of their worries. They also found that worries were more frequently in verbal form, while obsessions were experienced more often as images. Findings about strategies in response to thoughts indicated that for both obsessions and worries, problem-focused strategies were related to the appraisals that the content has a basis in reality, and escape/avoidance strategies were related appraisals that the intrusion was egodystonic (Langlois et al., 2000b). However, there were subtle differences between both types of thoughts in the factor structure of the strategies: neutralization, that is “any voluntary, effortful cognitive or behavioural act that is directed at removing, preventing, or attenuating the thought or the associated discomfort” (Freeston & Ladouceur, 1997, p. 344), loaded as a problem-focused strategy for obsessions and as an escape/avoidance strategy for worries.

In the study of the comparison between illness intrusions, worries and obsessions (Langlois et al., 2004), the results were generally consistent with the above. However,

some differences between them were found. The results showed that, from a dimensional standpoint, illness intrusions fell between obsessions and worries on some characteristics such as frequency, feeling of insecurity and verbal or visual form. Further, illness intrusions created less feelings of responsibility if the thought were to become real, and less feelings of guilt for having the thought than for obsessions and worries. They also reported that appraisals of egodystonicity/egosyntonicity, disapproval and the extent to which the thought had a basis in reality discriminated between the obsessions, worries and illness intrusions. Finally, for illness intrusions, similarly to Langlois et al. (2000b), problem-focused strategies were more related to basis in reality and escape/avoidance strategies to the egodystonic nature of the thoughts. It is also important to note that neutralization loaded among the problem-focused strategies for illness intrusions.

Two related methodological issues should be highlighted. First, the studies described above were conducted on non-clinical samples and as Langlois et al. (2004) point out, people with a diagnosis of OCD, GAD or hypochondriasis may appraise their thoughts in a different manner. Second, although within-participant designs have been used extensively to compare thoughts of different types, Langlois et al. (2004) indicate the need of a between-participant methodology, especially in order to compare the different kind of thoughts that characterize the problems at a clinical level.

Since its initial development to investigate intrusive thoughts related to OCD, various versions of the CIQ have used to compare other kind of thoughts, such as depressive rumination and worry (Watkins, 2004; Watkins, Moulds, & Mackintosh, 2005) and rumination and obsessions (Wahl et al., 2011), the latter study on clinical samples. The CIQ has recently been extended to a transdiagnostic version (CIQ-TV) and validated including a wider range of variables associated with intrusive thoughts that may characterize a range of disorders, such as OCD, GAD, hypochondriasis, depression, social

phobia and some components of psychotic disorders (Romero-Sanchiz, Nogueira-Arjona, Godoy-Ávila, Gavino-Lázaro, & Freeston, 2017).

The aim of this study is to investigate the differences and similarities between obsessions, worries and illness intrusions. For this purpose, three groups of patients with OCD, GAD, and hypochondriasis were evaluated using the CIQ-TV. The first objective was to test whether variables that were found to differentiate between non-clinical obsessions, worries and illness intrusions would also differentiate between their clinical counterparts. The second objective was to identify models based on these variables that could reliably differentiate between the three types of thoughts.

The initial aims of the study are to replicate and extend the findings of the previous studies on non-clinical participants and within-participant methodology (Langlois et al., 2000a, 2000b, 2004) by using clinical samples and between participants. There are ten predictions based on these studies and there are two predictions based on items not used in the previous studies but added to the CIQ-TV.

Appraisals: 1) Obsessions will lead to stronger feelings of responsibility than worries if they were to become real, and worries more than illness intrusions. 2) Obsessions will provoke greater disapproval than both worries and illness intrusions. 3) Obsessions will be rated as more egodystonic than illness intrusions, and the latter more than worries. 4) Worries will be rated as more strongly based in reality than illness intrusions, and these more than obsessions.

Emotions: 5) Obsessions and worries will lead to greater feelings of guilt for having the thought than illness intrusions. 6) Worries will lead to greater feelings of insecurity than illness intrusions, and the latter more than obsessions.

Strategies: 7) Neutralization strategies will be used more frequently in response to obsessions than in response to worries or illness intrusions, as strategies where there is a functional link between the thought content and the strategy are more frequent in OCD than GAD (Ladouceur, Freeston, et al., 2000).

Other features: 8) worries will be more frequent than illness intrusions and those more than obsessions 9) Worries will be experienced in verbal form more than illness intrusions and those more than obsessions 10) Obsessions will be experienced in visual form more than illness intrusions and those more than worries.

The two hypotheses based on items that were included in the CIQ-TV (Romero-Sanchiz et al., 2017) were the following. The first one is that 11) worries will lead to stronger feelings of guilt for not having the thought (i.e. not worrying) than obsessions and illness intrusions given that positive beliefs about worry are frequent (e.g. couple of refs needed – one from Laval group, one from Wells). The final hypothesis is that 12) body stimuli will be reported to trigger illness intrusions more frequently than they trigger obsessions and worries based on cognitive models of hypochondria (Warwick & Salkovskis, 1990) or hypochondriasis. Differences between groups on the other items of the CIQ-TV will be examined and reported as supplementary material.

A second objective of this study will be to test the discriminant power of equations based on the same 12 variables between the three pairs of thought types: obsessions vs. worries, obsessions vs. illness intrusions, and worries vs. illness intrusions.

2. Method

2.1. Participants

Three groups of patients attending a mental health outpatient center of the Spanish National Health Service participated in this study. Thirty-five were diagnosed of OCD, 36 diagnosed of GAD, and 34 diagnosed of hypochondriasis (see Table 1). Two patients with a primary diagnosis of OCD had a secondary diagnosis of GAD and one of hypochondria. Three patients with a primary diagnosis of GAD had a secondary diagnosis of OCD. Five patients with a primary diagnosis of hypochondriasis had a secondary diagnosis of GAD. Patients with a severe psychiatric disorder in Axis I (alcohol/substances abuse or dependence, psychotic disorders, bipolar disorders, or dementia) were not included in the study.

//Please insert Table 1 here.//

2.2. Procedure

Recruitment and assessment took place in a mental health outpatient setting. Psychiatrists and psychologists asked their patients diagnosed of OCD, GAD or hypochondriasis whether they wished to participate in a research project about the assessment of their psychopathology. The participants of the research project received a thorough assessment by an experienced clinician and a structured, empirically supported psychological treatment for their psychopathology. All participants who agreed to take part in the study signed an informed consent form and were evaluated by the clinician (between 3 and 4 hours). The clinical diagnosis was confirmed using the Structured Clinical Interview for DSM-IV Axis I Disorders (First, Spitzer, Gibbon, & Williams, 2002). After that, the participants received from the clinician a booklet with a number of questionnaires relevant to different anxiety and mood disorders. The clinician reviewed the instructions for the questionnaires with the patient, and answered any questions. The

target thoughts reported in the CIQ-TV were checked by the clinician in order to ensure that they were typical of the presentation of the primary disorder that had been diagnosed, that is, an obsession in patients with a primary diagnosis of OCD, a worry in patients with a primary diagnosis of GAD and an illness intrusion in patients with a primary diagnosis of hypochondriasis, and were agreed as therapeutic targets. They were asked to complete the questionnaires at their home in a quiet environment. The research project was approved by the regional research and ethics committee and received regional funding (PI-211/2007).

2.3. Measures

2.3.1. Cognitive Intrusions Questionnaire (CIQ-TV; Romero-Sanchiz et al., 2017). The CIQ-TV has 79 items assessing different variables associated with the processing of intrusive thoughts across a wide range of disorders. In this questionnaire, the respondent is asked to indicate on a list which kind of thoughts they have had during the last month. Next, the respondent selects the most disturbing thought they have experienced during that period. Finally, the respondent is asked to rate 79 items about different variables associated with this thought on a 1 to 9 Likert scale. The items have the following structure: “How guilty does this thought make you feel?” or “If this thought really happened in your life, to what extent would you feel responsible?” This questionnaire does not generate total score; each item assesses a different construct relevant to models of intrusive thoughts. However, Romero-Sanchiz et al. (2017) examined its factor structure and obtained one factor for intrusiveness, four for appraisals (OCD, two for GAD, depression and social phobia), three for emotions (egosyntonic, egodystonic and guilt-related emotions), and two for strategies (thought-focused and problem-focused). Validity, Internal consistency and test-retest reliability of each factor

was established on a non-clinical Spanish sample and ranged from medium to very good (Romero-Sanchiz et al., 2017).

2.3.2. Obsessive Compulsive Inventory - Revised (OCI-R; Foa et al., 2002). This questionnaire has 18 items with three items on each of six subscales: washing, checking or doubts, obsessions, mental neutralization, arrangement and hoarding. Spanish version of this questionnaire confirmed the same 6-factors structure, and found a high internal consistency ($\alpha = .88$) and good test-retest ($r = .67$) reliability (Fullana et al., 2005).

2.3.3. Worry and Anxiety Questionnaire (WAQ; Dugas et al., 2001). Ten items corresponding to the DSM-IV (APA, 2000) criteria for GAD form this questionnaire. The patient rates each item on a 1 to 9 Likert scale, with higher scores for higher frequency or intensity. The Spanish version of the questionnaire has very good internal consistency ($\alpha = .91$) and test-retest reliability ($r = .80$) (Ibáñez Fernández et al., 2000).

2.3.4. Beck Depression Inventory-II (BDI; Beck, Steer, & Brown, 1996). This inventory has 21 multiple-choice items reflecting typical symptoms of depression. This scale has high internal consistency in both clinical and non-clinical samples ($\alpha = .93$ and $.92$) and good test-retest reliability ($r = .93$) (Beck et al., 1996). The Spanish version of the BDI has similar psychometric properties in both clinical (Sanz, García-Vera, Espinosa, Fortún, & Vázquez, 2005) and non-clinical samples (Sanz, Navarro, & Vázquez, 2003).

2.3.5. Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988). This questionnaire has 21 items of anxiety rated on a 4-point Likert scale. The BAI has an excellent internal consistency ($\alpha = .92$) and very good test-retest reliability ($r = .75$) (Beck et al., 1988) (Beck et al., 1988). The Spanish version of this questionnaire has equivalent psychometric properties (Magán, Sanz, & García-Vera, 2008).

2.3.6. Short Health Anxiety Inventory (S-HAI; Salkovskis, Rimes, Warwick, & Clark, 2002). The SHAI has 18 items which evaluate health anxiety, regardless of the health status of the person. The items assess worry about health, awareness of physical sensations or bodily changes, and feared consequences of having a disease. The S-HAI has shown good reliability, criterion validity and sensitivity to treatment (Salkovskis et al., 2002). The Spanish version of the questionnaire used for this research had excellent internal consistency ($\alpha = .91$) test-retest reliability (intraclass correlation coefficient = .86) (Romero-Sanchiz, Nogueira-Arjona, Gavino, & Godoy, 2008; Romero-Sanchiz, Nogueira-Arjona, Gavino, & Godoy, submitted for publication).

2.4. Data analysis

One-way ANOVAs, followed by Tukey's HSD (Games-Howell for unequal variance) will be used to compare groups. Bonferroni correction will be used in order to prevent type I errors; with 12 tests, results significant at $p < .05/12$ are indicated with a double asterisk in Table 1. In case of differences on age, gender, and measures of depression or anxiety (but not those expected between the groups), additional ANCOVA analyses will be performed.

Three binary logistic regression analyses will test whether the selected 12 variables are able to differentiate between each pair of thought types: obsessions vs. worries, obsessions vs. illness intrusions, and worries vs. illness intrusions. The Hosmer-Lemeshow statistic will be used as indicator of the goodness of fit for each logistic regression model. The discriminative power of each model will be evaluated by receiver operating characteristics (ROC) analysis evaluating the area under the curve (AUC). A p value inferior to 0.05 will be considered statistically significant. ROC curves and scatter dot plots showing the predictive probabilities of belonging to one diagnostic category or another will be plotted for each analysis.

Statistical analyses were performed using IBM SPSS Statistical version 22.0 (IBM, Armonk, NY, USA) and Graph-Pad Prism version 6.01 (GraphPad Software, San Diego, CA, USA).

3. Results

3.1. Preliminary Analyses

Table 1 shows that each group scored significantly higher on its corresponding measure than the two other groups. The most frequent subtype of OCD was contamination (42.9%), followed by checking (28.6%), sexual (14.3%) and others (14.3%). None of the target obsessions or worries reported by the patients were illness-related thoughts. Patients diagnosed with hypochondriasis were significantly younger than the other two groups. More GAD patients were diagnosed with a comorbid disorder (especially depression, 41.7%) with than the other groups. Also, GAD patients scored higher on depression than patients with hypochondriasis and OCD. Additional ANCOVA analyses

with age and depression as covariates were performed after the planned ANOVAs. Also, age and depression were included as covariates in the logistic regression analyses.

3.2. Comparisons of Intrusions across Groups

The results of the ANOVAs are shown in Table 2. There was partial support for the hypothesis about responsibility; OCD patients scored higher than the other two groups, but the difference between GAD and hypochondriasis patients was not statistically significant. As predicted, obsessions provoked more disapproval than worries and illness intrusions. The hypothesis about egodystonicity was partially supported as obsessions were more egodystonic than the other thoughts, but illness intrusions were not more egodystonic than worries. In the same way, the hypothesis about the thoughts' basis in reality was partially supported. Worries were considered more based in reality than the other thoughts, but illness intrusions were not considered more based in reality than obsessions. All differences for appraisals remained significant after Bonferroni correction.

//Please insert Table 2 here.//

The analyses of the items about emotions showed that OCD patients scored significantly higher than the other two samples on guilt for having the thoughts, partially support the hypothesis, which predicted that worries should also provoke more guilt than illness intrusions. Patients with GAD reported more guilt for not having the thought than the two other groups, fully supporting the hypotheses. Contrary to predictions, obsessions provoked more insecurity than illness intrusions. Further, there was no significant

difference between worries and the other thoughts on this variable. Only the final analysis did not remain statistically significant after Bonferroni correction ($p=0.005$, $p>.05/12$).

As predicted, OCD patients used neutralization strategies significantly more frequently than the other two samples. This comparison remained significant after Bonferroni correction.

Contrary to predictions, there was no significant difference between the frequency of obsessions and worries. However, the duration of obsessions and worries was longer than illness intrusions. The hypotheses about verbal and visual content of the thought received partial support. As expected, worries were significantly more verbal than obsessions, and obsessions were significantly more visual than worries. However, although illness intrusions did fall between them in both verbal and visual content, they were only significantly less verbal than worries and less visual than obsessions. Finally, as predicted, patients with hypochondriasis scored higher than the other two groups on the item “body sensation as a trigger”. All differences remained significant after Bonferroni correction except for verbal content.

3.3. ANCOVAs

Ten out of 12 differences remained significant after ANCOVAs controlling for group differences in age and depression; the differences in basis in reality and verbal presentation did not remain significant.

3.4. Discriminating between Groups

The first set of logistic regression analyses was carried out in order to discriminate between obsessions and worries. The analyses showed a stable model with a non-significant Hosmer-Lemeshow test (Chi-Square = 3.750; $df = 7$; $p = .808$): guilt, disapproval, neutralization strategies (higher in obsessions), guilt for not having the thought, and verbal content (higher in worries) were all significant predictors. The AUC was statistically significant (AUC = .985; $p < .001$; Fig. 1a), and a cut-off score of .498, (sensitivity was 97.22% and specificity was 94.29%). The means of the predictive probabilities of the model between obsessions and worries (Fig. 1b) were respectively 0.073 (SD=0.193) and 0.914 (SD=0.187). The differences between groups were statistically significant ($U=19.00$; $p<0.001$).

The second logistic regression analysis for obsessions and illness intrusions showed a stable model with a non-significant Hosmer-Lemeshow test (Chi-Square = 1.295; $df = 8$; $p = .996$). Guilt, responsibility, egodystonicity, neutralization strategies (higher in obsessions) and corporal stimuli as a trigger (higher in illness intrusions) remained as predictors. The AUC was statistically significant (AUC = .978; $p < .001$; Fig. 1c), and a cut-off score of .3342 (sensitivity = 100.0%; specificity = 88.57%). Regarding the predictive probabilities of the model between obsessions and illness intrusions (Fig. 1d), the mean predictive probabilities were respectively 0.112 (SD=0.240) and 0.885 (SD=0.186). The differences between both types of thoughts were statistically significant ($U=26.00$; $p<0.001$).

For worries and illness intrusions, the model was stable with a non-significant Hosmer-Lemeshow test (Chi-Square = 1.333; $df = 7$; $p = .998$). Only guilt, basis in reality (higher in worries), and body stimuli as a trigger (higher in illness intrusions) remained

as predictors. The AUC was statistically significant (AUC = .977; $p < .001$; Fig. 1e) and the cut-off score was .285 (sensitivity = 100%; specificity = 86.11%). The means of the predictive probabilities of the model between worries and illness intrusions (Fig. 1f) were respectively 0.118 (SD=0.248) and 0.876 (SD=0.192). The difference between both groups were statistically significant ($U=28.00$; $p<0.001$).

//Please, insert Figure 1 here.//

4. Conclusion and Discussion

The aim of this study was to compare aspects of the processing of intrusive thoughts among three groups of patients with OCD, GAD and hypochondriasis respectively. Most of the hypotheses were at least partially supported by the results. However, some discrepancies between these results and those obtained by Langlois et al. (2000a, b, 2004) using within-participant designs and non-clinical samples are worth discussing in detail. As stated in the introduction, it was expected that some of the results that they found in non-clinical samples were not replicated in clinical samples. Despite the relevance of analogue studies for clinical research is well established (Abramowitz et al., 2014), cognitive-behavioural models of psychopathologies (particularly anxiety-related disorders) assume that the difference between patients with a disorder and healthy subjects is not that the former do experience obsessions, worries or illness intrusions and the later do not, but the way in which patients process this type of thoughts.

With respect to appraisals, the results supported partially the hypothesis about responsibility. Given that responsibility is central to most cognitive models of OCD

(Obsessive Compulsive Cognitions Working Group, 1997; Rachman, 1997; Salkovskis et al., 2000) but not included in models of GAD (Behar, DiMarco, Hekler, Mohlman, & Staples, 2009; Romero-Sanchiz, Nogueira-Arjona, Godoy-Avila, Gavino-Lazaro, & Freeston, 2015) or hypochondria (Warwick & Salkovskis, 1990) this is not surprising. The results fully supported the hypothesis that obsessions would provoke more disapproval than the other thoughts. Despite the content of obsessions, worries or illness intrusions being unpleasant, the moral connotation of disapproval seems to be crucial in differentiating between obsessions and the other thoughts (Langlois et al., 2004). The hypotheses about egodystonicity and the basis in reality of the thoughts were partially supported by the results. As expected, obsessions were considered more egodystonic than worries and illness intrusions, and worries more based in reality than obsessions and illness intrusions (Langlois et al., 2000a, 2000b; Turner, Beidel, & Stanley, 1992; Wells & Morrison, 1994). However, contrary to Langlois et al.'s (2004) findings in a non-clinical sample, the mean scores for illness intrusions were not located between obsessions and worries, neither for egodystonicity, nor for basis in reality. Clinical illness intrusions seem to be as based in reality as obsessions (i.e. lower than GAD) and are as low on egodystonicity as worries. This means that egodystonicity and the basis in reality seem distinctive of obsessions and worries, respectively. However, an examination of the variance of the three groups of patients of both items warns against an oversimplified interpretation of the results: some of the patients with hypochondriasis might present more egodystonic thoughts than some patients with OCD (e.g. contamination obsessions might be less egodystonic than illness intrusions), and also some illness intrusions (e.g. the belief of having the same disease as a parent) might be rated as more based in reality than some worries (e.g. the overestimation of the likelihood plane crash when a loved one is on the plane). Despite some discrepancies about the role of egodystonicity as a

necessary ingredient in OCD (Audet, Aardema, & Moulding, 2016; Salkovskis & Millar, 2016) this result is coherent with those who consider it a useful construct (e.g. Clark & Purdon, 2016) and that obsessions might have both egodystonic and egosyntonic components (Purdon, Cripps, Faull, Joseph, & Rowa, 2007). These results also point out that both the egodystonicity-egosyntonicity continuum and basis in reality of the thoughts might be also considered in both the assessment and treatment of GAD and hypochondriasis.

For the hypotheses about emotions, the first about guilt for having the thought was partially supported. From a clinical point of view, these results are perhaps unsurprising. Despite some claims about the involvement of guilt in anxiety disorders in general (e.g. Fergus, Valentiner, McGrath, & Jencius, 2010), there is some evidence for its central role in OCD (Mancini & Gangemi, 2014; Rosen, 1975; Shapiro & Stewart, 2011), even from a neurobiological perspective (Hennig-Fast et al., 2015). The hypothesis about a different kind of guilt, guilt for not having the thought, was fully supported by the results. This difference was expected because this kind of guilt is related to positive beliefs about worries, one of the components of the cognitive model of GAD proposed by Dugas et al. (1998, 2005). Finally, the absence of differences in insecurity between the three samples (the only statistically significant difference was between obsessions and illness intrusions, but not after Bonferroni correction), might be due to that insecurity is an unspecific marker of clinical severity *or that insecurity has a different meaning in relation to clinical intrusions across disorders*. The three type of thoughts provoked high levels of insecurity in clinical samples, contrary to the findings in non-clinical participants which showed that worries provoked higher levels of insecurity than obsessions (Langlois et al., 2000a, 2000b, 2004), *which may reflect that the worries reflect concerns, albeit exaggerated or*

excessive, based in the lives of non-clinical participants whereas obsessions are typically about unusual or low frequency events.

The hypothesis about neutralization strategies was fully supported, and unsurprising, given that many compulsions are considered neutralization strategies (Freeston & Ladouceur, 1997; Rachman, Shafran, Mitchell, Trant, & Teachman, 1996).

The results did not support the hypothesis about frequency. Contrary to predictions based on previous results in non-clinical samples, clinical obsessions and worries were equally frequent and illness intrusions were less frequent than them. From a clinical perspective the lack of differences are perhaps unsurprising as some authors reported that one of the most important differences between non-clinical and clinical obsessions is their frequency (Abramowitz et al., 2014; Gibbs, 1996; Rachman, 1978; Salkovskis & Harrison, 1984) and obsessional intrusive thoughts may be a rarer and less frequent than worries in non-clinical samples, but obviously in clinical samples of OCD obsessions are present. It is less clear why illness intrusions should be less frequent other than the possibility that occurrence of illness intrusions may be dependent on current symptoms to trigger them, so that if symptoms are not present they may not be triggered; however this speculation only. Both hypotheses about verbal and visual presentation of the thoughts were partially supported. However, it is important to note that illness intrusions were as verbal and as visual as obsessions, which means that, in that respect, are closer to obsessions than to worries. This might be quite relevant to their differential diagnosis and to the use of some therapeutic techniques used for obsessions rather than those used for worries. Finally, the hypothesis about the body sensation as a trigger was fully supported which was unsurprising, given the inherent characteristics of hypochondriasis (Warwick & Salkovskis, 1990).

The differences remained largely significant even after stringent Bonferroni correction and after controlling for age and depression. It is likely that part of the variance associated with the differences between groups may have been removed when controlling for age and depression. In fact, despite the common use of ANCOVA for the control of possible confounding variables (i.e. Langlois et al. 2000b), Field (2011) among others do not recommend its use if the covariates vary as a function of the independent variable as well as of the dependent variable. So, some of the no longer significant differences after the ANCOVA might in fact be type II errors when “true” between groups variance has been removed.

The binomial logistic regression analyses showed three statistically significant models for the discrimination between obsessions and worries, obsessions and illness intrusions and worries and illness intrusions. Guilt remained as predictor in the three equations, which highlight its importance in the processing of these type of thoughts. High frequency of body stimuli as trigger seems to be particularly important on illness intrusions, since it is a key factor for their discrimination from both obsessions and worries. High frequency of neutralization strategies is important in the differentiation between obsessions and both worries and illness intrusions.

The results of this study indicate that despite shared characteristics, there are some features that can help to differentiate between obsessions, worries and illness intrusions. Interestingly, many of these features are not present in diagnostic criteria and consequently are not taken into account in differential diagnosis. However, statistically significant differences between three clinical groups on a variable does not mean that it should be a diagnostic criterion. Further, an examination of the means and standard deviations of the scores as well as the distributions of the predictive probabilities indicate overlap between the groups. The results of this study as well as those by Langlois et al.

(2004), Watkins, Moulds and Mackintosh (2005) and Wahl et al. (2011) indicate that the thoughts studied share many characteristics but differ in degree, so a dimensional perspective could enrich the research on intrusive thoughts across disorders and some variables may in fact indicate underlying transdiagnostic processes. These results may also support the importance of adopting a transdiagnostic perspective in the psychological treatment of these disorders. For instance, some strategies targeted to modify the estimation of the basis in reality of worries could be used in illness intrusions similar in that feature, or strategies used with obsessions could be implemented in psychotherapies of particularly egodystonic illness intrusions, or even worries. Despite the undoubted importance of well-validated single-disorder models for the understanding of disorders such as OCD, GAD, and hypochondriasis, the availability of a transdiagnostic perspective in the evaluation and treatment for some patients, perhaps with comorbid or non-prototypical presentations, might improve their prognosis.

Some of the limitations of this study are related to the single self-report measure used for the assessment of the key variables. The study relies on the understanding or the interpretation of the items by the patients. However, the subjectivity of a measure is not necessarily a flaw, given that emotions or most appraisals are subjective by nature, despite some occasional attempts to assess the construct using objective behavioural measures, for example for responsibility (e.g. Ladouceur et al., 1995) or intolerance of uncertainty (e.g. Ladouceur, Gosselin, & Dugas, 2000) or that some appraisals, such as egodystonicity or basis in reality might have an objective component (Audet et al., 2016). The main limitation of the study is the assessment of each construct by one item. Given the number of variables to be measured to operationalize information processing of intrusive thoughts across different disorders, an extensive battery would be needed, or a questionnaire which measured briefly all the variables. The first option probably may

allow a more reliable assessment of the variables, but the study would be very difficult in practical terms. Further, it may change the level of the measurement to more trait-like measures rather than appraisals of specific target thoughts. The second option (used here) enabled a large number of constructs to be measured without being overly long. The fact the constructs relate all to one target thought and one item measures each construct also allows greater focus. Further, the validation study of the CIQ-TV showed that this measure is both reliable and valid for the assessment of intrusive thoughts in relation to different measures of psychopathology, including symptom measures for OCD, GAD, depression or social anxiety (Romero-Sanchiz et al., 2017). Other potential limitations are related with the characteristics of the groups. Patients with GAD were more frequently diagnosed with a comorbid disorder, especially depression, and hypochondriasis patients were younger than the other two groups. We have tried to minimize the influence of these variables by statistical control.

As far as we know, this is the first study that compares obsessions, worries and illness intrusions in clinical samples and clarifies some of the more important differences. Indeed, combinations of variables lead to very high specificity and sensitivity in discriminating between the intrusions reported by the different diagnostic groups, especially between obsession and the other two types (all > 95%). This type of methodology could be used for the study of other kinds of thoughts using a dimensional perspective, such as thoughts associated with social anxiety, rumination in depressions, or even thoughts experienced in psychosis. Furthermore, other variables included in the CIQ-TV (but not found relevant in non-clinical studies), such as shame, duration of the thought, controllability of the thought or impulsivity might usefully be studied in other clinical samples.

The results of this study showed that clinical obsessions, worries and illness intrusions, despite sharing many characteristics, they also show differences in variables that could contribute to differential diagnosis beyond the content of the thoughts but may also reflect differences in underlying transdiagnostic processes.

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Table 1. Sociodemographic variables and psychopathology measures.

Measure	OCD (N= 35)	GAD (N= 36)	HYP (N=34)	F or χ^2	df	Differences
Mean age (SD)	38.57 (11.65)	41.50 (11.38)	31.59 (11.49)	6.80*	2	HYP<OCD,GAD
Women (%)	21 (60.0)	22 (61.1)	24 (70.6)	1.01	2	-
Marital status						
Married (%)	21 (60.0)	29 (80.0)	11 (32.4)	20.16*	6	-
Divorced (%)	0 (3,4)	2 (7,1)	2 (6,5)			
Single (%)	11 (31,4)	4 (11.1)	17 (50.00)			
Most frequent secondary diagnosis (%)	None 22 (62.9)	Depression 15 (41.7)	None 27 (79.4)	36.07*	12	-
Medication (%)	20 (57.1)	22 (61.1)	12 (35.3)	5.35	2	-
Measures						
OCI-R	45.85 (11.15)	33.46 (8.89)	33.44 (11.94)	15.24*	2	OCD>GAD,HYP
WAQ	59.59 (16.33)	68.86 (13.85)	54.76 (15.83)	7.56*	2	GAD>OCD,HYP
S-HAI	33.00 (8.78)	36.49 (6.71)	46.47 (9.82)	22.91*	2	HYP>OCD,GAD
BDI	17.21 (10.27)	22.80 (9.82)	12.59 (8.60)	9.81*	2	GAD>OCD,HYP
BAI	18.29 (14.21)	22.49 (12.48)	16.09 (11.99)	2.62	2	-

* $p < .001$; OCD = obsessive-compulsive disorder; GAD = generalized anxiety disorder; HYP = hypochondriasis; OCI-R = Obsessive Compulsive Inventory – Revised; WAQ = Worry and Anxiety Questionnaire; S-HAI = Short – Health Anxiety Inventory; BDI = Beck Depression Inventory; BAI = Beck Anxiety Inventory.

Table 2. ANOVA and ANCOVAs controlling for depression levels of the 12 items.

Item	OCD Mean (SD)	GAD Mean (SD)	HYP Mean (SD)	ANOVA		ANCOVA (controlling for BDI score and age)	
				F	Post hoc	F	Post hoc
Appraisals							
Responsibility if real	7.37 (2.63)	4.19 (3.22)	3.91 (2.84)	15.17**	OCD>GAD** OCD>HYP**	15.30**	OCD>GAD** OCD>HYP**
Disapproval	8.14 (1.85)	5.06 (3.09)	5.91 (2.62)	13.51**	OCD>HYP** OCD>GAD**	12.39**	OCD>HYP* OCD>GAD**
Egodystonicity	6.17 (3.05)	2.78 (2.83)	2.85 (2.48)	16.78**	OCD>HYP** OCD>GAD**	15.79**	OCD>GAD** OCD>HYP**
Basis in reality	6.00 (2.60)	7.42 (1.46)	5.62 (2.75)	5.84*	GAD>OCD* GAD>HYP*	2.60	-
Emotions							
Guilt	7.06 (2.53)	3.94 (2.90)	3.50 (2.58)	18.25**	OCD>GAD** OCD>HYP**	17.17**	OCD>GAD** OCD>HYP**
Guilt for not having it	2.71 (2.65)	4.64 (3.48)	1.85 (1.54)	9.86**	GAD>OCD* GAD>HYP**	4.52*	GAD>OCD* GAD>HYP*
Insecurity	7.71 (1.47)	7.08 (2.44)	6.06 (2.23)	5.50*	OCD>HYP*	4.26*	OCD>HYP*
Strategies							
Neutralization	8.03 (1.72)	3.39 (2.69)	4.47 (2.98)	32.80**	OCD>HYP** OCD>GAD**	31.85**	OCD>HYP** OCD>GAD**
Other							
Frequency	7.00 (1.53)	6.58 (2.17)	4.56 (2.60)	12.82**	OCD>HYP** GAD>HYP**	9.46**	OCD>HYP** GAD>HYP*
Verbal	4.57 (2.98)	7.00 (2.91)	4.94 (2.87)	7.13**	GAD>HYP* GAD>OCD*	3.00	-
Visual	7.23 (2.59)	3.28 (2.84)	6.41 (2.60)	21.51**	OCD>GAD** HYP>GAD**	19.60**	OCD>GAD** HYP>GAD**
Trigger from body sensation	4.46 (3.41)	3.11 (2.87)	7.21 (2.21)	18.30**	HYP>OCD** HYP>GAD**	17.75**	HYP>OCD** HYP>GAD** OCD>GAD*

* p< .05; ** p< .001; In bold, statistically significant differences after Bonferroni correction (p< .05/12 = .004); OCD = obsessive-compulsive disorder; GAD = generalized anxiety disorder; HYP = hypochondriasis; BDI = Beck Depression Inventory.