Université de Montréal

The Role of Dysfunctional Reasoning Processes in Relation to Feared Self-Perceptions, Obsessive-Compulsive Symptomatology and its Treatment

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Thèse présentée en vue de l'obtention du grade de Ph.D. en psychologie recherche et intervention, option clinique, sous la direction de Frederick Aardema, Ph.D.

Juillet, 2023

Résumé

Le trouble obsessionnel-compulsif (TOC) est une maladie psychiatrique hautement handicapante qui amène les patients à souffrir de pensées ou d'images intrusives récurrentes (obsessions) et à effectuer des comportements répétitifs (compulsions) qui visent à éliminer la détresse ressentie ou les conséquences redoutées des obsessions. Plusieurs études ont démontré que les processus de raisonnement mésadaptés (par ex. : « la confusion inférentielle ») et les perceptions envers le soi redouté (SR) auraient un rôle crucial dans le développement et le maintien du TOC. La confusion inférentielle a été démontrée comme étant un prédicteur unique des symptômes obsessionnels-compulsifs (OC) et a été démontrée comme étant spécifique au TOC. La confusion inférentielle se présente comme une confusion entre la réalité et une possibilité où la personne accorde une crédibilité aux inférences obsessionnelles sans toute évidence véritable dans le présent qui pourrait soutenir ces inférences. Cependant, les résultats concernant la confusion inférentielle et les symptômes OC ont principalement été étudiés à l'aide d'un seul questionnaire auto-rapporté, et un nombre limité d'études expérimentales a été mené avec des mesures alternatives pour établir la spécificité de la confusion inférentielle au TOC. Par ailleurs, les études envers la confusion inférentielle et sa relation avec les perceptions envers le SR demeurent limitées. De plus, les études antérieures se sont seulement attardées à un nombre limité des processus de raisonnement de la confusion inférentielle (par ex. : « le raisonnement inverse »), et n'ont pas couvert la gamme complète des processus de raisonnement qui ont été proposés comme étant pertinents au TOC.

Dans le cadre du premier article de thèse, une mesure novatrice axée sur la tâche, la Tâche des processus de raisonnement mésadaptés (TPRM), qui couvre une plus grande gamme des processus de raisonnement mésadaptés, a été développée et employée afin d'investiguer la relation entre la confusion inférentielle et les perceptions envers le SR avec les symptômes du TOC. 172

étudiants de premier cycle universitaire ont complété des versions informatisées de la TPRM et de mesures auto-rapportées associées. Les résultats ont démontré que les perceptions envers le SR et les croyances associées au TOC ont agi en tant que variables médiatrices séquentielles dans la relation entre la confusion inférentielle et les symptômes OC. Ainsi, les résultats démontrent que l'effet de la confusion inférentielle sur les symptômes OC est modulée par le SR de la personne ayant un TOC.

Le deuxième article de thèse démontre la relation entre les processus de raisonnement mésadaptés et les symptômes du TOC dans le cadre de deux études en employant la TPRM dans des échantillons cliniques. Dans la première étude, des participants ayant un TOC (n = 64), ainsi que des participants contrôles ayant un trouble anxieux (n = 30) et n'ayant aucun diagnostic (n = 34) ont complété la TPRM et des mesures associées. Dans la deuxième étude, 35 des participants ayant un TOC ont complété 16 séances de thérapie cognitive-comportementale (TCC) et ont complété les mêmes mesures après le traitement. Les résultats démontrent que le raisonnement mésadapté était significativement plus élevé pour ceux ayant un TOC que pour les participants contrôles. De plus, les améliorations dans les niveaux de raisonnement mésadapté suite à la TCC étaient significativement associées à la réussite thérapeutique.

En somme, les résultats de la présente thèse témoignent de la pertinence théorique et clinique de la confusion inférentielle et des perceptions envers le SR dans le développement et le maintien du TOC. Les résultats soutiennent la notion que la confusion inférentielle est un marqueur cognitif important et particulièrement pertinent dans le TOC qui doit être directement ciblé comme étant un mécanisme de changement dans la TCC.

Mots-clés : approche basée sur les inférences; confusion inférentielle; soi redouté; trouble obsessionnel-compulsif.

Abstract

Obsessive-compulsive disorder (OCD) is a highly disabling psychiatric illness which causes individuals to suffer from recurrent intrusive thoughts or images (obsessions) and engage in repetitive behaviors (compulsions) aimed at eliminating distress or feared consequences of the obsessions. Previous research has highlighted the role of dysfunctional reasoning (i.e. "inferential confusion") and feared self-perceptions in the development and maintenance of OCD. Inferential confusion has previously been found to be a unique predictor of OC symptoms and has shown specificity for OCD. Inferential confusion presents a confusion between reality and possibility where the person gives credibility to obsessional inferences without any actual evidence in the here now supporting these inferences. However, findings regarding inferential confusion and OC symptoms have primarily relied on a single self-report questionnaire, and only a limited number of experimental studies have been conducted to establish the specificity of inferential confusion to OCD with alternate measures. Furthermore, investigations into inferential confusion in relation to feared self-perceptions remain scarce. Also, previous investigations only pertain to a limited number of reasoning processes in inferential confusion (i.e. inverse reasoning) and fail to cover the entire spectrum of processes proposed to be relevant to OCD.

In the first thesis article, a novel task-based measure, the Dysfunctional Reasoning Processes Task (DRPT), covering a wider range of dysfunctional processes, was developed and used to investigate the relationship of inferential confusion with feared self-perceptions and symptoms of OCD. 172 undergraduate students completed computerized versions of the DRPT and self-report measures. Results showed that feared self-perceptions and obsessive-compulsive (OC)-related beliefs sequentially mediated the relationship between inferential confusion and OC

symptoms. Hence, our findings show that the effect of inferential confusion on OC symptoms is modulated by the person's feared self.

The second thesis article demonstrates the relationship of dysfunctional reasoning processes with OCD symptoms in two studies by using the DRPT in clinical samples. In the first study, sixty-four participants diagnosed with OCD, as well as thirty anxious and thirty-four healthy controls completed the DRPT and related measures. In the second study, thirty-five OCD participants completed sixteen sessions of cognitive-behavioural therapy (CBT) and completed the same measures post-treatment. Findings demonstrated that dysfunctional reasoning was significantly more elevated for those with OCD relative to control groups. Furthermore, reduced levels of dysfunctional reasoning following CBT were significantly associated with successful treatment outcome.

Overall, the results of the present thesis suggest the theoretical and clinical relevance of inferential confusion and feared self-perceptions in the development and maintenance of OCD. Findings support the notion that inferential confusion is an important cognitive marker particularly relevant to OCD that needs to be directly addressed as a mechanism of change in CBT.

Keywords: Inference-based approach; inferential confusion; fear of self; obsessive-compulsive disorder.

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List of Abbreviations

ANCOVA = analysis of covariance

ANOVA = analysis of variance

APA = American Psychiatric Association

BAI = Beck Anxiety Inventory

BDI-II = Beck Depression Inventory – II

CBT = Cognitive-Behavioural Therapy

CIHR = Canadian Institutes of Health Research

COVID = Coronavirus disease

CR-IUSMM = Centre de recherche de l'Institut universitaire en santé mentale de Montréal

D-Dep = Depression, Anxiety and Stress Scales – 21-item version, Depression scale only

DIAMOND = Diagnostic Interview for Anxiety, Mood and Obsessive-Compulsive and Related Neuropsychiatric Disorders

DRPT = Dysfunctional Reasoning Processes Task

DSM = Diagnostic and Statistical Manual of Mental Disorders

ERP = Exposure and Response Prevention Therapy

FRQS = Fonds de recherche du Québec – Santé

FSQ = Fear of Self Questionnaire

IBA = Inferenced-Based Approach

I-CBT = Inferenced-based Cognitive-Behavioural Therapy

ICQ = Inferential Confusion Questionnaire

ICQ-EV = Inferential Confusion Questionnaire – Expanded Version

IRT = Inverse Reasoning Task

MUIRC = Montreal University Institute Research Center

OBQ = Obsessive Beliefs Questionnaire

OC = Obsessive-Compulsive

OCCWG = Obsessive-Compulsive Cognitions Working Group

OCD = Obsessive-Compulsive Disorder

OCD-RL = Obsessive-Compulsive Disorder Research Laboratory

OCD-S = Dysfunctional Reasoning Processes Task, OCD scenarios only

N-OCD = Dysfunctional Reasoning Processes Task, Non-OCD scenarios only

RCT = randomized control trial

SCID-5-RV = Structured Clinical Interview for DSM-5 Disorders

VOCI = Vancouver Obsessional-Compulsive Inventory

Y-BOCS = Yale-Brown Obsessive-Compulsive Scale

Acknowledgements

First and foremost, I want to thank my supervisor, Frederick Aardema, without whom my academic and professional path in psychology would have been drastically different. We first met at the CR-IUSMM during the second year of my bachelor's degree in psychology in the fall of 2016. Fred took a chance on me by offering me various research and mentoring opportunities. I truly cannot express in words how grateful I am that our paths crossed and that he elected to mentor me. I can only speak fondly of him. As a researcher, your genuine passion and devotion towards improving treatment for those with OCD and related disorders is truly inspiring. As a supervisor, I particularly appreciated how available and caring you were in guiding me in the right direction. And as a person, I am thankful to have met someone who inspires me to be passionate, creative, dependable and attentive to the needs of others. You have had an impact on me that has forged my critical thinking and helped shape my identity as a clinician. Thank you for your time, but most especially, thank you for your trust.

J'aimerais offrir mes remerciements les plus sincères aux plus de 300 participants qui ont contribué à ma thèse doctorale. Sans leur générosité, ce projet n'aurait tout simplement pas été achevé. Merci aux nombreuses personnes qui m'ont fait confiance avec leur souffrance et qui ont su livrer des témoignages poignants sur leurs difficultés. Je vous remercie humblement.

J'aimerais remercier toute l'équipe du LRTOC sans qui mon projet n'aurait pas pu avoir lieu. D'abord, merci à Natalia Koszegi et à Kieron O'Connor de m'avoir recruté en 2016. Sans vous, je n'aurais pas développé une passion pour le TOC, je n'aurais pas rencontré mon superviseur, et mon parcours en psychologie aurait vraiment été tout autre. Votre expérience en recherche, mais plus particulièrement, votre expérience et votre finesse en tant que cliniciens, m'ont fortement inspiré pour ma pratique clinique à venir. J'aimerais également souligner le

travail de Lysandre Bourguignon, ma grande complice au quotidien au LRTOC, qui a grandement contribué à mon projet en tant que coordonnatrice du laboratoire, mais aussi en tant que co-auteure dans mon deuxième article de thèse. Merci également à Jean-Sébastien Audet pour nos nombreuses discussions sur le TOC et sur l'IBA au fil des années.

I would like to thank my colleagues and co-authors Shiu F. Wong and Adam Radomsky who contributed immensely to my thesis project. Your involvement, feedback and advice were crucial and I am thankful for your collaboration.

Merci aux *Fonds de recherche du Québec – Santé*, et aux *Instituts de recherche en santé du Canada*, d'avoir cru en mon projet et pour leur soutien financier, ce qui m'a apporté une certaine tranquillité d'esprit durant mon parcours.

J'aimerais remercier mes clients à la Clinique universitaire de psychologie (CUP) du département de psychologie de l'Université de Montréal. S'ouvrir à un étranger demande une grande confiance, une certaine vulnérabilité, et du courage. Je me souviendrai de chacun d'entre vous, tous pour des motifs différents, mais surtout pour les liens tissés entre nous. Merci de m'avoir fait grandir en tant que clinicien et en tant qu'être humain. À la CUP, j'aimerais remercier mes superviseurs, soit Jean Gagnon, Danielle Amado, Christopher Earls et Geneviève Pilon. Bien que vos approches et vos styles personnels étaient hétérogènes, vous m'avez tous appris à être authentique, bienveillant, empathique, attentif et patient envers le rythme des clients. À chacun votre façon, vous m'avez permis d'explorer mon identité personnelle et professionnelle dans un cadre sécuritaire, et m'avez permis de me questionner et de repousser les limites de mon introspection. Mes expériences cliniques de stage ont grandement contribué à l'aspect clinique de ma thèse et aux interactions avec mes participants. Je vous remercie pour votre confiance.

Sans ordre particulier, merci à mes grandes complices durant le parcours au PhD, sans qui j'aurais eu l'impression d'être seul au monde dans un univers complexe, étranger, angoissant et terrifiant. Félicia, pour notre complicité au quotidien durant plusieurs moments exaspérants du programme, mais aussi pour les moments joyeux qui nous confirmaient que nous étions à la bonne place. Julie, pour notre complicité dans nos expériences au CR-IUSMM, dans la difficulté d'arriver au bout de nos programmes respectifs et pour nos longues soirées à discuter de l'après-PhD. Vanessa, pour ta sensibilité et ta générosité, pour nos discussions profondes qui poussent ma réflexion personnelle sur notre existence au-delà de l'identité de psy. Lauranne, pour ta présence physique et émotionnelle durant la COVID, particulièrement à la CUP, puisqu'être en présence d'autrui était une rare commodité. Merci aussi à ma grande complice du baccalauréat en psychologie, Tamara, qui m'a poussé à persévérer jusqu'au PhD.

Merci à mes parents, Louise et Pierre, et à ma sœur, Amélie, pour leur soutien et qui m'ont tant donné. Vous avez été là pour moi durant les moments clés, tant ceux de célébrations que les plus difficiles. Vous avez eu un impact concret même sur ma thèse en me référant des participants potentiels. Je vous remercie et vous aime profondément.

Enfin, merci à tous mes amis et anciens collègues qui, de proche ou de loin, ont eu un impact sur moi, qui m'ont soutenu dans mes projets au fil des années et qui m'ont amené à changer de domaine. L'idée de changer de carrière à 28 ans après avoir déjà complété un baccalauréat et une maîtrise, puis recommencer à zéro dans un nouveau domaine et faire huit ans supplémentaires d'études universitaires à temps plein, cela m'a fait peur. Cependant, je confirme aujourd'hui que cette décision était la meilleure que j'aie prise de toute ma vie. Si vous êtes malheureux dans votre domaine, il n'est jamais trop tard pour vous réorienter.

General Introduction

The present thesis is comprised of two research articles that describe the findings of three studies investigating the role of dysfunctional reasoning processes (i.e. "inferential confusion") and feared self-perceptions in the development and maintenance of obsessive-compulsive disorder (OCD). Inferential confusion presents a confusion between reality and possibility where the person gives credibility to obsessional inferences without any actual evidence in the here now supporting these inferences. Specifically, this thesis examines inferential confusion and feared self-perceptions in OCD per the Inference-Based Approach (IBA; O'Connor & Robillard, 1995, 1999), a cognitive etiological and theoretical model of OCD. Previous investigations into inferential confusion and feared self-perceptions have primarily relied on self-report measures, and experimental investigations are scarce, especially in relation to the specificity of inferential confusion to OCD as well as its treatment outcome. Also, previous investigations only pertain to a limited number of reasoning processes and fail to cover the entire spectrum of processes proposed to be relevant to OCD. The present thesis aimed to 1) investigate the relationship between inferential confusion, feared self-perceptions, and obsessive-compulsive (OC) symptomatology by using a methodology that covers a wider range of dysfunctional reasoning processes proposed to be relevant in OCD, 2) examine the theoretical and clinical relevance of inferential confusion to OCD relative to other psychopathologies, and 3) investigate the relationship between improvements in dysfunctional reasoning with treatment outcome among those with OCD.

Obsessive-Compulsive Disorder

OCD is a highly disabling psychiatric illness which causes individuals to suffer from recurrent intrusive thoughts or images (obsessions) and engage in repetitive behaviors (compulsions) aimed at eliminating distress or feared consequences of the obsessions (American

Psychiatric Association [APA], 2013; Overduin & Furnham, 2012). OCD has a lifetime prevalence estimated at about 2% worldwide (Banerjee, 2020; Weisman et al., 1994). OC symptoms are also present in the general population, with up to 25% of individuals who may experience OC symptoms without OCD diagnosis at a subclinical level (Fullana et al., 2009).

Diagnostic Considerations. The feature symptoms of OCD are obsessions and compulsions. Obsessions typically take the form of either thoughts, images, urges or impulses, and compulsions are performed to reduce the distress that is triggered by obsessions or to prevent a feared event (Stein et al., 2019; Swinson, Antony, Rachman, & Richter, 2001). Neither obsessions nor compulsions are experienced as pleasurable, although temporary relief may be experienced following the completion of compulsions. The DSM-5 also allows for the OCD diagnosis of individuals who may only experience obsessions or compulsions. It is estimated that 25% of OCD patients may experience obsessions without overt compulsions (McKay et al., 2004).

The frequency and severity of OCD symptoms may vary, but the majority of patients find their symptoms to be time-consuming (Hezel & Simpson, 2019; Swinson et al., 2001). According to DSM-5 criteria, symptoms may be only be present for a little more than "one hour per day" for a diagnosis of OCD to be applicable, but those with severe symptoms may experience symptoms nearly constantly (APA, 2013).

The average age of onset of OCD is 19.5 years (Ruscio, Stein, Chiu, & Kessler, 2010). For many, OCD begins during adolescence, with up to 25% of cases that start at the age of 14, while onset after 35 years is uncommon (APA, 2013). OCD typically causes significant impairment in all areas of life with a chronic course (Koran, Thienemann, & Davenport, 1996; Markarian et al., 2010; Ruscio et al., 2010). Further, those with OCD may spend an average of 8.9 years of their lives with the disorder until finding treatment (Ruscio et al., 2010), accentuating the need for

effective assessment as well as early treatment. Sensitive, valid and reliable instruments are thus required to accurately measure symptom severity and to further advance OCD research (Anholt et al., 2009). However, measurement of symptoms remains complex due to heterogeneity and comorbidity with other disorders, such as depression, with up to 30% comorbidity, and anxiety disorders with up to 70% comorbidity (Banerjee, 2020; Clark, 2004; Swinson et al., 2001).

OCD Symptoms and Subtypes. The specific content of obsessions and compulsions varies between individuals, and those with OCD typically experience multiple symptom types (Abramowitz et al., 2010; Swinson et al., 2001). It is estimated that up to 60% of OCD patients may have more than one type of obsession, and up to 40% may have more than one type of compulsion (Rasmussen & Tsuang, 1986; Rowsell & Francis, 2015). Research findings show that OCD may be subdivided into common symptom domains (APA, 2013), with symptoms listed in the clinician-administered Yale-Brown Obsessive-Compulsive Scale (Y-BOCS; Goodman et al., 1989) as the most accepted in research allowing for the comparison of international data from different studies (McKay et al., 2004; Storch et al., 2010; Swinson et al., 2001). Indeed, there is an ever-growing majority of OCD treatment outcome studies that has used the Y-BOCS as a primary research outcome instrument (Storch et al., 2010). The four principal symptom domains of OCD include 1) contamination (or washing), 2) checking, 3) unacceptable thoughts, and 4) just right (i.e. perfectionism, exactness, indecisiveness, counting, symmetry, ordering and arranging (Moulding, Aardema, & O'Connor, 2014; Swinson et al., 2001; Thordarson et al., 2004).

Those with contamination symptoms typically engage in rituals pertaining to hygiene, such as cleaning or washing objects, surfaces or themselves, due to feeling contaminated or by fear of spreading contamination to others (Feinstein, Fallon, Petkova, & Liebowitz, 2003). Checking symptoms are the most heterogeneous in content among OCD subtypes (Swinson et al., 2001).

Obsessions experienced by checkers may reflect content related to harm (e.g. security, fire, food, disaster), where the OCD patient will check repeatedly to reduce distress regarding a feared consequence (Cervin et al., 2022; Sookman & Pinard, 2002). Third, unacceptable thoughts (or repugnant obsessions) may relate to themes of harm, violence, sexuality, religion and immorality (Moulding et al., 2014; Swinson et al., 2001). Patients who experience these typically appraise them as dangerous and attempt to exert a high level of control over them by performing physical or mental rituals to neutralize them (Aardema, Wu, Moulding, Audet, & Baraby, 2018; Obsessive Compulsive Cognitions Working Group [OCCWG], 2001). Patients with these symptoms are prone to experiencing feelings of shame and guilt and may outright fear reporting them to others (Newth & Rachman, 2001). Finally, just right symptoms are also highly heterogenous in content. The overarching theme in just right intrusions is the feeling to perform physical or mental actions until one has the feeling of certainty that said actions are "just right" to avoid harmful outcomes (Calamari, Wiegartz, & Janeck, 1999; Swinson et al., 2001; Stein et al., 2019).

Psychopharmacological Treatments for OCD. Several evidence-based guidelines recommend serotonergic antidepressants, such as selective serotonin reuptake inhibitors (SSRIs) and clomipramine, as first-line pharmacological treatments for OCD (Hadi, Kashefinejad, Kamalzadeh, Hoobehfekr, & Shalbafan, 2021). However, up to 60% of patients receiving such strategies show partial or no improvement, and few experience complete remission from initial monotherapy (Goodman, Storch, & Sheth, 2021; Hadi et al., 2021; Pellegrini et al., 2022). Furthermore, anxiety disorders and OCD often co-occur (Noyes Jr., 2001), posing further challenges in the study of the efficacy of these medications for OCD (Williams, Stein, & Ipser, 2018).

Beyond serotonin reuptake inhibitor medications, there has been some empirical support for atypical antipsychotic augmentation, but our incomplete understanding of the neurobiology of OCD has limited the impacts of available interventions (Goodman et al., 2021). The literature on antipsychotic augmentation contains significant methodological limitations, such as small sample sizes and varying degree of SSRI treatment resistance (Reddy, Sundar, Narayanaswamy, & Math, 2017). Despite that antipsychotic agents are currently not officially approved for the treatment of OCD, their addition is often considered as a strategy for those who do not respond to first-line treatment (Van Ameringen et al., 2014).

Goodman et al. (2021) suggest that despite multiple studies supporting preferential efficacy of SSRIs based on randomized clinical trials comparing SSRIs and clomipramine to placebo, direct support for serotonergic abnormalities in the pathophysiology of OCD is lacking. Recent evidence from multiple studies points to the dysfunction of the glutamatergic system in OCD with increased activity in brain regions that form a cortico-striato-thalamo-cortical (CSTC) loop (Hadi et al., 2021). A meta-analysis by Hadi et al. (2021) reviewed 17 studies with a total number of 759 patients with OCD and found that augmentation of glutamatergic medications with SSRIs were beneficial in OCD patients and superior to SSRI with placebo. Finally, neuromodulation treatments with non-invasive devices, such as transcranial magnetic stimulation, have also provided support for the CSTC loop model of OCD (Pellegrini et al., 2022).

Despite the findings above, evidence-based clinical practice continues to usually consist of combining SSRI treatment with Cognitive-Behavioural Therapy (CBT; Del Casale et al., 2019). SSRIs are recommended for at least eight to 12 weeks before evaluating treatment response (Koran & Simpson, 2013). In a study evaluating nine international OCD treatment centers (Van Ameringen et al., 2014), 50% of 361 participants reported use of at least one augmentation

strategy: 30% were prescribed antipsychotics such as risperidone, 24.9% were prescribed benzodiazepines due to the high comorbidity of OCD with anxiety, and 21.9% were prescribed a second SSRI. In this same study, while augmentation strategies were widely used, results suggested that augmentation strategies provided little to no therapeutic benefit in those who did not respond to first-line treatments for OCD. Finally, findings by meta-analytic and randomized controlled trials support that combination treatment consisting of CBT and pharmacotherapy is superior to SSRI monotherapy, especially for treatment-resistant and severe OCD patients (Foa et al., 2005; Simpson, Huppert, Petkova, Foa, & Liebowitz, 2006; Skapinakis et al., 2016).

Cognitive and Behavioural Model Formulations of OCD

A number of different models have been proposed for OCD, including behavioural models, but also formulations that include the role of cognitions in its development and maintenance. While a variety of different behavioural and cognitive models exist, emphasizing different behavioural and cognitive aspects of this disorder, they can broadly be divided into purely behavioural models, appraisal-based formulations, and inference-based conceptualizations of OCD.

Behavioural Models. As noted by Himle and Franklin (2009), behavioural models conceptualize the origin of OCD as an association between a thought and a stimuli that causes distress, which leads to the thought being associated to the distress and the thought ultimately being transformed into an obsession. The anxiety that has been conditioned to the thought is subsequently neutralized by a compulsion, which leads the person to never become habituated to the experienced distress. Hence, when the person performs a compulsion in reaction to a benign thought, this person eventually develops OCD (Himle & Franklin, 2009).

Until the 1960s, OCD was traditionally seen as extremely resistant or uncurable, as psychoanalytic and psychodynamic models had not produced treatments that could significantly

reduce symptoms or lead to complete resolution (Foa, 2010). Several behavioural approaches were then tested and applied in the treatment of OCD, such as systematic desensitization (Wolpe, 1969) and aversion therapy (Mastellone, 1974), but both met with limited success (Lam & Steketee, 2001). The first breakthrough in successfully treating OCD patients was provided by Meyer (1966) who described patients who were treated by a form of behavioural therapy that exposed them to distressing stimuli and prevented them from performing rituals.

Exposure and Response Prevention (ERP) is the most frequently-used behavioural treatment for OCD and the most researched psychological treatment for OCD since the 1960s (Himle & Franklin, 2009). This treatment may refer to a collection of techniques and specific program components may vary (Foa, Steketee, & Grayson, 1985; Meyer, Levy, & Schnurer, 1974). ERP is based on the premise that systematic exposition to the stimuli that is associated to obsessional thoughts and distress whilst being prevented from neutralizing the distress (i.e. performing compulsions), the person will see an alleviation of distress over time due to extinction (Meyer, 1966). The ERP therapist develops and then follows a treatment plan with the OCD client for graded, sequential confrontation of the stimuli that is associated with distress (Himle & Franklin, 2009; Tolin, 2009). Hence, ERP is deemed successful once the person has become habituated to the experienced distress and no longer performs compulsions (Tolin, 2009).

ERP has been shown to be effective for OCD clients with 60 to 70% of people successfully completing treatment (Öst, Havnen, Hansen, & Kvale, 2015). It has been shown to provide longer-lasting gains and more significant short-term improvement in symptoms than medication (Foa et al., 2005; Simpson et al., 2004). However, clients find this approach often difficult to tolerate, and many experience apprehension or outright fear the anxiety-induced confrontation component of this approach (Maltby & Tolin, 2003). It has been estimated that up to 20% of ERP patients drop

out of treatment prematurely (Abramowitz, 2006). ERP has also been met with high rates of treatment refusal and drop-out rates of up to 50% (Öst et al., 2015; Leeuwerik, Cavanagh, & Strauss, 2019; Steketee, 1993). Clients who do successfully complete treatment may continue to experience residual symptoms (Abramowitz, 1998; Fisher & Wells, 2005) or even relapse (Foa & Kozak, 1996). Although ERP can be effective for many patients, up to 40% of those with OCD are not helped by ERP or other forms of psychotherapy (Abramowitz, 2006; Foa, 2010).

Appraisal Model. It was Beck who proposed with his cognitive specificity hypothesis that psychopathologies arise on the basis of various dysfunctional beliefs (Beck, 1976). Since the 1980s, models of OCD have posited that the origin of obsessions lies in intrusive cognitions, whose significance to the individual is derived from their appraisal (Rachman, 1997). Studies have shown that the majority of the population experiences intrusive thoughts during their lifetime, and intrusive content is similar to the content of obsessions found in those with OCD (Julien, O'Connor, & Aardema, 2007; Salkovskis & Harrison, 1984). Based on these findings, the appraisal model posits that the occurrence of intrusive thoughts alone is not responsible for the onset of OCD, but rather the appraisal of intrusive thoughts as relevant and significant to one's person on the basis of dysfunctional beliefs (Frost & Steketee, 2002; Salkovskis, 1985, 1989, 1996).

In the appraisal model, when one appraises intrusions as threatening due to dysfunctional beliefs, one experiences distress and attempts to remove intrusions and prevent their perceived consequences by performing compulsions (Taylor, Abramowitz, McKay, & Cuttler, 2012). The frequency of intrusions then increases, becomes persistent, and evolves into clinical obsessions (Rachman, 1997; Salkovskis, 1985). Moreover, specific dysfunctional beliefs related to OCD have been established by research (OCCWG, 1997, 2001, 2003, 2005). Dysfunctional beliefs associated

with OCD are excessive responsibility, the over-importance and need to control thoughts, the over-estimation of threat, perfectionism, and intolerance to uncertainty (OCCWG, 2005).

Therapy based on the appraisal model often occurs in the context of CBT by supplementing ERP with cognitive restructuring, whose aim is the modification of key dysfunctional beliefs (Chosak, Marques, Fama, Renaud, & Wilhelm, 2009). Cognitive restructuring aims to first identify, record and target dysfunctional beliefs and assist the client in restructuring them by generating more logical, rational, helpful or realistic responses and self-statements (Tolin, 2009). The cognitive phase of CBT for OCD is usually followed by an exposition phase whilst continuing cognitive restructuring (Foa, 2010).

Because cognitive interventions for OCD are rarely applied without ERP, they tend to have the same treatment outcome limitations as ERP (Rosa-Alcázar, Sánchez-Meca, Gómez-Conesa, & Marín-Martínez, 2008). These treatments do not address obsessions, as they instead target the appraisal of intrusive cognitions (Frost & Steketee, 2002; O'Connor, 2002). Findings indicate that appraisal-based treatments do not substantially add to the efficacy of behavioral interventions, as they produce equivalent treatment outcome improvement (Foa, 2010; Rosa-Alcázar et al., 2008). ERP thus currently remains the first-line treatment for OCD (Foa, 2010).

Inference-Based Approach (IBA). The Inference-Based Approach (IBA) proposes that OCD is a disorder of the imagination that is characterized by pathological doubt (Julien, O'Connor, & Aardema, 2016). While appraisal-based models propose that obsessions develop from the dysfunctional appraisal of intrusive cognitions, IBA is based on the central notion that obsessions arise as the result of dysfunctional reasoning processes regardless of symptom subtype (O'Connor & Aardema, 2012; O'Connor, Aardema, & Pélissier, 2005). Instead of locating the origin of obsessions in the occurrence of intrusive cognitions, the model argues that obsessions are

inferences of doubt that occur before any appraisal (e.g. “I might be contaminated”; “I might have left the door unlocked”) that the person arrives at through dysfunctional reasoning that results in a process termed “inferential confusion,” where the person with OCD gives credibility to the obsessional doubt (Aardema & O’Connor, 2007; Julien et al., 2016; O’Connor & Robillard, 1995, 1999).

IBA proposes a sequence (O’Connor, Ecker, Lahoud, & Roberts, 2012) to explain the onset and maintenance of OCD: an internal or external element may trigger a primary inference (doubt), as the result of inferential confusion. A secondary inference follows the primary inference concerning the consequences that are to follow, which gives rise to anxiety symptoms. Compulsions are performed to reduce anxiety created by the secondary inference, but also reinforce the person’s conviction towards the primary inference, hence leading to the maintenance of OCD (Julien et al., 2016; Aardema & O’Connor, 2003).

Inferential Confusion in IBA. Recent findings propose that inferential confusion may be a critical cognitive factor in the development and maintenance of OCD (Aardema & O’Connor, 2003, 2007; Aardema, Wong, Audet, Melli, & Baraby, 2018; Aardema, Wu, et al., 2018; Aardema et al., 2010). Defined concisely, inferential confusion presents a confusion between reality and possibility where the person gives credibility to obsessional inferences without any actual evidence in the here now supporting these inferences (Aardema, O’Connor, Emmelkamp, Marchand, & Todorov, 2005; O’Connor & Robillard, 1995, 1999). That is, a person in a state of inferential confusion entertains purely imaginary possibilities as if they are actual probabilities based in reality, thereby failing to recognize the unrealistic and imaginary nature of an obsession.

According to IBA, the dysfunctional reasoning giving rise to a state of inferential confusion a distrust of the senses (or the self) and an overreliance on possibility or the imagination when

coming to conclusions about reality. This dysfunctional reasoning is embedded in an inductive narrative that leads up to an obsessional inference (O'Connor, 2002). An example of an inductive narrative about the symptom subtype of contamination that leads to an obsessional inference would be: "Some invisible germs can survive outside the body for weeks on surfaces and still contaminate people (narrative); so my hands might be contaminated right now and I should wash them (obsessional inference)." For this same example, the IBA sequence would be: "Maybe my hands are contaminated (primary inference); if they are, I might be sick (secondary consequence); being sick would be terrible (anxiety); I must therefore wash my hands (compulsion and neutralization of anxiety)" (O'Connor, 2002; O'Connor et al., 2012).

Main Components of Inferential Confusion. Based on qualitative content analysis, clinical observations and psychometric empirical investigations, the literature (Aardema et al., 2010; O'Connor, Aardema, & Pélissier, 2005; O'Connor & Robillard, 1995, 1999; O'Connor et al., 2012) has identified six dysfunctional reasoning processes that give rise to a state of inferential confusion (see Table 1).

Table 1

Six Dysfunctional Reasoning Processes in the IBA Literature

Reasoning Process	Definition	Example
Inverse Inference	One's inferences about reality precede, rather than follow from, observation of reality	"A lot of people must have walked on this floor, thus it could be dirty."
Category Errors	One confuses two categories of information or objects as if one has something to do with the other	"If this white table is dirty, it means the other white table could need cleaning."
Apparently Comparable Events	One confuses two distinct events separated by time and place	"My friend often drives off and leaves his garage door open, so mine could be open."
Selective Use of Out-of-Context Facts	Abstract facts are inappropriately applied to specific personal contexts	"Microbes do exist, so therefore there might be microbes infecting my hand."
Purely Imaginary Sequences	One makes up convincing stories and lives them	"I can feel myself getting nauseous and weak when I think I might be ill."
Distrust of Normal Perception	One disregards the five senses in favor of going deeper into reality	"I may not see something, but a lot of things are invisible."

More recently, given the conceptual overlap of these dysfunctional reasoning processes, and to guide further research, an IBA working group has regrouped all of the reasoning processes into three broad, more conceptually-distinct and parsimonious categories (Aardema, Baraby, Wong, & Audet, 2019). These components of inferential confusion were proposed as the result of theoretical deliberations and were based on the theoretical and empirical work of previous authors employing the IBA (Aardema et al., 2010; Julien et al., 2016; O'Connor, Aardema, & Pélissier, 2005; O'Connor et al., 2012). The three main components are 1) inverse reasoning, 2) active dismissal of sensory information and self-knowledge, and 3) out-of-context associations.

Inverse reasoning is a central component of inferential confusion and refers to a reasoning structure which emphasizes an overreliance on hypothetical possibilities and the imagination when drawing negative conclusions about reality (O'Connor et al., 2012). Wong and Grisham (2017b), following the conceptual work on the IBA by O'Connor and Robillard (1995), explain that healthy reasoning involves a structure where actual observations of reality lead to valid and contextually-relevant conclusions or possibilities (e.g., "This pole looks dirty because it has prints on it, therefore, a lot of people may have touched this pole"). However, during inverse reasoning, the structure is inverted. Therefore, observations about reality no longer precede conclusions; instead, hypothetical possibilities precede observations about reality despite opposing evidence (e.g. "A lot of people may have touched this pole, therefore, it could be dirty and contaminate me"). Because inverse reasoning may be endorsed by an OCD patient while another reasoning process is simultaneously employed (Aardema et al., 2019), the three components of inferential confusion may overlap and are thus not intended to be mutually exclusive, as they all share a common element of going beyond reality (O'Connor, Aardema, & Pélissier, 2005).

The second component of inferential confusion is termed the "active dismissal and distrust of sensory information and self-knowledge". Its central feature is the active dismissal that is employed by the OCD patient, where the sensory information received from their environment and the knowledge about their own self is knowingly and actively dismissed (O'Connor, Aardema, & Pélissier, 2005; O'Connor et al., 2012). The person will actively disregard information coming from their five senses, as these are considered fallible and thus not to be employed when authenticating their daily experiences. Hence, the OCD patient will often favor going beyond their own senses and self-knowledge in determining what is true or untrue (O'Connor, Aardema, & Pélissier, 2005). To justify a conclusion about reality, the OCD patient employing this process will actively dismiss sensory information by going beyond their own senses (e.g. "I may not see something, but a lot of things are invisible"; O'Connor, Aardema, & Pélissier, 2005), or by going beyond knowledge about their own self (e.g. "I know I have never really hurt anyone, but perhaps I could"; Aardema & O'Connor, 2003).

The third component of inferential confusion is termed "out-of-context associations". It is characterized by a person misapplying out-of-context information to their own personal and current situation (O'Connor, Aardema, & Pélissier, 2005). Whether the information has any basis in reality or not, it is arbitrarily applied to justify a conclusion and is not supported by direct evidence in the person's current situation. The associations in this third reasoning process can be subdivided in three components, namely (1) categories, (2) events, and (3) facts or information from authority figures (O'Connor, Aardema, & Pélissier, 2005; Julien et al., 2016; O'Connor et al., 2012). The first component, categories, is when a person confuses two separate and distinct categories of information, objects or people (e.g. "If this white table is dirty, it means the other white table could need cleaning"). The second component, events, is when a person confuses two

distinct events separated by time and place (e.g. “My friend left his home earlier today without closing the garage door, so mine could also have been left open”). The final component, facts or information from authority figures, is when a person applies abstract facts or information from authority figures, such as the media, without adapting them to their own personal and current situation (e.g., “I heard on the news that people my age are at risk of heart disease, so I might die any minute of a heart attack”.

Inferential Confusion and its Relation to the Feared Self. Concerns about the self have also been implicated in the development and maintenance of OCD. It was Rachman (1998) who initially noted that individuals with repugnant obsessions are often afraid that their own thoughts might reflect hidden and negative characteristics about themselves. Other authors (Aardema & O’Connor, 2003, 2007) have also proposed that individuals with unacceptable thoughts often mistakenly attribute negative traits to themselves and distrust their own self, which, in turn, can give rise to imagined aversive intrusions that may be falsely taken as evidence for a flawed character. Consistent with these findings, Aardema et al. (2013) have proposed that a “feared self”, that is “the fear of who one might be or become”, may be implicated in the development and maintenance of OCD. Moreover, intrusions and obsessional self-doubts may be more likely to arise and be interpreted as significant and threatening to the individual if they are thematically related to their feared self (Aardema et al., 2013). Hence, the confusion between the “self-as-it-could-be” and the “actual self” may lead to obsessional doubt (Nikodijevic, Moulding, Anglim, Aardema, & Nedeljkovic, 2015), and said obsessional doubt may lead to repeated attempts at neutralizing the aversive intrusion (Aardema et al., 2013).

Research employing the IBA conceptualization of OCD suggests that those with OCD may overinvest in a feared self as opposed to their actual self via inferential confusion (Aardema &

O'Connor, 2003, 2007; Aardema, O'Connor, et al., 2005; O'Connor, Aardema, & Pélissier, 2005). The IBA model posits that the hidden and unseen nature of one's perceived threat may come about as a result of distrusting the senses and an over-reliance on hypothetical possibilities that are not based on self-knowledge or sensory input (Aardema & O'Connor, 2003, 2007; Aardema, O'Connor, Pélissier, & Lavoie, 2009). Following these conceptualizations, a working model based on the IBA on the role of the feared self as a core construct in the development and maintenance of OCD has been recently proposed (see Aardema & Wong, 2020a). This model proposes that an increased reliance on the imagination during reasoning would facilitate the development of a feared self, which in turn would drive the appraisal of intrusions as threatening and significant to one's self due to dysfunctional beliefs, hereby resulting in experienced anxiety, which one would attempt to neutralize by performing compulsions.

Findings provide evidence that self-reported OCD symptoms can be predicted by feared self-perceptions, as measured by scores on the Fear of Self Questionnaire (FSQ; Aardema et al., 2013; Aardema, Wong, et al., 2018). In non-clinical samples, the FSQ was significantly correlated to OC symptoms and uniquely predicted obsessions, independent of negative mood states, beliefs about intrusions or other measures of self-themes (Aardema et al., 2013). In OCD samples, the FSQ was significantly correlated to obsessions, while having non-significant relationships with other symptom domains, such as checking or contamination (Melli, Aardema, & Moulding, 2016; Aardema, Moulding, et al., 2017). In a study using OCD patients receiving psychotherapy, treatment-related improvements on the FSQ significantly and uniquely predicted reductions in both obsessions and contamination subtypes as measured by the Vancouver Obsessional-Compulsive Inventory (VOCI; Thordarson et al., 2004), independent of negative mood states (Aardema, Wong, et al., 2018). These convergent findings provide further evidence that feared

self-perceptions are relevant in the onset and maintenance of OC symptoms (Aardema, Wong, et al., 2018).

Finally, the inference-based clinical application of the feared self has been considered during psychotherapy for all OCD symptom domains (Moulding et al., 2014; O'Connor & Aardema, 2012) and longitudinal clinical research has provided initial evidence for the importance of addressing feared self-perceptions for successful treatment outcome (Aardema, Wong, et al., 2018). Clinically-speaking, the first step in therapy involves helping the client identify their feared self as the source of their intrusions so that the individual eventually accepts that their thoughts originate from the imaginary feared self. This process of understanding that the thoughts do not exist in isolation can be applied to all OCD symptom domains. As such, by reducing the feared self during treatment, intrusions become more understandable and OCD symptoms eventually diminish. Moreover, experimental investigations support the notion that dysfunctional reasoning and feared self-perceptions may play a role in the development and maintenance of OCD (Jaeger, Moulding, Anglim, Aardema, & Nedeljkovic, 2015; Nikodijevic et al., 2015). However, investigations in this area remain scarce and the precise mechanisms by which dysfunctional reasoning and the feared self influence OC symptoms have yet to be established.

Inference-Based Cognitive-Behavioural Therapy for OCD. IBA proposes three claims that differentiate it from other approaches: (1) OCD begins with a doubt, (2) the doubt stems from being a cognitive inference and not a cognitive intrusion, and (3) if the doubt is eradicated, the remaining chain of OCD consequences and behaviours will also be eliminated (O'Connor et al., 2012). Inference-Based Cognitive-Behavioural Therapy (I-CBT), developed from IBA, is thus designed to target the pervasive doubt that precedes the consequences, appraisals and behaviours in OCD. Instead of addressing appraisals, I-CBT addresses the dysfunctional process by which the

obsession comes about, thereby rendering it irrelevant and non-significant. I-CBT employs techniques based on the imagination and allows for the contrasting of the reasoning processes that give rise to normal and pathological doubts (Julien et al., 2016).

During I-CBT, the therapist demonstrates to the client that OC symptoms are the result of an obsessional doubt that is not relevant or useful as it is not based on the five senses or self-knowledge (O'Connor et al., 2012). Treatment is deemed successful once the person no longer considers the doubt as relevant and when credibility is no longer given to obsessions, thus eliminating the need for compulsions (O'Connor, Aardema, & Pélissier, 2005).

Feared self-perceptions are also explicitly addressed in I-CBT (Aardema, Wong, et al., 2018). During treatment, I-CBT aims to demonstrate to clients that their feared possible self arises on the basis of an imaginary narrative that is opposed to their actual self. The therapist will help clients develop a greater level of self-trust by utilizing more reality-based criteria in defining their sense of self, thereby leading the client to better understand the normality of their intrusions and eventually decrease and improve their feared self-perceptions (Aardema & O'Connor, 2007; Aardema, Wong, et al., 2018; Moulding et al., 2014).

I-CBT addresses several of the limitations of ERP and CBT, which include high treatment refusal and drop-out rates, as well as the severe apprehension associated to being confronted with provoked distress that is difficult to tolerate (Aardema et al., 2022; Neziroglu, Henricksen, & Yaryura-Tobias, 2006). Clinical findings have shown that I-CBT is just as effective as ERP in reducing OCD symptoms, and likely significantly less aversive for those who seek treatment (Aardema, 2022; Aardema et al., 2022; O'Connor, Aardema, Bouthillier, et al., 2005). Findings also show that a decrease in inferential confusion is linked to superior treatment outcome and a reduction in OC symptoms (Aardema et al., 2010; Aardema, Emmelkamp et O'Connor, 2005;

Aardema et O'Connor, 2012; Aardema, Wong, et al., 2018), even for the most treatment-resistant OCD populations (Aardema, O'Connor, Delorme et Audet, 2017; Béland et O'Connor, 2014; Provencher et al., 2009; Taillon, O'Connor, Dupuis et Lavoie, 2013; Visser et al., 2015).

Most recently, a multicentre randomized controlled trial investigated the effectiveness of I-CBT by comparing it with the effectiveness of two other treatments in an OCD sample of 111 participants (i.e. appraisal-based cognitive behavioral therapy (CBT) and an adapted mindfulness-based stress reduction intervention (MSBR); Aardema et al., 2022). While all treatments appeared to significantly reduce general OCD severity and specific symptom dimensions without a significant difference between treatments, I-CBT appeared to have an advantage over the other treatments in terms of the rapidity by which participants reached remission as well as its effectiveness for overvalued ideation.

Measures of Inferential Confusion. The construct of inferential confusion can currently be measured by existing instruments, but several considerations and limitations must be carefully reviewed.

First, the Inferential Confusion Questionnaire – Expanded Version (ICQ-EV; Aardema et al., 2010) is a 30-item self-report questionnaire developed as an expansion of the validated Inferential Confusion Questionnaire (ICQ; Aardema, O'Connor, et al., 2005). Items on the ICQ-EV are rated on a 6-point Likert scale (1=strongly disagree to 6=strongly agree, total score between 0 and 180). The ICQ-EV was developed to further improve and refine the psychometric properties of the ICQ and to include a wider set of items that would result in a more exhaustive measurement of all the reasoning processes known to give rise to inferential confusion. The original validation study of the ICQ-EV employed principal component analysis across both clinical and non-clinical samples.

In the original validation study, those with OCD scored significantly higher on the scale than both non-clinical and clinical control groups. Furthermore, the ICQ-EV showed clinical validity as it was sensitive to measuring change in inferential confusion following the administration of Inference-based Cognitive-Behavioural Therapy (I-CBT; O'Connor, Aardema, & Pélissier, 2005). Furthermore, ICQ-EV scores were significantly related to successful treatment outcome for the OCD group. This was argued to be the effect of directly addressing reasoning processes during treatment. The ICQ-EV demonstrates excellent test-retest reliability (r =.90), high internal consistency (Cronbach's α = .97), and good convergent validity (r > .49 with a measure of OCD symptoms) and divergent validity (r < .36 with measures of distress in an OCD sample). Despite being a frequently-used validated measure of inferential confusion, a limitation of the ICQ-EV must be considered. Although it does measure all three dysfunctional reasoning processes known to give rise to inferential confusion, there is a need for converging evidence utilizing more varied methodologies given that previous research has strongly relied on a single self-report measure of inferential confusion.

A second instrument has been developed to measure inferential confusion. Wong and Grisham (2017b) argued that there is a need to establish the theoretical and clinical relevance of inferential confusion as specific to OCD through a comparison with other disorders and healthy populations utilizing varying methodologies that are not limited to self-report questionnaires. Indeed, self-report tools like the ICQ-EV do not measure inferential confusion in action, but rather rely on an individual's self-assessment and level of insight into their own situation, which may introduce bias (Catapano et al., 2010). As such, Wong and Grisham (2017b) developed a task-based instrument to measure inferential confusion in action. Their instrument, the Inverse Reasoning Task (IRT), measures one's endorsement of inverse reasoning, one of the three

reasoning processes that give rise to inferential confusion in the IBA. The IRT includes 18 short scenarios, 9 involving OCD-relevant concerns (i.e. contamination, checking, harm to others and religion), and 9 scenarios reflecting non-OCD-relevant concerns (e.g. punctuality). In each scenario, a character displays the use of inverse reasoning when confronted with a certain situation that reflects the OCD or non-OCD concern. Participants are asked to rate (Likert scale from 1 to 7, where 1=strongly disagree and 7=strongly agree) the degree to which they agree or disagree with a character's conclusion as well as the logic of their reasoning for each scenario. Higher scores indicate higher endorsement of inverse reasoning, with a total score computed for all scenarios. Separate subscale scores can be obtained for OCD-relevant scenarios and non-OCD-relevant scenarios.

Results of this initial study by Wong & Grisham (2017b) showed that the IRT has demonstrated good internal consistency (Cronbach's α = .83 for all scenarios; 0.66 for OCD-relevant scenarios; 0.76 for the non-OCD-relevant scenarios) and was validated in a non-clinical sample (Wong, Aardema, & Grisham, 2019; Wong & Grisham, 2017b). Also, significant correlations with OC symptoms were found (r = .19 for IRT total score; .20 for OCD-relevant scenarios) even when controlling for negative affect and OC belief domains. Further, a more recent study using the IRT found significantly greater endorsement in inverse reasoning for individuals with OCD on scenarios where OCD-relevant concerns were prompted when compared to both clinical and healthy controls (Wong, Aardema, & Grisham, 2019). The OCD group in this study also scored higher than healthy controls on the IRT for non-OCD scenarios, providing preliminary evidence that inverse reasoning may apply to a diverse range of situations for people living with OCD beyond disorder-specific contexts.

Despite these findings employing the task-based IRT, limitations should be considered. First, the IRT is not an exhaustive measure of inferential confusion, as it only measures one of the principal three dysfunctional reasoning processes proposed by the IBA. Also, it does not cover the full range of unacceptable thoughts, which do include harm and religion, but are also comprised of other predominant themes (e.g. sexuality, immorality, psychopathy and pedophilia; Aardema & O'Connor, 2007; Moulding et al., 2014).

Finally, despite these important findings employing the ICQ-EV and the IRT, investigations into the role of dysfunctional reasoning in relation to feared self-perceptions are scarce. A recent study employing both the IRT and the FSQ in an undergraduate student sample (N = 437) found that both inverse reasoning and feared self-perceptions uniquely predicted OC symptoms (Baraby, Wong, Radomsky, & Aardema, 2019). There was also a significant interaction effect between the IRT and the FSQ that explained an additional amount of unique variance in the prediction of OC symptoms. Results suggest that beyond an additive effect of feared self-perceptions and dysfunctional reasoning in OC symptoms, that if dysfunctional reasoning is elevated, the effect of feared self-perceptions on OC symptoms increases, and vice versa. This study provides preliminary evidence that dysfunctional reasoning processes and feared self-perceptions are relevant to OC symptomatology and that further investigation into their role on the development and maintenance of OCD is warranted.

Thesis Objectives

Previous research has highlighted the potential role of dysfunctional reasoning processes (i.e. "inferential confusion") and feared self-perceptions in the development and maintenance of Obsessive-Compulsive Disorder (OCD). However, there is a need to establish the theoretical and clinical relevance of inferential confusion as specific to OCD through a comparison with other

disorders and healthy populations utilizing varying methodologies that are not limited to self-report questionnaires. Indeed, most investigations have predominantly employed self-report measures of inferential confusion, and investigations into inferential confusion in relation to feared self-perceptions remain scarce. Moreover, previous investigations only pertain to a limited number of reasoning processes (i.e. "inverse reasoning" as measured by the IRT) and fail to cover the entire spectrum of processes proposed to be relevant to OCD. Finally, investigations into improvements in dysfunctional reasoning and their relationship with successful treatment outcome among those with OCD are also limited. Hence, the investigation into all three types of reasoning processes in relation to feared self-perceptions, OC symptomatology and treatment outcome remains largely unexplored.

The principal objective of this thesis is to investigate the role of dysfunctional reasoning processes in relation to feared self-perceptions, OC symptomatology and treatment outcome. To this end, we have conducted a series of three studies. The first part of the present thesis describes the first study, while the second part of the present thesis describes the second and third studies.

Part I. The first part of the thesis aimed to establish the relationship of dysfunctional reasoning processes with feared self-perceptions and OC symptomatology in a non-clinical sample. To this end, we developed a novel task-based measure, the Dysfunctional Reasoning Processes Task (DRPT), a measure covering a wide range of OCD-relevant dysfunctional reasoning processes relative to existing task-based instruments (i.e., Inverse Reasoning Task; IRT; Wong & Grisham, 2017b). 172 undergraduate students were recruited as participants at Concordia University. The study received ethics approval from the local ethics board (see Appendix A). All participants provided consent, and then completed computerized versions of the DRPT and self-report measures on the Checkbox platform online.

Hypotheses. It was hypothesized that: (1) inferential confusion would relate significantly with convergent and divergent self-report measures; (2) inferential confusion and feared self-perceptions would independently contribute to the prediction of OC symptoms, even when controlling for depressive symptoms and OC-related beliefs; and (3) feared self-perceptions and OC-related beliefs would sequentially mediate the relationship between inferential confusion and OC symptoms (i.e., inferential confusion → feared self-perceptions → OC-related beliefs → OC symptoms).

Part II. The second part of the present thesis describes a series of two studies focused on the role of dysfunctional reasoning processes in relation to OC symptomatology and treatment outcome. The first study of part II aims to establish the theoretical and clinical relevance of dysfunctional reasoning processes as specific to OCD through a comparison with other disorders and healthy populations. The second study of part II aimed to investigate the impact of psychological treatment on dysfunctional reasoning and its relationship with treatment outcome. Both studies in this second part of the thesis employed the DRPT as a novel task-based measure of inferential confusion to overcome existing limitations in its measurement and scope.

First, we aimed to establish the relevance of dysfunctional reasoning in patients diagnosed with OCD as compared to clinical and non-clinical controls to expand on previous research that have highlighted the specificity of inferential confusion to OCD in comparison to clinical and community controls (Aardema et al., 2010; Wong et al., 2019). Participants were recruited at the Obsessive-Compulsive Research Laboratory (OCD-RL) located at the Centre de recherche de l'Institut universitaire en santé mentale de Montréal (CR-IUSMM). The study received ethics approval from the local ethics board (see Appendix A). All participants provided informed consent. Participants with OCD were recruited from an ongoing large-scale randomized control trial (RCT)

at OCD-RL, while control participants were recruited through social media. Diagnostic evaluations were completed by videoconference using Zoom Health due to the ongoing COVID pandemic health measures. Sixty-four OCD participants, as well as thirty anxious and thirty-four healthy controls completed computerized versions of the DRPT and related measures on the Checkbox platform online. See Figure 1 for participant flow through the study.

Hypotheses. It was hypothesized that: (1) inferential confusion would relate significantly with symptoms of OCD and related measures; (2) reasoning processes would be significantly more elevated for the OCD group relative to clinical and non-clinical control groups; (3) reasoning processes and feared self-perceptions would significantly and uniquely predict OC symptoms even when controlling for negative mood states and OC beliefs among those with OCD.

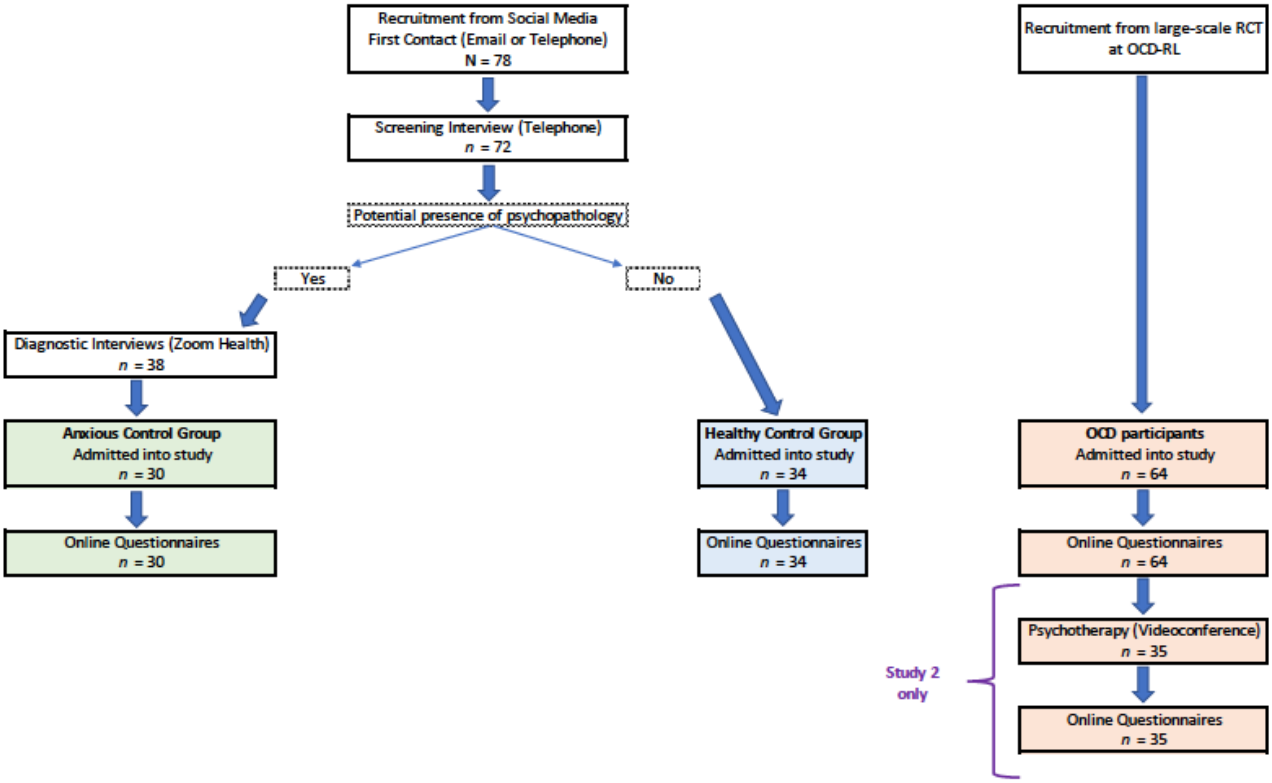

Figure 1. The flow of participants through studies 1 and 2 of Part II of the present thesis.

Second, we aimed to investigate the relationship between improvements in dysfunctional reasoning with treatment outcome among those with OCD. Thirty-five participants diagnosed with OCD recruited through an ongoing RCT conducted at OCD-RL completed sixteen sessions of cognitive-behavioural therapy (CBT) and completed computerized versions of the DRPT and related measures on the Checkbox platform online before and after treatment. The study received ethics approval from the local ethics board (see Appendix A). All participants provided informed consent (see Appendix B). Diagnostic evaluations and psychotherapy sessions were completed by videoconference using Zoom Health due to the ongoing COVID pandemic health measures. See Figure 2 for participant flow through the study.

Hypotheses. It was hypothesized that: (1) CBT would lead to significant improvements in dysfunctional reasoning, and (2) level of improvement in dysfunctional reasoning during CBT would be significantly associated with successful treatment outcome.

Article 1: Dysfunctional reasoning processes and their relationship with feared self-perceptions and obsessive-compulsive symptoms: An investigation with a new task-based measure of inferential confusion[1]

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This research was supported in part by grants and fellowships from the Canadian Institutes of Health Research (CIHR) and Fonds de recherche du Québec – Santé (FRQS). Declarations of interest: none.

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[1]This is the accepted and published version of the following article: Baraby, L. P., Wong, S. F., Radomsky, A. S., & Aardema, F. (2021). Dysfunctional reasoning processes and their relationship with feared self-perceptions and obsessive-compulsive symptoms: An investigation with a new task-based measure of inferential confusion. *Journal of Obsessive-Compulsive and Related Disorders*, *28*, 100593. https://doi.org/10.1016/j.jocrd.2020.100593.

Abstract

Previous research has highlighted the potential role of dysfunctional reasoning (i.e. “inferential confusion”) and feared self-perceptions in the development and maintenance of Obsessive-Compulsive Disorder (OCD). However, these investigations have primarily relied on self-report measures, and investigations into inferential confusion in relation to feared self-perceptions remain scarce. Also, previous investigations only pertain to a limited number of reasoning processes in inferential confusion (i.e. inverse reasoning) and fail to cover the entire spectrum of processes proposed to be relevant to OCD. In the present study, a new task-based measure, the Dysfunctional Reasoning Processes Task (DRPT), covering a wider range of dysfunctional processes, was used to investigate the relationship of inferential confusion with feared self-perceptions and symptoms of OCD. 172 undergraduate students completed computerized versions of the DRPT and self-report measures. Results showed that feared self-perceptions and OC-related beliefs sequentially mediated the relationship between inferential confusion and OC symptoms. Hence, without a feared self, the effect of inferential confusion on OC symptoms may be attenuated. These findings provide further evidence of the interrelationship between dysfunctional reasoning and feared self-perceptions and their potential role in the development and maintenance of OCD, emphasizing the need to address both in cognitive-behavioral treatment.

Keywords: Inference-based approach; inferential confusion; fear of self; obsessive-compulsive disorder.

Dysfunctional reasoning processes and their relationship with feared self-perceptions and obsessive-compulsive symptoms: An investigation with a new task-based measure of inferential confusion

In the last few decades, much of our understanding of the etiology of Obsessive-Compulsive Disorder (OCD) has been advanced by cognitive-behavioral models that posit that the origin of obsessions lies in intrusive cognitions (Rachman, 1997, 1998; Salkovskis, 1985, 1989, 1996). These models propose that the appraisal of intrusive thoughts as significant and personally meaningful leads to their escalation into obsessions and subsequent obsessive-compulsive symptomology. In particular, when one appraises intrusions as threatening due to dysfunctional beliefs, one experiences distress and attempts to remove intrusions and prevent their perceived consequences by performing compulsions (Taylor et al., 2012). Specific dysfunctional belief domains related to OCD include excessive responsibility, the over-importance and need to control thoughts, the over-estimation of threat, perfectionism, and intolerance to uncertainty (Julien et al., 2008; OCCWG, 1997, 2001, 2003, 2005).

A complementary cognitive model, termed the inference-based approach (IBA), has primarily focused on the role of dysfunctional reasoning prior to the occurrence of obsessional intrusions (Julien et al., 2016). This model argues that obsessions are inferences of doubt (e.g., "the car *might be* unlocked") that find their justification in a wide variety of idiosyncratic narratives that contain reasoning distortions specific to OCD. In particular, the person with OCD gives credibility to subjective hypothetical premises at the expense of reality through a distrust of the senses and an overreliance on the imagination during reasoning – a process that has broadly been described as "inferential confusion" (Aardema, O'Connor, et al., 2005). Due to inferential confusion, as the person gives credibility to their obsessional doubts, any perceived consequence

(e.g., “if the car is unlocked, then it might be stolen”) are also inferred to be true, hereby generating distress which individuals with OCD will attempt to neutralize via compulsive acts (e.g., repeatedly checking on the car; O’Connor et al., 2012; Wong et al., 2019).

Research findings suggest that inferential confusion may be an important cognitive factor in the development and maintenance of OCD (Aardema, Wong, et al., 2018; Aardema, Wu, et al., 2018; Aardema et al., 2010; Wong & Grisham, 2017a). Aardema et al. (2010) developed a self-report questionnaire, the Inferential Confusion Questionnaire – Expanded Version (ICQ-EV), which has shown significant relationships with OCD symptoms across multiple studies, even when controlling for negative mood states and OC-related beliefs (Aardema et al., 2013; Aardema, O’Connor, et al., 2005; Aardema, Radomsky, O’Connor, & Julien, 2008; Aardema, Wong, et al., 2018; Aardema & Wu, 2011; Aardema et al., 2010; Paradisis, Aardema, & Wu, 2015; Wong & Grisham, 2017b; Wu, Aardema, & O’Connor, 2009). Notably, those diagnosed with OCD have been shown to score higher on inferential confusion than both non-clinical and clinical controls, which means that those with OCD demonstrate an increased tendency to confuse imagined possibilities with reality (Aardema, Emmelkamp, & O’Connor, 2005; Aardema, O’Connor, et al., 2005; Aardema et al., 2010). Furthermore, inferential confusion appears to be relevant to treatment outcome, as reductions in inferential confusion are associated with reductions in OC symptoms (Aardema, O’Connor, et al., 2005; Aardema, Wong, et al., 2018).

Although research suggests that inferential confusion is significantly associated with various OCD symptoms, this key construct from the IBA has been primarily investigated using a single self-report measure, the ICQ-EV (Julien et al., 2016). To address this limitation, Wong and Grisham (2017b) developed an experimental task-based instrument, the Inverse Reasoning Task (IRT), to measure one’s endorsement of inverse reasoning, which is proposed to be one of the key

reasoning processes characteristic of inferential confusion (Julien et al., 2016; O'Connor, Aardema, & Pélissier, 2005). *Inverse reasoning* refers to a reasoning structure that emphasizes the importance of hypothetical possibilities when drawing negative conclusions about reality (O'Connor et al., 2012). In contrast, healthy reasoning involves a structure where actual observations of reality lead to valid and contextually-relevant conclusions or possibilities (e.g., "This pole looks dirty because it has prints on it, therefore, a lot of people may have touched this pole"). In sum, during inverse reasoning, the structure is inverted and observations about reality no longer precede conclusions; instead, hypothetical possibilities precede observations about reality despite opposing evidence (e.g., "A lot of people may have touched this pole, therefore, it could be dirty and contaminate me"; O'Connor, Aardema, & Pélissier, 2005; Wong & Grisham, 2017b).

On the IRT, participants are presented with scenarios and narratives where a character displays the use of inverse reasoning when confronted with a certain situation. Participants are asked to rate the degree to which they agree or disagree with a character's conclusion and the logic of their reasoning for each scenario, where higher scores indicate higher endorsement of inverse reasoning. Scores on the IRT have been significantly associated with various OCD symptoms (Wong et al., 2019; Wong & Grisham, 2017b). Moreover, significantly greater endorsement in inverse reasoning has been found for individuals with OCD on scenarios where OCD-relevant concerns were prompted when compared to both clinical and healthy controls (Wong et al., 2019).

Beyond inverse reasoning, a number of closely-related dysfunctional reasoning processes giving rise to inferential confusion have been identified in the IBA literature, including an over-reliance on possibility during reasoning, absorption into imaginary sequences, category errors, irrelevant associations, selective use of out-of-context facts, and apparently comparable events

(Julien et al., 2016; O'Connor et al., 2012; O'Connor, Aardema, & Pélissier, 2005; O'Connor & Robillard, 1995, 1999). However, there is considerable conceptual overlap between these six reasoning processes. For example, four of the reasoning processes, including category errors, irrelevant associations, apparently comparable events and selective use of out-of-context facts, all involve the concept of confusing two distinct properties and applying them to one's own personal situation. In addition, two reasoning processes, including the over-reliance on possibility during reasoning and the absorption into imaginary sequences, both involve the active disregard of one's own senses in favor of going deeper into reality.

Given this conceptual overlap between these reasoning processes, and to guide further research, an IBA working group has regrouped all of the reasoning processes into three broad, more conceptually-distinct and parsimonious categories (Aardema et al., 2019), including 1) *inverse reasoning*, 2) *the active dismissal and distrust of sensory information and self-knowledge,* and *3) out-of-context associations.* During *the active dismissal and distrust of sensory information and self-knowledge*, an individual actively disregards information coming from their five senses during reasoning, as these are considered fallible and thus not to be employed when authenticating their daily experiences. Hence, the individual struggling with OCD will often favor going beyond their own senses (e.g., "I may not see something, but a lot of things are invisible") or their self-knowledge in determining what is true or untrue (e.g., "I know I have never really hurt anyone, but perhaps I could"; Aardema & O'Connor, 2003). *Out-of-context associations* are characterized by a person misapplying out-of-context information (e.g., categories, objects, people, events, or facts) to their own personal and current situation during reasoning. That is, information is arbitrarily applied to justify a conclusion and is not supported by direct evidence in the person's current situation (e.g., "If this white table is dirty, it means the other white table could need

cleaning"; "My friend left his home earlier today without closing the door, so mine could also have been left open"; "I heard on the news that people my age are at risk of heart disease, so I might die any minute of a heart attack"; O'Connor, Aardema, & Pélissier, 2005).

While the above-mentioned reasoning processes are represented in a psychometric extended measure of inferential confusion (i.e., ICQ-EV), they have not yet been investigated in a task-based measure of inferential confusion (i.e. IRT), which has only focused on the role of inverse reasoning in OCD. Further, it has been suggested that dysfunctional reasoning processes characterized by inferential confusion are implicated in the formation of feared self-perceptions and self-doubts underlying OCD symptomatology (Aardema & O'Connor, 2007). According to the IBA model, these reasoning processes remove the person from their actual self, giving credibility to an imagined and feared possible self, which subsequently leads to absorption into feared states of mind associated with negative self-representation (e.g., "Psychopaths never feel guilty. Therefore, if I don't feel guilty, I may hurt my children"; Aardema & O'Connor, 2003, 2007; O'Connor, Aardema, & Pélissier, 2005).

Indeed, previous studies have supported the association of dysfunctional reasoning processes with feared self-perceptions, as well the link between feared possible selves with OC symptomatology (Aardema et al., 2013; Aardema, Moulding, et al., 2017; Aardema, Wong, et al., 2018; Audet, Wong, Radomsky, & Aardema, 2020; Coimbra-Gomes, 2020; Doron, 2020; Jaeger et al., 2015; Krause, Wong, O'Meara, Aardema, & Radomsky, 2020; Melli et al., 2016; Wong, Aardema, Mendel, Trespalacios, & Radomsky, 2020). In fact, the inference-based clinical application of the feared self has been considered during psychotherapy for OCD (Aardema, 2020; Moulding et al., 2014; O'Connor & Aardema, 2012). In a recent study using OCD patients receiving psychotherapy, treatment-related improvements on feared self-perceptions significantly

and uniquely predicted reductions in both repugnant obsessions and physical contamination symptoms, independent of negative mood states, providing evidence for the importance of addressing feared self-perceptions for successful treatment outcome (Aardema, Wong, et al., 2018).

While the relationship between dysfunctional reasoning, feared self-perceptions and OCD symptomatology is likely a complex one, recent conceptualizations suggest that feared self-perceptions and OC-related beliefs may sequentially mediate the relationship between inferential confusion and OC symptoms (Aardema & Wong, 2019). That is, in a similar way that intrusions and obsessional doubts (e.g., "I might have left the stove off") may arise as the result of dysfunctional reasoning processes characterized by an investment in possibility and a distrust of the senses or self-knowledge during reasoning (inferential confusion), this may also be the case when justifying feared possible selves that actually have no real basis in reality (e.g., "I fear I might be careless person"). Indeed, in the absence of a feared possible self, it seems unlikely that the effect of dysfunctional reasoning on obsessive-compulsive symptomatology is as profound relative to when this dysfunctional reasoning contributes to the formation of the feared self and specifically occurs *through* the feared self-theme of the individual. For example, a person with the obsession that he might harm someone (e.g., "Even though I never act violently, perhaps there's something wrong with me deep down"), while also harboring fears regarding his identity ("I might be a violent person"), would be expected to be particularly vulnerable to the occurrence of obsessional intrusions and doubts that seem to confirm this fear despite evidence to the contrary. In other words, dysfunctional reasoning might facilitate the development of feared self-perceptions, which would in turn drive the misinterpretation of obsessional intrusions, and result in the occurrence of compulsions.

Experimental investigations have supported the notion that dysfunctional reasoning and feared self-perceptions may play a role in the development and maintenance of OCD (Jaeger et al., 2015; Nikodijevic et al., 2015; Sauvageau, O'Connor, Gilles, & Aardema, 2020). A recent study employing the IRT in a large undergraduate student sample found that both inverse reasoning and feared self-perceptions uniquely predicted OC symptoms (Baraby et al., 2019). However, experimental studies in this area remain scarce and the precise mechanisms by which dysfunctional reasoning and the feared self influence OC symptoms have yet to be established by experimental research. Moreover, the few existing measures of inferential confusion only pertain to a limited number of reasoning processes and fail to cover the entire spectrum of processes proposed to be relevant to OCD. First, the ICQ-EV does measure all three reasoning processes, but it is a self-report questionnaire that delves into subjects' perspectives and is largely subjected to information bias, such as social desirability (Althubaiti, 2016). Second, the IRT only measures one of the three processes of inferential confusion and also does not cover the full range of unacceptable thoughts, such as themes of sexuality, psychopathy, and pedophilia (Aardema & O'Connor, 2007; Moulding et al., 2014).

Aims and hypotheses of the present study

The current study aimed to investigate the relationship between inferential confusion, feared self-perceptions, and OC symptomatology by using an expanded version of the IRT, the Dysfunctional Reasoning Processes Task (DRPT), which covers a wider range of dysfunctional reasoning processes proposed to be relevant in OCD. It was hypothesized that: (1) inferential confusion, as measured by the DRPT, would relate significantly with convergent and divergent self-report measures; (2) inferential confusion, as measured by the DRPT, and feared self-perceptions would independently contribute to the prediction of OC symptoms, including all

specific OC symptoms as measured by the VOCI for the DRPT, even when controlling for depressive symptoms and OC-related beliefs; and (3) feared self-perceptions and OC-related beliefs would sequentially mediate the relationship between inferential confusion, as measured by the DRPT, and OC symptoms (i.e., inferential confusion → feared self-perceptions → OC-related beliefs → OC symptoms).

Method

Procedure

The current non-clinical sample was recruited at Concordia University with original data specific to the purposes for the current study. The study received ethics approval from the local ethics board. After signing up for the study on Concordia University's online participant pool platform, eligible individuals were provided with a link to complete an online questionnaire package containing the present study's measures, which was hosted online by the Checkbox software program, maintained by Concordia University. Two versions of the questionnaire package were created where measures were ordered differently in order to control for possible sequence effects and allow for counterbalancing across participants. Each participant was randomly assigned to complete one of the two versions of the questionnaire package. Prior to beginning the questionnaires, participants were prompted to provide informed consent. They then completed the battery of measures at a single point in time. Upon completion, participants were debriefed, thanked, and received one Concordia University participant pool credit for their participation.

Participants

The final sample was composed of 172 undergraduate psychology students. The use of analogue samples in OCD research has been shown to be appropriate and relevant in understanding

obsessions and compulsions (Abramowitz et al., 2014; Gagné, Kelly-Turner, & Radomsky, 2018). The sample demographics, including means and standard deviations on all measures, are presented in Table 1.

Measures

Dysfunctional Reasoning Processes Task (DRPT). The DRPT (see Appendix) was developed as an expanded version of the Inverse Reasoning Task (IRT; Wong & Grisham, 2017b). While the IBA literature has previously identified several reasoning processes proposed to give rise to inferential confusion (for a detailed explanation of all reasoning processes, see O'Connor, Aardema, and Pélissier (2005) and O'Connor et al. (2012)), an IBA working group has recently reconceptualized all reasoning processes previously identified into three main components in an effort to reduce overlap between them and to guide further research (Aardema et al., 2019). The DRPT is thus a new task-based instrument to measure one's endorsement of the three main reasoning processes that are known to give rise to inferential confusion in OCD: (1) inverse reasoning, (2) active dismissal of sensory information and self-knowledge, and 3) out-of-context associations (Aardema et al., 2019; O'Connor, Aardema, & Pélissier, 2005). It includes 30 short scenarios, 24 involving OCD-relevant concerns (i.e., contamination, checking, just right, and unacceptable thoughts), and six scenarios reflecting non-OCD-relevant concerns (e.g., punctuality). In each scenario, a character displays the use of a reasoning process when confronted with a certain situation that reflects an OCD or non-OCD concern. Participants are asked to rate, using a Likert-type scale ranging from 1 to 7 (1=strongly disagree and 7=strongly agree) the degree to which they agree or disagree with the logic of the character's reasoning for each scenario. Higher scores indicate higher endorsement of dysfunctional reasoning, with a total score computed for all scenarios.

Seven of the 18 original scenarios from the IRT were preserved, while the stories of three more IRT scenarios were retained but adapted to fit another reasoning process. 20 new scenarios were developed for the DRPT based on theoretical and clinical findings (Aardema & O'Connor, 2003, 2007; O'Connor, Aardema, & Pélissier, 2005). Scenarios for the DRPT reflect a broader range of OCD symptoms than those featured in the IRT. For example, unacceptable thoughts of sexuality and immorality, as well as the well-documented symptom domain of "just right" were added (Thordarson et al., 2004). Following the construction of the DRPT, two IBA experts served as expert raters for the DRPT and blindly rated all 30 scenarios based on OCD symptom categories and reasoning processes. Ratings were compared by the DRPT authors and revisions were applied until consensus was reached amongst the authors.

Vancouver Obsessional-Compulsive Inventory (VOCI). The VOCI (Thordarson et al., 2004) is a 55-item self-report questionnaire elaborated to measure OCD symptoms, including a range of obsessions, compulsions, avoidance behavior and associated personality characteristics. The instrument is composed of six analytically-derived component subscales: (a) obsessions, (b) checking, (c) contamination, (d) just right, (e) indecisiveness and (f) hoarding (Thordarson et al., 2004). Items are rated on a five-point Likert-type scale, ranging from 0 ('not at all') to 4 ('very much') to measure the participant's agreement with statements related to OCD (e.g., 'I am often very upset by my unwanted impulses to harm other people'). The VOCI has demonstrated excellent inter-item reliability in student, community, OCD and clinical control populations (Cronbach's α's = 0.96, 0.90, 0.94 and 0.98, respectively; Aardema et al., 2008). The VOCI has also shown convergent validity with similar measures of obsessionality, divergent validity with measures of distressed mood and excellent test-retest reliability in clinical and student samples (Radomsky et al., 2006).

Depression, Anxiety and Stress Scales-21 (DASS-21). The DASS-21 is a 21-item clinical self-report assessment used to measure depression, anxiety and stress levels experienced by a person over the past week (Lovibond & Lovibond, 1995). Psychometric properties for this scale have been excellent in a non-clinical population (Cronbach's α's of total score and subscale scores are 0.82 – 0.93; Henry & Crawford, 2005).

Fear of Self Questionnaire (FSQ). The FSQ is a 20-item self-report measure of the feared self construct rated on a 6-point Likert-type scale which ranges from "Strongly disagree" to "Strongly agree" (Aardema et al., 2013). This instrument measures the degree to which an individual fears they might be, or might become, a feared possible self. This feared self is characterized by hidden flaws and defects in one's character, morality, and sanity (e.g. "I fear perhaps being a violent, crazy person", "I feel like a bad part of me is always trying to express itself", "I fear becoming the sort of person I detest"). This instrument has strong internal consistency with Cronbach's $\alpha = 0.96$ (Aardema et al., 2013), and has demonstrated good divergent and convergent validity, including excellent associations with obsessional symptoms and cognitive processes found in OCD (e.g., threats, perfectionism and the importance of thoughts; Aardema et al., 2013; Melli et al., 2016).

Inferential Confusion Questionnaire – Expanded Version (ICQ-EV). The ICQ-EV is a 30-item self-report questionnaire developed to measure all three reasoning processes that give rise to inferential confusion on a 6-point Likert scale which ranges from "Strongly disagree" to "Strongly agree" (Aardema et al., 2010). Higher scores indicate an overreliance on dysfunctional reasoning processes and an increased tendency to confuse imagination with reality. The ICQ-EV has been validated in clinical and non-clinical samples (Aardema et al., 2010), showing significant

correlations with OC symptoms when controlling for negative affect (*r*'s = 0.38 – 0.68) and OCD belief domains (*r* = 0.40). The total scale has high internal consistencies ranging from 0.96 to 0.97.

The Obsessive Beliefs Questionnaire – 44-item version (OBQ). The OBQ is a 44-item self-report questionnaire that measures OC-relevant beliefs on a 7-point Likert-type scale from 1 (disagree very much) to 7 (agree very much; Obsessive Compulsive Cognitions Working Group [OCCWG], 2001). It contains subscales associated with OC-related beliefs: responsibility/threat estimation, perfectionism/intolerance of uncertainty, and importance of/control over thoughts. The internal consistency of the total score is excellent as reported in both clinical and non-clinical samples (Cronbach's α = 0.95). The OBQ is significantly correlated with OC symptomatology (*r*'s = 0.27 – 0.56; OCCWG, 2001).

Statistical Plan

The first hypothesis that inferential confusion, as measured by the DRPT, would relate significantly with convergent and divergent measures was investigated through correlational analyses. The second hypothesis that inferential confusion (DRPT) and feared self-perceptions would independently contribute to the prediction of OC symptoms (VOCI domain scores) was investigated through hierarchical multiple regression analyses with OC symptoms entered as the dependent variable; depression scores (DASS-21 Depression scale) entered as the independent variable in step one; and OC-related beliefs (OBQ), inferential confusion (DRPT), and feared self-perceptions (FSQ) entered as the independent variables in step two. This procedure was repeated for the six dependent variables: the VOCI total score, and the five VOCI symptom domains.

Finally, the third hypothesis that feared self-perceptions and OC-related beliefs would sequentially mediate the relationship between inferential confusion and OC symptoms was investigated through serial mediation models for simultaneous indirect effects using the PROCESS

script version 3.4 for SPSS (Hayes, 2017). In these serial mediation models, OC symptoms were entered as the dependent variable, inferential confusion was entered as the independent variable, and feared self-perceptions (FSQ) and OC-related beliefs (OBQ) were entered as the serial mediator variables. The sample distribution of indirect effects was bootstrapped 5000 times to provide non-parametric estimates of these sampling distributions, because smaller samples are prone to violating normality postulates required by mediation analyses (Preacher & Hayes, 2004; Williams & MacKinnon, 2008).

Results

Preliminary Analyses

The administration of the questionnaires was computerized without missing values for any of the measures utilized in the current study. Descriptive statistics were employed and the normality of data distribution was verified. Kurtosis and skewness were in an acceptable range for all variables (-1 to 1; Field, 2013).

Hypothesis 1: Correlations between Dysfunctional Reasoning and Other Constructs

Table 2 presents the Pearson correlations found between dysfunctional reasoning processes, as measured by the DRPT, and all other questionnaire constructs. A strong significant relationship was found between the DRPT and the ICQ-EV, which both measure inferential confusion (r = .65). Relatively strong relationships were found between the scores of the DRPT and the other constructs, with the OBQ as the strongest, and DASS-21 Depression scale, a divergent measure, as the weakest. The significance of the difference of correlation coefficients found between the DRPT and convergent measures, including the ICQ-EV, the OBQ, the FSQ and the VOCI, as compared to the correlation coefficients found between the DRPT and a divergent measure, the DASS-21 Depression scale, was calculated using the ZPF statistic. First, the

correlation found between the DRPT with the ICQ-EV (r = .65) was significantly stronger than the correlation found between the DRPT with the DASS-21 Depression scale (r = .35), ZPF (n = 172) = 3.77, p < .01. Second, the correlation found between the DRPT with the OBQ (r = .59) was significantly stronger than the correlation found between the DRPT with the DASS-21 Depression scale (r = .35), ZPF (n = 172) = 2.87, p < .01. Third, the correlation found between the DRPT with the FSQ (r = .56) was significantly stronger than the correlation found between the DRPT with the DASS-21 Depression scale (r = .35), ZPF (n = 172) = 2.46, p < .05. Lastly, the correlation found between the DRPT with the VOCI (r = .57) was significantly stronger than the correlation found between the DRPT with the DASS-21 Depression scale (r = .35), ZPF (n = 172) = 2.59, p < .01. Thus, conceptually convergent values were significantly stronger than conceptually discriminant values.

When limiting analyses to specific OC dimensions, relatively strong relationships were also found, with the Just Right domain as the strongest and obsessions as the weakest. Three of the five correlations found between the DRPT and specific OC dimensions (contamination, checking, and just right) were numerically higher, but not significantly stronger than the correlations found between the ICQ-EV and specific OC dimensions, as calculated using the ZPF statistic.

Hypothesis 2: Prediction of OC symptoms

Table 3 presents results from the series of hierarchical multiple regression models that were conducted to examine whether dysfunctional reasoning, as measured by the DRPT, and feared self-perceptions would significantly and uniquely predict OC symptom domains and overall OC symptoms even when controlling for depressive scores and OC-related beliefs. Before interpreting the results of the regression models, we confirmed for all four predictors that VIF values were < 4

(i.e., 1.31 – 1.99) and tolerance values were more than .2 (i.e., .50 – .76), suggesting that multicollinearity was not a concern (Field, 2013).

Scores on the DRPT significantly and uniquely predicted VOCI total scores and scores on the VOCI contamination, checking, just right, and indecisiveness subscales, independent of depressive scores and OC-related beliefs. Scores on the FSQ significantly and uniquely predicted scores on the VOCI obsessions and indecisiveness subscales, independent of depressive scores and OC-related beliefs. Finally, scores on the OBQ significantly and uniquely predicted VOCI total scores and scores on the VOCI contamination and just right subscales, independent of depressive scores.

Hypothesis 3: Mediation analyses.

The serial mediation model performed on the VOCI total score is presented in Figure 1 where numbers represent standardized coefficients. The total effect of DRPT on VOCI was significant, where $\beta = 0.57$, $SE = .08$, $t(172) = 9.15$, $p < .001$. Significant indirect effects in serial mediation models are characterized by 95% CIs that do not contain the value of 0. The indirect effect of DRPT on VOCI through FSQ was positive, statistically significant, and moderate in magnitude (indirect effect β coefficient = .15; 95% CI = .05 to .27). The indirect effect of DRPT on VOCI through OBQ was also positive, statistically significant, and moderate in magnitude (indirect effect β coefficient = .11; 95% CI = .02 to .23). The indirect effect of DRPT on VOCI through FSQ and OBQ was also positive, statistically significant, and small in magnitude (indirect effect β coefficient = .08; 95% CI = .02 to .14).

Serial mediation models were performed at the symptom dimension level on each of the VOCI subscales. The total effect of DRPT on VOCI contamination was significant, where $\beta = 0.45$, $SE = .02$, $t(172) = 6.64$, $p < .001$. The total effect of DRPT on VOCI checking was significant,

where β = 0.49, *SE* = .01, *t*(172) = 7.35, *p* < .001. The total effect of DRPT on VOCI obsessions was significant, where β = 0.44, *SE* = .02, *t*(172) = 6.38, *p* < .001. The total effect of DRPT on VOCI just right was significant, where β = 0.57, *SE* = .02, *t*(172) = 8.93, *p* < .001. The total effect of DRPT on VOCI indecisiveness was significant, where β = 0.52, *SE* = .01, *t*(172) = 8.0, *p* < .001. Table 4 presents the indirect effects of all the variables in these serial mediation models. The indirect effect of DRPT on the VOCI contamination and just right subscales through FSQ and OBQ were positive, statistically significant, and small in magnitude. The indirect effect of DRPT on the other VOCI subscales through FSQ and OBQ were not statistically significant.

Discussion

This study aimed to provide further support for the potential mechanisms between inferential confusion and feared self-perceptions in OC symptomatology. We developed the Dysfunctional Reasoning Processes Task (DRPT), a task-based measure covering a wider range of OCD-relevant dysfunctional reasoning processes relative to existing task-based instruments (i.e., Inverse Reasoning Task; IRT; Wong & Grisham, 2017b). Results showed that the DRPT had a strong and significant relationship with the ICQ-EV (*r* = .65), which is comparable to the association between the IRT and the ICQ-EV reported in a previous study (*r* = .62; Wong et al., 2019). Replicating results from previous studies where inferential confusion was measured by the IRT, (Wong et al., 2019; Wong & Grisham, 2017b), inferential confusion, as measured by the DRPT, was also significantly related to OC symptoms.

Our results generally supported the primary hypotheses. This study was the first to investigate all the dysfunctional reasoning processes proposed to give rise to inferential confusion per the inference-based approach by using a task-based measure (IBA; O'Connor, Aardema, & Pélissier, 2005). Inferential confusion was a significant and unique predictor of overall OC

symptoms in our non-clinical sample, which is consistent with previous findings where inferential confusion, as measured by the IRT, was a significant and unique predictor of overall OC symptoms in a larger non-clinical sample (Baraby et al., 2019). In addition, the DRPT was also a significant and unique predictor of all specific OC symptom dimensions, namely contamination, checking, just right, and indecisiveness, with the exception of the obsessions dimension, independent of depressive symptoms and OC-related beliefs. These findings generally support the IBA's central notion that obsessions arise as the result of dysfunctional reasoning processes regardless of symptom subtype (O'Connor & Aardema, 2012).

Feared self-perceptions were also significantly associated with OC symptoms, expanding on previous results from studies in both clinical and non-clinical samples (Aardema, Moulding, et al., 2017; Aardema, Wong, et al., 2018; Jaeger et al., 2015; Melli et al., 2016). While feared self-perceptions were not a significant and unique predictor of overall OC symptoms as seen in Baraby et al. (2019) with a larger non-clinical sample, feared self-perceptions were a significant predictor of specific OC symptoms of obsessions and indecisiveness, independent of depressive symptoms and OC-related beliefs. These results were expected and are consistent with findings from a recent study in OCD patients receiving psychotherapy, where treatment-related improvements on the FSQ significantly and uniquely predicted reductions in repugnant obsessions independent of negative mood states (Aardema, Wong, et al., 2018).

Similarly, the absence of an association between feared self-perceptions and overall OC symptoms is consistent with other findings, which Aardema, Wong, et al. (2018) have previously interpreted as a result of the predominant focus of the FSQ in its current form on repugnant obsessions. Surprisingly, feared self-perceptions were a significant and unique predictor of OC symptoms of indecisiveness. Based on the IBA conceptualization of the feared self, these findings

may be interpreted by the implication that one's perceived threat may come about as a result of distrusting the senses and going beyond reality, which may result in an increased tendency for the person to feel hesitant and irresolute towards their own self (Aardema & O'Connor, 2003, 2007; Aardema et al., 2009).

Relationships between the FSQ and OC symptom domains of checking or just right were not expected, given weak to non-significant relationships with these symptom domains in previous cross-sectional studies, and again because the FSQ in its current form does not delve into feared self-perceptions pertaining to these OC domains. As such, the FSQ is currently being expanded to include items measuring other feared self domains that may be particularly relevant for other OC symptom domains, such as contamination (e.g., "I fear others might be disgusted when they see me"), checking, and just right (i.e., the negligent, unreliable feared self; e.g., "I fear being someone who never does things right").

Our third hypothesis, namely that feared self-perceptions and OC-related beliefs would sequentially mediate the relationship between inferential confusion, as measured by the DRPT, and OC symptoms overall, was supported. Our results showed that this was particularly supported for specific OC symptoms of contamination and just right. Hence, the effect of dysfunctional reasoning processes on OC symptoms is partially direct, as it is also dependent on levels of feared self-perceptions and OC-related beliefs. Our findings thus provide converging support for the working model proposed in the editorial of this special issue, which places the feared self at the core of OCD development and maintenance (Aardema & Wong, 2019). Together with the present results, it appears that an increased reliance on the imagination during reasoning would facilitate the development of a feared self, which in turn would direct reasoning and the imagination towards negative and vulnerable self-themes. The feared self would sequentially drive the person to

appraise intrusions as threatening and significant to their self due to dysfunctional beliefs, hereby resulting in experienced distress, which the person would attempt to mitigate by performing compulsions. Without a feared self, our findings suggest that the effect of inferential confusion on OC symptoms may be attenuated.

These exploratory findings concurrently support the claim by the IBA model that cognitive beliefs and appraisals as currently measured may not completely account for the etiology of OCD (Julien et al., 2016). These beliefs, as measured by the OBQ, have been associated with a wide range of OC symptoms (OCCWG, 2001, 2003, 2005) and were significantly associated with OC symptoms in the current study in addition to being a significant predictor of overall OC symptoms and symptoms of contamination and just right. However, findings on the causal role of OC-related beliefs on OC symptoms have been mixed (Mantz & Abbott, 2017) and dysfunctional belief domains may not be specific to OCD (Anholt & Kalanthroff, 2014; Belloch et al., 2010; García-Soriano, Roncero, Perpiñá, & Belloch, 2014; Tibi et al., 2018; Viar, Bilsky, Armstrong, & Olatunji, 2011). Findings from the present study thus suggest that inferential confusion may be the primary vulnerability that acts as a driver in the development sequence of obsessional intrusions, but that both the presence of one's feared self-perceptions and subsequent OC-related beliefs may exacerbate one's intrusions and eventually result in the occurrence of compulsions.

Clinically-speaking, this study provides further converging evidence that modifying vulnerable self-themes is particularly relevant in existing cognitive-behavioural treatments for OCD (Aardema, Moulding, et al., 2017; Bhar & Kyrios, 2016), including inference-based cognitive therapy (Aardema, Wong, et al., 2018; O'Connor & Aardema, 2012). The effect of an overreliance on the imagination has direct negative effects in general on OC symptoms, while the effect of this overreliance may be particularly detrimental in the presence of a feared self,

particularly for symptom dimension levels of contamination and just right. Given its central proposed role in OCD, therapeutic outcomes might be improved if clinicians help clients develop a greater level of self-trust by helping them define their sense of self with information based in reality, and helping them discriminate between their actual and feared selves as outlined by Aardema & O'Connor (2007; O'Connor & Aardema, 2012). A central aspect of treatment based on this model consists of targeting dysfunctional reasoning processes that justify and give rise to the feared self. Specifically, it would show to clients that the feared self is not based on any valid reality-based criteria as evidenced by the presence of reasoning distortions (e.g., "psychopaths don't feel guilty, therefore I might be a psychopath", dismissal of actual evidence; e.g., "I never hurt anyone, but how can you truly know yourself when a lot of things happen unconsciously?"; and irrelevant associations, e.g., "I read someone suddenly went crazy, so I could go crazy"). Simultaneously, among a number of novel cognitive interventions as part of inference-based cognitive treatment, interventions based on this model include helping clients develop alternative self-related narratives in accordance with reality and common sense in order to strengthen the client's actual, authentic self; these types of approaches and targets are not at all inconsistent with cognitive-behavioral strategies that aim to re-evaluate appraisals or the beliefs and meanings that individuals ascribe to them.

Several study limitations require consideration. Although the DRPT was designed to be an exhaustive task-based measure of inferential confusion, further investigation using factor analysis may provide a more fine-grained understanding of the various reasoning components of inferential confusion. Clinicians have previously been able to differentiate between the different reasoning components of inferential confusion, as well as distinguish them from other cognitive domains (O'Connor, Koszegi, Goulet, & Aardema, 2013), but it is as of yet unknown whether these

reasoning components are factorially distinct in the current task-based measure. The high internal consistency of the DRPT may suggest otherwise, and the ICQ-EV, a self-report measure of inferential confusion, has previously revealed a unidimensional structure (Aardema et al., 2010). Regardless, the intent of this study was not to identify specific reasoning components of inferential confusion, but to develop a task-based measure of inferential confusion across the entire scope of its reasoning components, which share the common element of giving credibility to subjective hypothetical premises and imagined possibilities at the expense of reality during reasoning. Future research will need to establish whether these components of inferential confusion can be empirically differentiated from each other, or whether they are better understood as conceptually distinguishable, yet highly related aspects of inferential confusion.

Another limitation of this study is that most of the measures employed were based on self-report data, and remain subjected to information bias, such as social desirability (Althubaiti, 2016). Although the investigation of OC phenomena in a non-clinical sample is appropriate (Abramowitz et al., 2014; Gagné et al., 2018), clinical implications proposed by this study remain tentative. Future research should aim to replicate these results by comparing performance on the DRPT between different clinical groups to establish the relevance of dysfunctional reasoning processes to OCD populations. Future studies should also explore treatment-related improvements on the DRPT and whether this predicts successful treatment outcome among those with OCD.

The current study has provided further empirical evidence for the existence of dysfunctional reasoning processes on a task-based instrument and their relationship with feared self-perceptions and OC symptomatology, over and above depressive states and OC-related beliefs from other traditional cognitive models. Findings are consistent with the working model proposed in the editorial of this special issue which situates the feared self at the core of OCD development

and maintenance (Aardema & Wong, 2019). The present study highlights the increasingly explicit focus on modifying feared self-perceptions during psychotherapy and the need to establish clinical and theoretical relevancy of dysfunctional reasoning processes as specific to OCD in comparison to other disorders.

Contributors

Louis-Philippe Baraby: Conceptualization, Methodology, Formal analysis, Data curation, Writing – original draft, Project Administration.

Shiu F. Wong: Methodology, Formal analysis, Data curation, Writing – review & editing, Project Administration.

Adam S. Radomsky: Resources, Funding acquisition, Writing – review & editing.

Frederick Aardema: Conceptualization, Methodology, Resources, Statistics, Writing – review & editing, Supervision.

Role of Funding Sources

The current study was supported in part by grants (no. 156303) to the last author and to the third author (no. 153180) from the Canadian Institutes for Health Research (CIHR). The last author is also a recipient of a senior research scholar award from the Quebec Health Research Fund (Fonds de la recherche en santé du Québec; FRQS). The current special issue article was assigned to an independent editor and review. CIHR and FRQS had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Conflict of Interest

The authors have no conflict of interest to declare.

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Table 1

Demographics and Means and Standard Deviations for all Measures (*N* = 172)

Sample Demographics		Measures	
Gender	Female = 146 (84.9%)	DRPT	97.94 (28.68)
M_{age}	22.65 (4.96) years	FSQ	45.10 (22.90)
Marital Status	Single 89%	ICQ-EV	81.44 (35.92)
	Married / Common Law 10.5%	OBQ	134.44 (51.84)
	Separated / Divorced .6%	DASS-21 Depression scale	11.10 (9.88)
Ethnicity	Caucasian 65.7%	VOCI	37.84 (36.87)
	Other 34.3%		
Employment	Employed 15.1%		
	Other[a] 84.9%		
Education	Elementary .6%		
	Secondary 18.6%		
	Collegial 59.9%		
	Tertiary 20.9%		

Note. DRPT = Dysfunctional Reasoning Processes Task; FSQ = Fear of Self Questionnaire; ICQ-EV = Inferential Confusion Questionnaire – Expanded Version; OBQ = Obsessive Beliefs Questionnaire; D-Dep = Depression, Anxiety and Stress Scales – 21-item version, Depression scale only; VOCI = Vancouver Obsessional-Compulsive Inventory. [a] Includes students and those not working, retired, and unemployed.

Table 2

Zero-Order Correlations between Dysfunctional Reasoning Processes and Questionnaire Constructs and MacDonald's ω *for Each Scale* (main diagonal; N = 172)

	DRPT	FSQ	ICQ-EV	OBQ	Dep	VOCI	*Contamination*	*Checking*	*Obsessions*	*Just Right*	*Indecisiveness*
DRPT	.93										
FSQ	.56*	.99									
ICQ-EV	.65*	.70*	.98								
OBQ	.59*	.64*	.65*	.98							
Dep	.35*	.47*	.49*	.39*	.90						
VOCI	.57*	.55*	.57*	.57*	.48*	.97					
Contamination	.45*	.31*	.36*	.43*	.31*	.84*	.93				
Checking	.49*	.35*	.40*	.36*	.23*	.78*	.58*	.95			
Obsessions	.44*	.59*	.52*	.49*	.54*	.81*	.55*	.54*	.92		
Just Right	.57*	.50*	.56*	.59*	.42*	.93*	.76*	.68*	.66*	.90	
Indecisiveness	.52*	.57*	.63*	.53*	.51*	.83*	.58*	.60*	.65*	.77*	.89

Note. DRPT = Dysfunctional Reasoning Processes Task; FSQ = Fear of Self Questionnaire; ICQ-EV = Inferential Confusion Questionnaire – Expanded Version; OBQ = Obsessive Beliefs Questionnaire; Dep = Depression, Anxiety and Stress Scales – 21-item version, Depression scale only; VOCI = Vancouver Obsessional-Compulsive Inventory.
*$p < .001$.

Table 3

Linear Regression Model Results of Dysfunctional Reasoning, Feared Self-Perceptions, and OC Beliefs Predicting OC Symptoms ($N = 172$)

OCD symptom dimension	Step	Predictor	R^2	ΔR^2	B	*SE* B	β	95% CI for B
VOCI Total	1	D-Dep	.23	.23	1.77	.25	.48***	1.273, 2.267
	2	D-Dep	.47	.25	.82	.24	.22***	.350, 1.128
		OBQ			.16	.06	.22**	.048, .269
		DRPT			.37	.09	.29***	.181, .553
		FSQ			.23	.13	.14	-.025, .479
Contamination	1	D-Dep	.10	.10	.29	.07	.31***	.159, .429
	2	D-Dep	.25	.17	.14	.07	.15*	.001, .282
		OBQ			.05	.02	.25**	.012, .078
		DRPT			.10	.03	.30***	.043, .153
		FSQ			-.04	.04	-.09	-.112, .038
Checking	1	D-Dep	.05	.05	.15	.05	.23**	.054, .245
	2	D-Dep	.24	.20	.02	.05	.03	-.078, .117
		OBQ			.01	.01	.07	-.014, .031
		DRPT			.09	.02	.40***	.051, .127
		FSQ			.02	.03	.07	-.032, .072
Obsessions	1	D-Dep	.29	.29	.44	.05	.54***	.335, .543
	2	D-Dep	.45	.16	.26	.05	.31***	.150, .362
		OBQ			.02	.01	.10	-.009, .040
		DRPT			.02	.02	.08	-.018, .065
		FSQ			.12	.03	.33**	.061, .174
Just Right	1	D-Dep	.17	.18	.39	.06	.42***	.263, .518
	2	D-Dep	.43	.27	.16	.06	.17**	.036, .278
		OBQ			.05	.01	.31***	.026, .082
		DRPT			.09	.02	.29***	.044, .138
		FSQ			.03	.03	.07	-.036, .092
Indecisiveness	1	D-Dep	.26	.26	.29	.04	.51***	.214, .361
	2	D-Dep	.45	.20	.15	.04	.27***	.079, .225
		OBQ			.02	.01	.15	.000, .034
		DRPT			.04	.01	.21**	.012, .069
		FSQ			.05	.02	.23**	.017, .094

Note. DRPT = Dysfunctional Reasoning Processes Task; FSQ = Fear of Self Questionnaire; OBQ = Obsessive Beliefs Questionnaire; D-Dep = Depression, Anxiety and Stress Scales – 21-item version, Depression scale only; VOCI = Vancouver Obsessional-Compulsive Inventory.
*$p < .05$; **$p < .01$; ***$p < .001$.

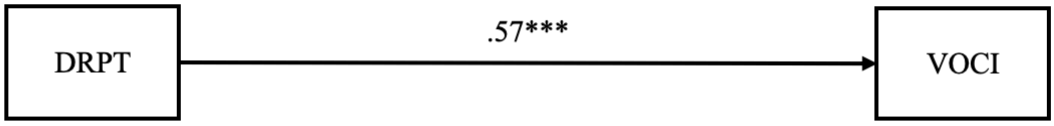
Table 4

Indirect Effects of the DRPT, FSQ and OBQ within Serial Mediation Models Predicting OC Symptoms (*N* = 172)

VOCI Subscale	**DRPT → FSQ → VOCI-Subscale**		**DRPT → OBQ → VOCI-Subscale**		**DRPT → FSQ → OBQ → VOCI-Subscale**	
	β	**95% CI**	β	**95% CI**	β	**95% CI**
Contamination	-.01	-.04, .02	.03	.01, .06	.02	.01, .04
Checking	.01	-.02, .04	.01	-.01, .03	0	-.01, .02
Obsessions	.07	.04, .10	.03	-.01, .03	.01	-.01, .02
Just Right	.02	-.01, .05	.04	.01, .07	.03	.01, .04
Indecisiveness	.04	.02, .05	.01	-.01, .03	.01	-.01, .02

Note. DRPT = Dysfunctional Reasoning Processes Task; FSQ = Fear of Self Questionnaire; OBQ = Obsessive Beliefs Questionnaire; VOCI = Vancouver Obsessional-Compulsive Inventory.

Total effect model



Indirect effect model

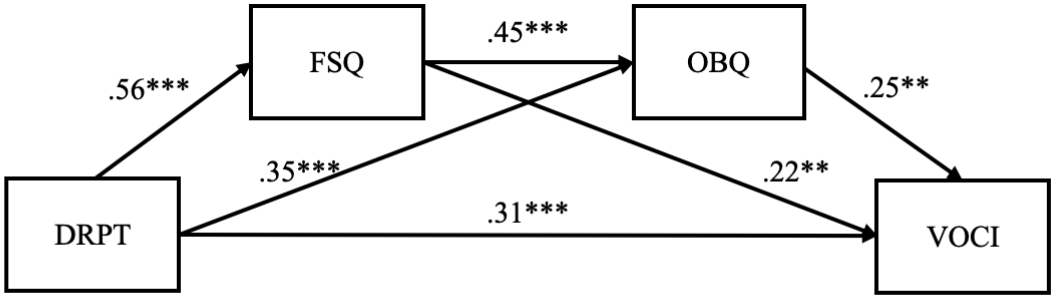


Figure 1. Mediation model with dysfunctional reasoning processes (DRPT) as the predictor variable; OC symptoms as the outcome variable (VOCI); and feared self-perceptions (FSQ) and OC-related beliefs (OBQ) as serial mediators. Numbers represent standardized coefficients. **p* < .05; ***p* < .01; ****p* < .001.

Appendix

Dysfunctional Reasoning Processes Task

Instructions : Please read the following scenarios as quickly and accurately as you can. For each scenario, rate your agreement with the logic of the reasoning, which is presented between quotation marks (“ ”) in each scenario. Please use only the information provided in the scenario to guide your rating.

Rating Scale

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree

#	**Scenario**	**Question**	**Rating** (1 to 7)
1	Scenario: Andy is jogging along the street and reaches a pedestrian crossing. As he is waiting to cross the road, he observes a recently installed bench across the road. He arrives at the bench and is about to rest on it when he suddenly thinks to himself, “This bench could have been touched by a lot of people, so it could be dirty.”	How much do you agree with the logic of Andy’s reasoning?	
2	Scenario: Felicia is sitting at her computer and reading about kitchen appliances on a website. One of the articles presents the story of a family home that burnt down due to a fire caused by faulty electrical wiring in a small kitchen appliance. Reminded of the toaster in her own kitchen, Felicia thinks to herself, “If that happened to someone else’s appliance, then it could also happen to my toaster.”	How much do you agree with the logic of Felicia’s reasoning?	
3	Scenario: Rose just moved into a new apartment and has almost finished unpacking her belongings. While putting away her books, she arranges them in a bookcase by colour. Once finished, she thinks to herself, “I can see that these books are perfectly organized by colour, but I might not see that one of them has found itself in the wrong colour order.”	How much do you agree with the logic of Rose’s reasoning?	
4	Scenario: Calvin is parked at the supermarket after shopping for groceries. He starts his car and slowly makes his way to the exit in the parking lot. As Calvin waits for an elderly person to slowly cross the road in front of him, he suddenly thinks to himself, “Perhaps I will totally lose it, and I might hit this elderly person with my car.”	How much do you agree with the logic of Calvin’s reasoning?	
5	Scenario: Dennis is looking at heterosexual pornography on his computer, as this normally excites him. He suddenly feels rather bored and finds himself looking at the physique of the man in the scene and admiring the shape and form of his body. He then thinks to himself, “Perhaps me not being	How much do you agree with the logic of Dennis’ reasoning?	

	interested in the woman in the scene and admiring the male's body means I might be gay."		
6	Scenario: Steve is at a party waiting for his best friends, Sam and John, to arrive. Sam and John are roommates and told Steve that they would travel to the party together and arrive at 7 p.m. Steve glances at his watch, which says it is five minutes to seven, and then thinks, "The train Sam and John are on could be broken down, so they might be late for the party."	How much do you agree with the logic of Steve's reasoning?	
7	Scenario: Brandon is with his girlfriend Lucy at her sister's wedding dinner. He knows that Lucy has prepared a speech for her sister to deliver before dessert is served. He leaves the table to let her prepare in quiet when he thinks, "Lucy appears calm, but perhaps she is hiding her anxiety and her mouth could be dry."	How much do you agree with the logic of Brandon's reasoning?	
8	Scenario: Carl is relaxing on a couch and reading a magazine. One of the articles discusses the high prevalence of people infected with hepatitis C, and how this virus can survive for weeks on surfaces. Carl then looks at his hands and thinks, "Viruses can survive outside of the body for weeks, so it could be on my hands right now."	How much do you agree with the logic of Carl's reasoning?	
9	Scenario: Melinda lives by herself in an apartment. She leaves her house and waits for a shuttle bus outside her apartment to take her to the airport as she needs to fly to New York for a five-day business trip. She is still waiting for the bus when she thinks, "The kitchen faucet could be leaking, so there might be water damage in my house when I return."	How much do you agree with the logic of Melinda's reasoning?	
10	Scenario: Mark receives a phone call from a colleague, Clara, who is normally very conscientious. She shares with him that she has just spent three hours regrading all of her exam copies because she miscalculated her students' grades. Mark, reminded of how he spent a long time grading his own students' exam copies, suddenly thinks to himself, "If Clara miscalculated her grades, I might not have calculated my grades perfectly either."	How much do you agree with the logic of Mark's reasoning?	
11	Scenario: Alice and a stranger are standing in line waiting for the bus on a busy road. Alice suddenly remembers hearing on the news that a man had pushed several people onto the street in front of a bus, seriously injuring them. Alice then immediately thinks, "If that man on the news pushed people in front of a bus, then I could do the same to this person in front of me."	How much do you agree with the logic of Alice's reasoning?	
12	Scenario: Diana recently moved into an apartment with a roommate and is setting up for a housewarming party for tonight. After she pours out some chips in a bowl and sets it on the table, she realizes that she forgot to buy cake and heads	How much do you agree with the logic of Diana's	

	out quickly to the nearby bakery. While shopping for a cake, she suddenly has the thought, "My roommate could be hungry, so he could have eaten all of the chips."	reasoning?	
13	Scenario: Dolores enters a bus on her first day to a new job wearing her best clothing. There is one empty seat left inside of the bus. Seeing that it looks clean, Dolores thinks to herself, "I may not see anything, but a lot of dirt is invisible, so it might still be dirty."	How much do you agree with the logic of Dolores' reasoning?	
14	Scenario: Sarah is leaving her apartment and inserts her key to lock the front door. It is an old lock and the key is difficult to turn. Sarah grabs the door knob and makes sure that the door is locked, but then thinks, "I can feel the door is locked, but perhaps the inside locking mechanism malfunctioned, so it could still be unlocked."	How much do you agree with the logic of Sarah's reasoning?	
15	Scenario: Sebastian is at work writing up an e-mail to his co-worker. He has reviewed it and clicked on "Send". Sebastian then thinks, "I can visually see on the computer screen that the e-mail has been sent, but maybe it got stuck in the outgoing message box without being sent."	How much do you agree with the logic of Sebastian's reasoning?	
16	Scenario: Denise has been promoted and transferred to another cubicle at work. This new space comes with an ergonomic desk chair that provides lavish adapted support, which Denise has just customized to her body. As she sits in the chair, Denise thinks to herself, "It would be easy to forget one of the options on this chair because there are so many, and so the chair might not be perfectly customized to my body."	How much do you agree with the logic of Denise's reasoning?	
17	Scenario: Jack was asked by his father to sharpen all the knives in the kitchen. After sharpening all the knives, Jack placed them back into the cutlery cupboard. He is sitting in the living room and then hears his father rummaging in the cutlery cupboard when he thinks, "One of the knives I sharpened could have cut my father's hand, so his hand might be injured".	How much do you agree with the logic of Jack's reasoning?	
18	Scenario: As Hugo is preparing dinner for his family and cutting up vegetables, his wife comes over, asks him if he needs any help and kisses him gently. Hugo then asks himself if he could hurt his wife with the knife he is holding. He then thinks to himself, "I don't feel violent, but I might unconsciously want to hurt her and I might be, deep down, a psychopath."	How much do you agree with the logic of Hugo's reasoning?	
19	Scenario: Eric is a university student and lives with a roommate, David. He arrives home from school and notices that David is sleeping on the couch in the living room. Eric takes special care not to make too much noise when he thinks, "David appears to be sleeping, but he might actually be feeling ill."	How much do you agree with the logic of Eric's reasoning?	

20	Scenario: Fred is out eating lunch with his co-worker, Linda. She tells him that she left her house in a hurry this morning and forgot to shut the garage door but that her husband was fortunately still at home. Fred, reminded of how he was also in a hurry this morning, thinks to himself, "If Linda forgot to shut her garage door, I might have left it open as well."	How much do you agree with the logic of Fred's reasoning?	
21	Scenario: Louis is looking for a house to buy and visits a home with a real estate agent. Nothing indicates the presence of mold, nor are there any other signs of leaks or mold on the walls and ceilings. Louis thinks to himself, "The house is beautiful and I do not see any signs of mold, but there might be mold behind the walls that I cannot see."	How much do you agree with the logic of Louis' reasoning?	
22	Scenario: Stephanie is sitting at a table in the food court. She becomes very tired while waiting for her friend to bring back food. She folds up her bare arms on the table to rest her head for a while when she has the sudden thought, "This table might have been cleaned with harmful chemicals, so my arms could be contaminated."	How much do you agree with the logic of Stephanie's reasoning?	
23	Scenario: Cindy is at work typing an important email for her client that needed to be phrased perfectly. She takes great care to word everything impeccably. Once she is done writing the e-mail and reviewing it, she thinks to herself, "I did not see any mistakes, but it is easy to miss mistakes when reviewing an email, and so it still might not be as it should be."	How much do you agree with the logic of Cindy's reasoning?	
24	Scenario: One of David's favorite hobbies is swimming at a local pool. One day, David witnesses two young boys changing in the locker room and suddenly finds himself looking at their naked bodies, staring at them a bit too long. David then thinks, "I do not feel attracted to these boys sexually, but I might have unconscious sexual desires towards children and might be a pedophile."	How much do you agree with the logic of David's reasoning?	
25	Scenario: Juliet is at work when her mother calls about this skirt she saw online and wants to buy for her. The skirt is available in various colours, and Juliet asks her mother to buy the skirt in blue. After hanging up the call, Juliet immediately thinks, "Last time I asked my mother to buy me something, she messed up my order, and so that might happen now as well."	How much do you agree with the logic of Juliet's reasoning?	
26	Scenario: Chris used to live with Bridget but now lives with a new roommate, Tim. It is 8 p.m. and he wants to call Tim out to watch a movie together. He is about to knock on Tim's closed door when he thinks to himself, "Bridget used to not like when I knocked on her door at this hour, and so Tim might not like it either."	How much do you agree with the logic of Chris' reasoning?	
27	Scenario: Joe has just washed, dried, folded and split his shirts into two piles so that he can put them away into his dresser.	How much do you agree with	

	When putting away the second pile, he notices that one of the shirts unfolds slightly. Joe thinks to himself, "If the shirts from the second pile weren't folded properly, the shirts in the first pile might not be folded correctly either."	the logic of Joe's reasoning?	
28	Scenario: At the end of each day, Jacob assists his staff with restocking the bookshelves at the library where he works. Once they are done, his assistant Helen mentions that they've never had such a large load of books to restock before. Jacob thinks to himself, "Some books may have been misplaced on the shelves, and thus some books might not be shelved perfectly as they should."	How much do you agree with the logic of Jacob's reasoning?	
29	Scenario: Nick is sitting in his office at work when he remembers that he had left an important document in his car in the parking lot. He returns to his car, retrieves the document, and then locks his car. As he is walking back towards the office he thinks, "I bet my car's locking mechanism might be faulty, and so my car might be unlocked."	How much do you agree with the logic of Nick's reasoning?	
30	Scenario: Louise is cleaning up at the end of her shift at the school cafeteria. She notices that one of the tables is dirty and wipes off the dirt with a cloth. She then looks at the seats around the table and thinks to herself, "If the table was dirty, then the seats might be dirty as well."	How much do you agree with the logic of Louise's reasoning?	

Article 2: The relevance of dysfunctional reasoning to OCD and its treatment: Further evidence for inferential confusion utilizing a new task-based measure[2]

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This research was supported in part by grants and fellowships from the Canadian Institutes of Health Research (CIHR) and Fonds de recherche du Québec – Santé (FRQS). Declarations of interest: none.

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[2]This is the accepted and published version of the following article: Baraby, L. P., Bourguignon, L., & Aardema, F. (2023). The relevance of dysfunctional reasoning to OCD and its treatment: Further evidence for inferential confusion utilizing a new task-based measure. *Journal of Behavior Therapy and Experimental Psychiatry*, *80*, 101728.

Abstract

Background and objectives

Previous research has highlighted the role of dysfunctional reasoning processes (i.e. "inferential confusion") in the development and maintenance of Obsessive-Compulsive Disorder (OCD). Inferential confusion has previously been found to be a unique predictor of OC symptoms and has shown specificity for OCD. However, these findings have primarily relied on a single self-report questionnaire, and only a limited number of experimentations have been conducted to establish the specificity of inferential confusion to OCD with alternate measures. The current paper demonstrates the relationship of inferential confusion with OCD symptoms in clinical samples by using a task-based measure of inferential confusion.

Methods

Sixty-four OCD participants, as well as thirty anxious and thirty-four healthy controls completed the recently developed Dysfunctional Reasoning Processes Task (DRPT) and related measures. Thirty-five OCD participants then completed sixteen sessions of cognitive-behavioural therapy (CBT) and completed the same measures post-treatment.

Results

As predicted, dysfunctional reasoning was significantly more elevated for those with OCD relative to control groups. Reduced levels of dysfunctional reasoning during CBT were significantly associated with successful treatment outcome.

Limitations

Clinical implications should be interpreted with caution due to the relatively small sample size.

Conclusions

Our findings support the notion that inferential confusion is an important cognitive factor particularly relevant to OCD that needs to be directly addressed as a mechanism of change in CBT.

Keywords: Inference-based approach; inferential confusion; fear of self; obsessive-compulsive disorder.

The relevance of dysfunctional reasoning to OCD and its treatment: Further evidence for inferential confusion utilizing a new task-based measure

1. Introduction

Obsessive-Compulsive Disorder (OCD) is a highly disabling psychiatric illness which causes individuals to suffer from recurrent intrusive thoughts or images (obsessions) and engage in repetitive behaviors (compulsions) aimed at eliminating distress or feared consequences of the obsessions (American Psychiatric Association [APA], 2013; Overduin & Furnham, 2012). A number of different models have been proposed to advance our understanding of the etiology of OCD, including the inference-based approach (IBA; Aardema & O'Connor, 2007; O'Connor, Koszegi, Aardema, van Niekerk, & Taillon, 2009). This cognitive model argues that obsessions are inferences of pathological doubt (e.g. "my hands *might be* contaminated") that are justified by the person through idiosyncratic narratives containing dysfunctional reasoning processes specific to OCD. Specifically, the IBA proposes that those with OCD tend to distrust their senses and display an overreliance on the imagination during reasoning, which leads them to give credibility to subjective hypothetical probabilities at the expense of reality. The model broadly describes this process as "inferential confusion" reflecting the notion that the person with OCD confuses something purely imaginary with a realistic probability when entertaining an obsessional doubt or possibility (Aardema, O'Connor, et al., 2005).

Research suggests that inferential confusion is an important cognitive factor in the development and maintenance of OCD (Aardema, Wong, et al., 2018; Aardema, Wu, et al., 2018; Aardema et al., 2010). Based on the literature, Aardema et al. (2019) recently proposed three conceptually-distinct and parsimonious categories of dysfunctional reasoning processes that give rise to a state of inferential confusion where the person confuses imagination with reality when

entertaining obsessional possibilities as if they a plausible probability without any actual evidence in reality, including: 1) *inverse reasoning*, 2) *the active dismissal and distrust of sensory information and self-knowledge,* and *3) out-of-context associations* (Baraby, Wong, Radomsky, & Aardema, 2021). *Inverse reasoning* refers to a cognitive structure that accentuates hypothetical possibilities when arriving at negative conclusions about reality. When a person employs inverse reasoning, observations about reality do not precede conclusions, which leads to hypothetical possibilities preceding observations about reality despite opposing evidence (e.g., "There might be bacteria on my hands, thus, they could be dirty and contaminate me"; Wong & Grisham, 2017b).

The active dismissal and distrust of sensory information and self-knowledge implies that a person considers their five senses to be fallible and fails to properly employ them to confirm their experiences by actively dismissing their own senses (e.g., "I may not see something, but a lot of things are invisible") or their self-knowledge in determining what is true or untrue (e.g., "I know I have never really hurt anyone, but perhaps I could"; Aardema & O'Connor, 2003). Finally, *out-of-context associations* involve a person misapplying information (e.g., categories, objects, people, events, or facts) to their own situation. During reasoning, a person will wrongly apply arbitrary information to justify their conclusions while having no direct evidence in the senses to support this association with their current situation (e.g., "My friend left his home earlier today without closing the door, so mine could also have been left open"; O'Connor, Aardema, & Pélissier, 2005).

These reasoning processes have previously been represented in psychometric measures to investigate their role in the development and maintenance of OCD. The Inferential Confusion Questionnaire – Expanded Version (ICQ-EV; Aardema et al., 2010) is the most frequently-employed self-report instrument in OCD research to measure reasoning processes reflecting inferential confusion with significant relationships with OCD symptoms across multiple studies

using OCD, clinical and non-clinical populations (Aardema et al., 2013; Aardema, O'Connor, et al., 2005; Aardema et al., 2008; Aardema, Wong, et al., 2018; Aardema & Wu, 2011; Aardema et al., 2010; Baraby et al., 2021; Paradisis et al., 2015; Wong & Grisham, 2017b). Previously, scholars have argued that the IBA has been primarily investigated using the ICQ-EV, which, due to its self-report nature, may be susceptible to response bias (Julien et al., 2016). To address this limitation, as well as to provide converging evidence for the role of inferential confusion in OCD utilizing varying methodologies, the Inverse Reasoning Task (IRT; Wong & Grisham, 2017b) was developed as a task-based instrument to measure one's endorsement of inverse reasoning. The IRT has shown significant relationships with OCD symptoms across OCD, anxious and non-clinical populations (Wong et al., 2019; Wong & Grisham, 2017b).

The main limitation of the IRT has been that it only covers one of the three key processes that compose inferential confusion. To address this limitation, a new task-based instrument, the Dysfunctional Reasoning Processes Task (Baraby et al., 2021), was recently developed as an expansion of the IRT to measure one's endorsement of all three dysfunctional processes identified in the inferential confusion literature. In the first study employing this measure, inferential confusion, as measured by the DRPT, was significantly related to OC symptoms in a non-clinical sample (r = .65; Baraby et al., 2021). The DRPT was also a significant and unique predictor of specific OC symptom dimensions, namely contamination, checking, just right, and indecisiveness, independent of depressive symptoms and OC-related beliefs, providing further converging evidence to the IBA's central notion that obsessions arise as the result of dysfunctional reasoning processes regardless of symptom subtype (O'Connor & Aardema, 2012).

Findings from studies employing the ICQ-EV and the IRT show that those diagnosed with OCD tend to score higher on inferential confusion than both non-clinical and clinical controls,

suggesting that those with OCD exhibit an increased tendency to confuse imagined possibilities with reality (Aardema, Emmelkamp, et al., 2005; Aardema et al., 2013; Aardema, O'Connor, et al., 2005; Aardema et al., 2008; Aardema, Wong, et al., 2018; Aardema & Wu, 2011; Aardema et al., 2010; Baraby et al., 2021; Paradisis et al., 2015; Wong & Grisham, 2017b; Wong et al., 2019). Furthermore, inferential confusion appears to be relevant to treatment outcome, as reductions in inferential confusion through psychotherapy are associated with reductions in OC symptoms (Aardema, O'Connor, et al., 2005; Aardema, Wong, et al., 2018). In addition, inferential confusion may also be implicated in the formation of feared self-perceptions underlying OCD symptomatology (Aardema & O'Connor, 2007; Aardema & Wong, 2020b; Baraby et al., 2021), although investigations into the unique contributions of these cognitive factors in the prediction of OC symptoms in clinical samples remain limited (Aardema, 2020; Moulding et al., 2014; O'Connor & Aardema, 2012). Thus, investigations remain scarce regarding how inferential confusion, feared self-perceptions and obsessive beliefs impact symptoms of OCD.

Aims and hypotheses

The current article describes a series of two studies focused on the role of dysfunctional reasoning processes in relation OC symptomatology, treatment outcome and related constructs. In particular, there is a need to establish the theoretical and clinical relevance of dysfunctional reasoning processes as specific to OCD through a comparison with other disorders and healthy populations utilizing varying methodologies (Wong et al., 2019; Baraby et al., 2021). Consistent with the theme of the current special issue, research on OCD should also employ tests that are experienced as important and meaningful to those with OCD to maximize high ecological validity in studying cognitive-behavioural factors in psychopathology research and its treatment (Radomsky & Rachman, 2004). Test variables that have no importance to the individual are

unlikely to reveal the peculiarities of obsessional information processing and reasoning, nor are they as likely to have direct and meaningful clinical implications.

To maximize ecological validity, the current study utilizes the recently-developed DRPT as a measure of inferential confusion that addresses several limitations of existing research. The DRPT consists of highly OCD-relevant scenarios reflecting dysfunctional reasoning in OCD-related areas of preoccupation and concerns, which given "the importance of importance" (Radomsky & Rachman, 2004), is expected to be particular well-suited to identify the role of dysfunctional reasoning processes in OC symptoms, as well as their role as a mechanism of change during cognitive-behavioural therapy (CBT).

In the first study, we aim to establish the relevance of dysfunctional reasoning in patients diagnosed with OCD as compared to clinical and non-clinical controls to expand on previous research that have highlighted the specificity of inferential confusion to OCD in comparison to clinical and community controls (Aardema et al., 2010; Wong et al., 2019). Based on the literature, it was hypothesized that: (1) inferential confusion, as measured by the DRPT, would relate significantly with symptoms of OCD and related measures; (2) reasoning processes would be significantly more elevated on the DRPT for the OCD group relative to clinical and non-clinical control groups; (3) reasoning processes and feared self-perceptions would significantly and uniquely predict OC symptoms even when controlling for negative mood states and OC beliefs among those with OCD. In the second study, we aim to investigate the relationship between improvements in dysfunctional reasoning with treatment outcome among those with OCD. It was hypothesized that: (1) CBT leads to significant improvements in dysfunctional reasoning (2) level of improvement in dysfunctional reasoning during CBT is significantly associated with successful treatment outcome.

2. Study 1

2.1.Method

2.1.1. Participants

Participants were recruited at the Obsessive-Compulsive Research Laboratory (OCD-RL) located at the *Montreal University Institute Research Center* (MUIRC). The study received ethics approval from the local ethics board. All participants provided informed consent. This study contains a sample of 128 participants divided in three groups (see Table 1 for sample demographics): (1) OCD group (*n*=64), (2) anxiety disorder control group (*n*=30; see Table 2 for DSM-5 Diagnoses); and (3) healthy control group (*n*=34).

Participants with OCD were recruited from an ongoing randomized clinical trial (RCT) at OCD-RL. The entry criteria for each of the three participant groups were: (1) minimum 18 years of age; (2) fluency in French; (3) no evidence of current suicidal intent or substance abuse. Additional entry criteria for the OCD group were: (1) a primary diagnosis of OCD; (2) no evidence of current or past psychotic symptoms, schizophrenia, bipolar disorder or organic mental disorder; (3) no change in medication during the 12 weeks before treatment for antidepressants and four weeks for anxiolytics; (4) willingness to keep medication stable during treatment; (5) not undergoing another psychological treatment during their participation in the study; (6) willingness to undergo active psychological treatment and randomization into a treatment modality. Entry criteria for the clinical control group were: (1) a primary diagnosis of an anxiety disorder. Entry criteria for the healthy control group was: (1) no past or present psychiatric diagnosis.

2.1.2. Measures

Dysfunctional Reasoning Processes Task (DRPT). The DRPT (Baraby et al., 2021) is a task-based instrument developed to measure one's endorsement of the three main reasoning

processes known to give rise to inferential confusion where an individual gives credibility to an inference about a state-of-affairs in reality despite the lack of any actual sensory evidence for its relevance in the here and now including 1) inverse reasoning, 2) the active dismissal and distrust of sensory information and self-knowledge, and 3) out-of-context associations (O'Connor, Aardema, & Pélissier, 2005). The DRPT was elaborated to contain scenarios that are meaningful and important for those with OCD, which was further corroborated by expert clinicians during its development, to ensure that the task would be high in ecological validity (Radomsky & Rachman, 2004). The task includes 30 scenarios where a character displays the use of a reasoning process when confronted with a situation, 24 scenarios involving OCD-relevant concerns (i.e., contamination, checking, just right, and unacceptable thoughts), and six scenarios reflecting non-OCD-relevant concerns (e.g., punctuality). It has produced a strong reliability in a non-clinical sample (MacDonald's $\omega = 0.93$) and has demonstrated good divergent and convergent validity, including strong relationships with obsessional symptoms and cognitive processes found in OCD (Baraby et al., 2021).

Vancouver Obsessional-Compulsive Inventory (VOCI). The VOCI (Thordarson et al., 2004) is a 55-item self-report questionnaire conceived to measure symptoms of OCD, including obsessions, compulsions, avoidance behavior and associated personality characteristics. The questionnaire includes six analytically-derived component subscales: (a) contamination, (b) checking, (c) just right, (d) obsessions, (e) indecisiveness, and (f) hoarding (Thordarson et al., 2004). The VOCI has shown excellent inter-item reliability in student, community, OCD and clinical control populations (Cronbach's α's = 0.96, 0.90, 0.94 and 0.98, respectively; Aardema et al., 2008).

Fear of Self Questionnaire (FSQ). The FSQ (Aardema et al., 2013) is a 20-item self-report questionnaire elaborated to measure the "feared self" construct rated on a Likert 6-point scale which ranges from "Strongly disagree" to "Strongly agree". This questionnaire has produced a strong reliability with Cronbach's α = 0.96 (Aardema et al., 2013) and demonstrated good divergent and convergent validity, including excellent relationships with obsessional symptoms and cognitive processes found in OCD (e.g. threats, perfectionism and the importance of thoughts; Aardema et al., 2013; Melli et al., 2016).

Inferential Confusion Questionnaire – Expanded Version (ICQ-EV). The ICQ-EV (Aardema et al., 2010) is a 30-item self-report questionnaire developed to measure the three reasoning processes known to give rise to inferential confusion in OCD based on the IBA. Higher scores indicate an overreliance on dysfunctional reasoning processes and an increased tendency to confuse imagination with reality. The ICQ-EV has been validated in both clinical and non-clinical samples (Aardema et al., 2010), showing significant correlations with OCD belief domains (r=0.40) and OC symptoms when controlling for negative affect (r = 0.38–0.68). It has high internal consistencies ranging from 0.96 to 0.97 (Aardema et al., 2010).

The Obsessive Beliefs Questionnaire – 20-item version (OBQ). The OBQ (Moulding et al., 2011) is a self-report questionnaire that measures OC-relevant beliefs on a 7-point scale from 1 (disagree very much) to 7 (agree very much). It is composed of four subscales that have shown adequate psychometric properties (α >.80) in both non-clinical and clinical samples: (a) overestimation of threat; (b) responsibility; (c) perfectionism/intolerance of uncertainty; and (d) importance of/need to control thoughts (Moulding et al., 2011; Fergus & Carmin, 2014).

Beck Depression Inventory – II. The BDI-II (Beck, Steer, & Brown, 1996) is a 21-item instrument developed to measure the severity of depressive symptoms experienced by participants

during the 2 weeks prior to completion. The BDI-II has shown to be highly reliable and a valid measure of depressive symptoms (α = .92–.93; Beck et al., 1996).

Beck Anxiety Inventory. The BAI (Beck, Epstein, Brown, & Steer, 1988) is a 21-item anxiety intensity symptom questionnaire ("last week," 0–3 scale). This instrument has demonstrated high internal consistency (α = 0.91), good test-retest reliability (r = 0.75), moderate convergent validity with the revised Hamilton Anxiety Rating Scale (r = 0.51) and good discriminant validity with the Hamilton Depression Rating Scale (r = 0.25; Aardema et al. 2010; Beck et al., 1988).

2.1.3. Procedure

Control participants were recruited through social media, and screened by telephone by a trained graduate student using a structured questionnaire (Kirouac, Denis, & Fontaine, 2006). Those with OCD were recruited as part of an ongoing large-scale RCT during which they were administered the DRPT and related measures before and after CBT treatment. All participants were assigned a unique identification code and password to access the online questionnaire package hosted online by the Checkbox software program.

2.1.3.1.Procedure: OCD and clinical control groups only

Following the telephone pre-screening, participants provided informed consent online. Eligible individuals for the OCD group were evaluated by independently trained evaluators using the *Structured Clinical Interview for DSM-5 Disorders* (SCID-5-RV; First, Williams, Karg, & Spitzer, 2015). Eligible individuals for the clinical control group were evaluated using the *Diagnostic Interview for Anxiety, Mood and Obsessive-Compulsive and Related Neuropsychiatric Disorders* (DIAMOND; Tolin et al., 2018). Participants were then invited to complete the battery of measures online at a single point in time. OCD participants received no financial compensation

for their participation (see Study 2 for more details). Clinical controls were debriefed, thanked and received a $50 compensation via e-transfer.

2.1.3.2.Procedure : Healthy control group only

Following the telephone pre-screening, eligible individuals received a link to complete an online questionnaire package anonymously. Prior to beginning the questionnaires, participants were prompted to provide informed consent. They completed the battery of measures at a single point in time. Upon completion, participants were debriefed, thanked and entered in a draw for a $50 online gift card.

2.2.Results

2.2.1. Preliminary Analyses and Sample Characteristics

Data were analyzed using SPSS 27.0. The administration of the questionnaires was computerized without missing values. Descriptive statistics were utilized and the normality of data distribution was verified. Kurtosis and skewness were in an acceptable range for all variables (-1 to 1; Field, 2013). A chi-square test confirmed that groups did differ in gender distribution, $\chi^2(2, N = 128) = 19.22$, $p < 0.001$, $\varphi_c = .39$. A univariate analysis of variance (ANOVA) indicated that groups significantly differenced in age, $F(2, 125) = 7.57$, $p < 0.001$, $\eta^2 = 0.11$. Bonferroni-corrected post-hoc comparisons indicated that the OCD group was significantly older than the clinical control group ($p < 0.05$), and that the healthy controls were significantly older than the clinical controls ($p < 0.001$). Since gender distribution in OCD has been found to be relatively equal (Lochner & Stein, 2001), results below are presented without gender and age as statistical controls as they are not of primary interest to the current study.

Multivariate ANOVA was conducted to determine whether the three groups differed with regards to OCD symptoms (VOCI), depressive and anxious symptoms (BDI-II, BAI), feared self-

perceptions (FSQ), inferential confusion (ICQ-EV) and OC beliefs (OBQ). Using Pillai's Trace, there was a significant effect of groups on all these measures, $F(12, 242) = 7.92$, $p < 0.001$, $\eta^2 = 0.28$. The univariate ANOVA conducted on OCD symptoms was significant ($F(2, 125) = 40.18$, $p < 0.001$, $\eta^2 = 0.39$). Post-hoc comparisons indicated that the OCD symptoms for the OCD group were significantly more elevated relative to both control groups (ps < 0.001), suggesting successful OCD group assignment based on the diagnostic procedure. The univariate ANOVAs conducted on anxious ($F(2, 125) = 15.92$, $p < 0.001$, $\eta^2 = 0.20$) and depressive symptoms ($F(2, 125) = 17.56$, $p < 0.001$, $\eta^2 = 0.22$) were both significant. Post-hoc comparisons indicated that anxious and depressive symptoms were not significantly more elevated for the anxious controls relative to OCD participants (p=.45 and p=.84, respectively), but were significantly more elevated relative to healthy controls (ps<0.001). The univariate ANOVAs conducted on the OBQ ($F(2, 125) = 21.66$, $p < 0.001$, $\eta^2 = 0.26$), the ICQ-EV ($F(2, 125) = 25.91$, $p < 0.001$, $\eta^2 = 0.29$) and the FSQ ($F(2, 125) = 17.52$, $p < 0.001$, $\eta^2 = 0.22$) were significant. Post-hoc comparisons indicated that the OCD group scored significantly higher on the OBQ and ICQ-EV compared to anxious ($p < 0.01$ and $p < 0.001$, respectively) and healthy controls (ps < 0.001), while the OCD group scored significantly higher on the FSQ than healthy controls, but not anxious controls ($p < 0.001$ and p=.0.08, respectively).

2.2.2. Hypothesis 1

Table 3 presents the *Pearson* correlations found between dysfunctional reasoning processes, as measured by the DRPT, and all other questionnaire constructs. Strong relationships were found between the scores of the DRPT and other measures, with the VOCI as the strongest, and the BAI and BDI-II as the weakest. The DRPT was strongly related to the ICQ-EV (r = .46).

With regards to specific OC dimensions, moderate to strong relationships were found, with the indecisiveness domain as the strongest and obsessions as the weakest.

2.2.3. Hypothesis 2

A multivariate ANOVA was employed to test for differences in DRPT scores between the three participant groups. Using Pillai's Trace, there was a statistically significant difference on the endorsement of dysfunctional reasoning for the DRPT total score and subscales (OCD scenarios and non-OCD scenarios) based on groups, $F(4, 250) = 12.68$, $p < 0.01$, $\eta^2 = 0.20$. Separate univariate ANOVAs for the total scale and subscales were also significant (ps < 0.01; see Table 4 for results). Given our a priori hypotheses, we examined three planned contrasts for each univariate ANOVA (i.e., OCD vs. clinical controls, OCD vs. healthy controls, clinical vs. healthy controls). Post-hoc comparisons indicated that DRPT total scores were significantly higher for the OCD group relative to anxious controls ($p = 0.02$) and healthy controls ($p < 0.001$), and for the anxious controls relative to healthy controls ($p < 0.01$). For the OCD scenarios only, post-hoc comparisons indicated that dysfunctional reasoning was also significantly higher for the OCD group relative to anxious controls ($p < 0.01$) and healthy controls ($p < 0.001$), and for the anxious controls relative to healthy controls ($p < 0.01$). For the non-OCD scenarios only, post-hoc comparisons indicated that dysfunctional reasoning was significantly higher for the OCD group relative to the healthy control group ($p = 0.01$), and for the anxious controls relative to healthy controls ($p < 0.01$), but not for the OCD group relative to anxious controls ($p = 0.46$).

2.2.4. Hypothesis 3

Table 5 presents results from the series of hierarchical multiple regression models that were conducted for the OCD group. Before interpreting results, we confirmed that multicollinearity was not a concern for the four predictors (i.e. VIF values were below 4 (1.38-1.97); tolerance values

were more than .2 (.51-.72); Field, 2013). Where a suppression effect was suspected with independent variables negatively predicting dependent variables despite positive zero-order correlations, the predictor was removed from regression analysis models, and subsequently rerun without that variable. DRPT scores significantly and uniquely predicted VOCI total scores and scores on the checking, just right, and indecisiveness subscales, independent of BDI and OBQ scores. FSQ scores significantly and uniquely predicted scores on the VOCI obsessions subscales, independent of BDI and OBQ scores. Scores on the OBQ did not significantly predict VOCI total scores or any of its subscales.

3. Study 2

3.1.Method

3.1.1. Participants

This second study was conducted with a sample of 35 participants diagnosed with OCD recruited through an ongoing RCT conducted at OCD-RL. Recruitment entry criteria and evaluation procedure of OCD participants were identical to the criteria and evaluation procedure described in Study 1 (see section *2.1.1. Participants*). The final sample consisted of 22 females and 13 males. The average age was 36.3 years (SD=12.83). Educational levels were distributed as follows: 2.85% elementary, 8.57% high school, 20% college (i.e. CÉGEP in Québec), 45.71% Bachelor's degree, 22.86% Master's degree or higher.

3.1.2. Measures

Participants completed the same battery of measures described in Study 1 (see section *2.1.2 Measures*), with the exception of the FSQ (Aardema et al., 2013).

3.1.3. Procedure

Eligible participants provided informed consent. Participants were randomized and administered 16 sessions of one of two cognitive-behavioral treatments, namely (1) Inference-Based Cognitive-Behavioral Therapy (I-CBT; O'Connor & Aardema, 2012; *n*=18), or (2) Exposure and Response Prevention Therapy (ERP; Foa, Yadin, and Lichner (2012); *n*=17). Both treatments consisted of two evaluation sessions for case formulation and treatment planning followed by 16 weekly sessions of individual therapy delivered by licensed therapists according to published guidelines (O'Connor and Aardema (2012) for I-CBT; Foa et al. (2012) for ERP). The OCD participants completed the battery of measures before and after completing treatment. All participants were assigned a unique identification code and password to access the online questionnaire package hosted online by the Checkbox software program.

3.2.Results

3.2.1. Hypothesis 1

The hypothesis that CBT would lead to significant improvements in dysfunctional reasoning was tested by comparing pre- and post-treatment mean scores with paired *t* tests on all measures. Table 6 presents the paired *t* tests results for the total sample size that showed a significant difference in the pre- and post-treatment DRPT scores, as well as the other measures used in the current study. A medium effect size was found for the DRPT (Cohen's *d* of 0.39), indicating that it is a sensitive instrument to measuring improvements in dysfunctional reasoning. In addition, significant improvements were observed in OCD symptoms and related measures including OC-related beliefs and mood states. No improvements were observed on the ICQ-EV.

3.2.2. Hypothesis 2

The hypothesis that higher levels of improvement in dysfunctional reasoning would be significantly associated with successful treatment outcome was tested by comparing DRPT mean

change scores with a one-way ANCOVA whilst controlling for treatment type (e.g. I-CBT and ERP). Participants were assigned to one of two groups, responders and non-responders, based on reliable change utilizing the procedure outlined by Jacobson and Truax (1991), which produced a reliable change criterion of 16.17. According to this criterion, 51.4% of participants (n = 18) achieved reliable improvement as the result of treatment. Levene's test and normality checks were carried out and assumptions were met. There was a significant difference in DRPT mean change scores ($F(1, 32)=11.11$, $p<0.01$) between treatment responders and non-responders whilst adjusting for the covariate treatment type, which was not significant ($p>0.05$). The estimated marginal means showed that the highest levels of improvement in dysfunctional reasoning was for treatment responders (M=33.01; SD=8.00) compared to non-responders (M=-5.25; SD=8.23).

We also used the same method to examine the DRPT subscales of non-OCD scenarios and OCD scenarios. There was a significant difference in the mean change scores of the DRPT non-OCD scenarios subscale ($F(1, 32)=9.44$, $p<0.01$) between treatment responders and non-responders whilst adjusting for the covariate treatment type, which was not significant ($p>0.05$). The estimated marginal means showed that the highest levels of improvement in dysfunctional reasoning was for treatment responders (M=6.44; SD=10.95) compared to non-responders (M=-4.53; SD=9.87). There was also a significant difference in the mean change scores of the DRPT OCD scenarios subscale ($F(1, 32)=10.94$, $p<0.01$) between treatment responders and non-responders whilst adjusting for the covariate treatment type, which was not significant ($p>0.05$). The estimated marginal means showed that the highest levels of improvement in dysfunctional reasoning was for treatment responders (M=26.39; SD=26.29) compared to non-responders (M=-.53; SD=22.81).

We tested whether higher levels of improvement in OBQ and ICQ-EV scores would be significantly associated with successful treatment outcome by comparing OBQ and ICQ-EV mean changes scores with one-way ANCOVA whilst controlling for treatment type. There was no significant difference in OBQ mean change scores ($F(1, 32)=1.14$, $p>0.05$) nor in ICQ-EV mean change scores ($F(1, 32)=1.36$, $p>0.05$) between treatment responders and non-responders whilst adjusting for the covariate treatment type ($p>0.05$). The mean change scores on the OBQ were 21.22 (SD=22.28) for the treatment responders and 13.76 (SD=19.93) for non-responders. The mean change scores on the ICQ-EV were 17.0 (SD=28.50) for the treatment responders and 3.47 (SD=38.07) for non-responders.

4. Discussion

In a series of two studies, we aimed to establish the relevance of inferential confusion in the development and maintenance of OCD. First, we compared its endorsement by those diagnosed with OCD relative to clinical and non-clinical controls. Second, we investigated the relationship between improvements in dysfunctional reasoning with treatment outcome among those with OCD. Results showed that the DRPT had a significant and moderately strong relationship with the ICQ-EV (r = .46) in an OCD sample. This is lower, but comparable to the association between the DRPT and the ICQ-EV reported in a previous study employing the DRPT in a non-clinical sample (r = .65; Baraby et al., 2021), which provides support for an adequate level of convergent validity of the DRPT. Also, the DRPT was significantly related to OC symptoms in an OCD sample, replicating results from previous studies where inferential confusion was measured by the DRPT and the IRT (Baraby et al., 2021; Wong et al., 2019; Wong & Grisham, 2017b).

Results generally supported the primary hypotheses. Inferential confusion was not only significantly related to OCD symptoms, but also uniquely predicted these symptoms. Further,

scores on the DRPT were significantly more elevated for the OCD group relative to both non-clinical controls and an anxiety disorder group. Together with previous findings (Wong et al., 2019), these results provide converging evidence that inferential confusion is characteristic of those with OCD. In addition, results showed that where non-OCD-relevant concerns were prompted on the DRPT, those with OCD did not score higher than clinical controls. Among those with OCD, this suggests that inferential confusion is elevated in OCD-relevant situations and themes, while their reasoning is relatively intact in other areas of life. As evidenced by our findings, this may be true for other clinical groups as well, such as those with anxiety disorders, as inferential confusion may be elevated in situations especially relevant to their disorders, while their reasoning may be relatively intact in other areas of life. This selectivity is often drawn upon in inference-based cognitive therapy (I-CBT; Aardema, Wong, et al., 2018; O'Connor & Aardema, 2012) to highlight inconsistency of obsessional doubt given that the person usually reasons differently and normal in non-obsessional situations. Yet, results did show that even in neutral situations, those with OCD still scored higher than non-clinical controls, similar to those with an anxiety disorder. Hence, while dysfunctional reasoning may be less profound in non-obsessional situations for those with OCD, inferential confusion may occur across a diverse range of situations.

Although we had no a priori predictions about the differences in level of dysfunctional reasoning for the two control groups, scores on the DRPT for the anxiety disorder group were significantly more elevated than the scores for the healthy control group. This contradicts results from a recent study (Wong et al., 2019) employing the IRT, which found no differences in inferential confusion scores between an anxiety disorder and healthy control group. One possible explanation might be that the IRT only covers one of the three reasoning processes, thereby being a circumscribed measure of inferential confusion, whereas the DRPT is a more exhaustive task-

based measure of inferential confusion by covering all three processes from the IBA literature. Furthermore, while inferential confusion may be particularly elevated among those with OCD, it may also be a transdiagnostic factor that is present in varying degrees in other psychopathologies, such as depression, anxiety, body dysmorphic disorder and eating disorders as proposed by various authors (Aardema, O'Connor, et al., 2005; Blais, Bodryzlova, Aardema, & O'Connor, 2016; O'Connor, Ouellet-Courtois, & Aardema, 2018; Ouellet-Courtois, Aardema, & O'Connor, 2021; Wong et al., 2019).

Our hypothesis regarding the ability of both the DRPT and the FSQ to predict OC symptoms independent of depressive symptoms and OC-related beliefs was confirmed. Inferential confusion was a significant and unique predictor of OC symptoms in our OCD sample, replicating findings from a previous study employing the DRPT in a non-clinical sample (Baraby et al., 2021). In addition, the DRPT was a significant and unique predictor of specific OC symptom dimensions, namely checking, just right, and indecisiveness. No unique predictions were found in the prediction of contamination and obsessions, which were more strongly accounted for by feared-self perceptions, the latter which in itself is a construct that has previously been linked to inferential confusion (Aardema & Wong, 2020). Overall, these findings provide further evidence to the IBA's central notion that inferential confusion leads to obsessional doubt not limited to any specific symptom subtype (O'Connor & Aardema, 2012).

Feared self-perceptions were also significantly associated with OC symptoms for the OCD sample, expanding on previous findings from studies employing both clinical and non-clinical samples (Aardema, Moulding, et al., 2017; Aardema, Wong, et al., 2018; Baraby et al., 2021; Jaeger et al., 2015; Melli et al., 2016). While feared self-perceptions were not a significant and unique predictor of overall OC symptoms, they did significantly and uniquely predict obsessions

independent of depressive symptoms and OC-related beliefs. These results are consistent with previous findings highlighting the important role of feared self-perceptions among those with repugnant obsessions (Aardema, Moulding, et al., 2017).

Our treatment outcome hypotheses, namely that CBT would lead to significant improvements in dysfunctional reasoning, and that level of improvement would be significantly associated with treatment outcome, were confirmed. This was investigated by comparing change scores in dysfunctional reasoning for treatment responders and non-responders controlled for treatment type (I-CBT or ERP). Findings demonstrate that those who successfully responded to treatment showed significantly higher levels of improvement in dysfunctional reasoning than those who did not respond to treatment. The independence of this effect regardless of treatment type adds further strength to this finding. That is, since inferential confusion is directly targeted in I-CBT, it might be argued that these associations are an artifact. However, there was a significant relationship between improvements in dysfunctional reasoning outcome whether or not the person received I-CBT or ERP. In other words, improvement in dysfunctional reasoning is an important marker for outcome even if not directly addressed during treatment.

Results also showed that the DRPT is a sensitive instrument to measuring improvements in inferential confusion during treatment with significant differences before and after treatment. Although we did not have a priori predictions for the performance of the ICQ-EV, a self-report questionnaire of inferential confusion, this measure did not show significant change in pre- and post-treatment mean scores, which is inconsistent with previous findings (Aardema et al., 2010; Aardema, O'Connor, Delorme, & Audet, 2017). It is possible that the DRPT and ICQ-EV, while related, measure different aspects of inferential confusion with the DRPT more focused on specific situations of dysfunctional reasoning, whereas the ICQ-EV contains items that often reflect a more

generalized tendency towards inferential confusion. While current results require further investigation and replication, results do suggest that the DRPT might be the more sensitive instrument to detect cognitive change as the result of treatment, as well as differentiate between responders and non-responders in comparison.

The current study provides further evidence that modifying dysfunctional reasoning endorsement and vulnerable self-themes is particularly relevant in existing CBT for OCD (Aardema, Moulding, et al., 2017; Bhar & Kyrios, 2016; Baraby et al., 2021), including I-CBT (Aardema, Wong, et al., 2018; O'Connor & Aardema, 2012). Given that our findings show that inferential confusion may act as a mechanism of change during psychotherapy to achieve successful outcome in OCD symptom reduction, therapeutic outcomes may be improved by helping clients focus on reality-based information by further trusting their senses and decreasing their reliance on the imagination during reasoning (Aardema & O'Connor, 2007; O'Connor & Aardema, 2012). The DRPT may be an effective tool for clinicians to determine their clients' initial overreliance on the imagination during reasoning in order to develop case formulation and an individualized treatment plan.

While the current study was the first to replicate an investigation using the DRPT in clinical samples, there were a number of limitations. Sample sizes were relatively small, increasing the chance of type II errors. In addition, the clinical controls significantly differed in socio-demographics compared to the OCD and healthy participants, which might have affected the results and outcomes. Hence, both the absence and presence of any significant relationship should thus be interpreted with caution and further replication of results should aim to use larger sample sizes with increased statistical power. Also, since our findings and previous research support the notion that inferential confusion may be a transdiagnostic process, future studies could investigate

the precise role of inferential confusion in different psychological disorders by expanding the DRPT and matching stimuli to disorder-specific concerns.

While evidence has consistently shown that those with OCD score higher on inferential confusion than anxious and depressed controls utilizing the ICQ (Aardema, O'Connor, et al., 2005; Aardema et al., 2010; Wong et al., 2019), which has no specific reference to specific OCD-related concerns, the DRPT mostly reflects dysfunctional reasoning in specific OCD-related themes and concerns. Whereas this increases the ecological validity of the task, the current findings do not exclude the possibility that inferential confusion may not be present to an equal degree in concerns and domains specific to other anxiety disorders (e.g. inferential confusion specific to a fear of spiders, or social phobia). Future research will need to investigate this possibility more directly, like for example, through an appropriately powered study comparing effect sizes between inferential confusion in anxiety disorder-specific scenarios with scenarios specific to OCD-related concerns and themes. Given previous findings, while inferential confusion is likely elevated among those with anxiety disorders, especially with respect to disorder-specific concerns, we still expect inferential confusion to be the most relevant for those with OCD as compared to most other clinical disorders.

In sum, the current study was the first to longitudinally investigate a wider range of dysfunctional reasoning processes proposed to give rise to inferential confusion per the IBA using a new task-based measure, which supported the role of inferential confusion as a relevant and important process in OCD and its treatment. The present study highlights the need to further advance clinical and theoretical understanding of inferential confusion and the further development and validation of effective treatment strategies for OCD.

Author Contributions

Louis-Philippe Baraby: Conceptualization, Data curation, Formal analysis, Methodology, Statistics, Writing – original draft, Project Administration.

Lysandre Bourguignon: Writing – review & editing.

Frederick Aardema: Conceptualization, Funding acquisition, Methodology, Resources, Statistics, Writing – review & editing, Supervision.

Role of Funding Sources

The current study was supported in part by grants (no. 156303) to the last author from the Canadian Institutes for Health Research (CIHR). The last author is also a recipient of a senior research scholar award from the Quebec Health Research Fund (Fonds de la recherche en santé du Québec; FRQS). The current article was assigned to an independent editor and review. CIHR and FRQS had no role in the study design, collection, analysis or interpretation of the data, writing the manuscript, or the decision to submit the paper for publication.

Conflict of Interest

The authors have no conflict of interest to declare.

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Table 1

Demographics for the Three Participant Groups (*N* = 128)

Demographics	OCD (*n* = 64)	Anxious controls (*n* = 30)	Healthy controls (*n* = 34)
Sex	Female = 42 (65.6%)	Female = 28 (93.3%)	Female = 14 (41.2%)
M_{age}	35.39 (12.92)	27.87 (5.32)	40.26 (16.62)
Marital Status			
- *Single*	65.6%	96.7%	35.3%
- *Married / Common Law*	32.8%	3.3%	52.9%
- *Separated / Divorced / Widowed*	1.6%	--	11.7%
Ethnicity			
-*White*	89.1%	80%	91.2%
- *Middle Eastern Descent*	4.7%	6.7%	2.9%
- *Other*	6.2%	13.3%	5.9%
Employment			
- *Student*	15.6%	66.7%	17.6%
- *Full-time work*	57.8%	26.7%	47.1%
- *Other*[a]	26.6%	6.6%	35.3%
Education			
-*Elementary*	1.6%	--	--
-*Secondary*	12.5%	10%	2.9%

-*Collegial*	28.2%	26.7%	14.7%
-*Tertiary*	57.9%	63.3%	82.4%

Note. [a] Includes those working part-time, those not working, retired, unemployed and those unable to work due to disability.

Table 2

DSM-5 Diagnoses for the Anxiety Disorder Control Group (*N* = 30)

Diagnosis	*N* (%)
Generalized Anxiety Disorder	19 (63.3%)
Panic Disorder	2 (6.7%)
Social Anxiety Disorder	8 (26.7%)
Agoraphobia	1 (3.3%)

Table 3

Zero-Order Correlations between Dysfunctional Reasoning Processes and Questionnaire Constructs and MacDonald's ω *for Each Scale* (main diagonal; OCD group only, $N = 64$)

	DRPT	FSQ	ICQ-EV	OBQ	BDI-II	BAI	VOCI	*Contamination*	*Checking*	*Obsessions*	*Just Right*	*Indecisiveness*
DRPT	.91											
FSQ	.51**	.96										
ICQ-EV	.46**	.62**	.97									
OBQ	.42**	.61**	.46**	.93								
BDI-II	.25*	.48**	.32*	.46**	.92							
BAI	.27*	.29*	.35**	.45**	.49**	.94						
VOCI	.63**	.41**	.41**	.37**	.52**	.50**	.93					
Contamination	.18	-.14	.07	-.02	.22	.27*	.61**	.95				
Checking	.54**	-.01	.17	.15	.14	.19	.64**	.25*	.95			
Obsessions	.39**	.75**	.44**	.52**	.43**	.44**	.44**	-.10	-.06	.94		
Just Right	.53**	.30*	.25*	.26*	.40**	.31*	.84**	.34**	.68**	.16	.90	

Indecisiveness	.55**	.44**	.48**	.30*	.55**	.37**	.80**	.32*	.48**	.34**	.73**	.84

Note. DRPT = Dysfunctional Reasoning Processes Task; FSQ = Fear of Self Questionnaire; ICQ-EV = Inferential Confusion Questionnaire – Expanded Version; OBQ = Obsessive Beliefs Questionnaire; BDI-II = Beck Depression Inventory - II; BAI = Beck Anxiety Inventory; VOCI = Vancouver Obsessional-Compulsive Inventory.
*$p < .05$; **$p < .01$.

Table 4

Group Means, Standard Deviations and Test Statistics for the DRPT and its subscales ($N = 128$)

	Group								
	OCD ($n = 64$)		Anxious controls ($n = 30$)		Healthy controls ($n = 34$)				
	M	*SD*	*M*	*SD*	*M*	*SD*	$F(4)$	*p*	n^2_p
DRPT	104.11	32.43	88.70	23.69	66.24	25.40	19.25	< 0.001	.24
OCD-S	83.69	26.47	67.10	18.68	49.82	19.93	24.12	< 0.001	.28
N-OCD	20.42	7.88	21.60	6.40	16.41	6.45	4.92	< 0.001	.07

Note. DRPT = Dysfunctional Reasoning Processes Task; OCD-S = DRPT OCD scenarios only; N-OCD = DRPT Non-OCD scenarios only.

Table 5

Linear Regression Model Results of Dysfunctional Reasoning, Feared Self-Perceptions, and OC Beliefs Predicting OC Symptoms (OCD group only, $N = 64$)

OCD symptom dimension	Step	Predictor	R^2	ΔR^2	B	*SE* B	β	95% CI for B
VOCI Total	1	BDI-II	.28	.28	1.57	.52	.524***	.92, 2.22
	2	BDI-II	.55	.27	1.29	.43	.430***	.67, 1.91
		OBQ			-.03	-.02	-.023	-.31, .25
		DRPT			.59	.57	.572***	.38, .80
		FSQ			-.09	-.08	-.078	-.38, .20
Contamination	1	BDI-II	.05	.05	.28	.15	.22	-.03, .58
	2	BDI-II	.105	.06	.35	.17	.28*	.01, .69
		OBQ			-.12	.07	-.24	-.18, .12
		DRPT			.09	.06	.21	-.03, .20
Checking	1	BDI-II	.02	.02	.11	.09	.142	-.08, .29
	2	BDI-II	.29	.28	.04	.09	.053	-.14, .22
		OBQ			-.03	.04	-.114	-.11, .04
		DRPT			.14	.03	.57***	.08, .20
Obsessions	1	BDI-II	.19	.19	.49	.43	.432***	.23, .75
	2	BDI-II	.57	.39	.08	.07	.073	-.15, .31
		OBQ			.04	.08	.077	-.07, .14
		DRPT			.00	.00	.002	-.08, .08
		FSQ			.30	.67	.668***	.19, .40
Just Right	1	BDI-II	.16	.16	.40	.40	.399***	.17, .64
	2	BDI-II	.36	.21	.34	.34	.340**	.10, .59
		OBQ			-.02	-.05	-.053	-.13, .09
		DRPT			.18	.51	.511***	.09, .26
		FSQ			-.04	-.09	-.089	-.15, .08
Indecisiveness	1	BDI-II	.30	.30	.29	.55	.550***	.18, .41
	2	BDI-II	.50	.20	.25	.47	.470***	.14, .37
		OBQ			-.03	-.15	-.154	-.09, .02
		DRPT			.09	.47	.465***	.05, .13
		FSQ			.02	.07	.074	-.04, .07

Note. DRPT = Dysfunctional Reasoning Processes Task; FSQ = Fear of Self Questionnaire; OBQ = Obsessive Beliefs Questionnaire; BDI-II = Beck Depression Inventory – II; VOCI = Vancouver Obsessional-Compulsive Inventory.

*$p < .05$; **$p < .01$; ***$p < .001$.

Table 6

Descriptive Statistics, Cronbach's α for Each Scale and t Test Results (N=35)

Measures	Cronbach's α Pre	Cronbach's α Post	Mean Pre (SD)	Mean Post (SD)	*t*
DRPT	.92	.96	95.89 (34.79)	81.46 (39.57)	2.21*
VOCI total	.94	.96	69.03 (33.68)	50.60 (32.49)	4.05***
ICQ-EV	.97	.96	93.06 (41.12)	82.63 (42.98)	1.83
OBQ	.95	.98	71.51 (31.08)	53.91 (30.49)	4.91***
BDI-II	.92	.94	14.91 (11.09)	8.94 (9.94)	3.14***
BAI	.94	.94	15.69 (14.12)	7.89 (9.74)	3.87***

Note. DRPT = Dysfunctional Reasoning Processes Task; VOCI = Vancouver Obsessional-Compulsive Inventory; ICQ-EV = Inferential Confusion Questionnaire – Expanded Version; OBQ = Obsessive Beliefs Questionnaire; BDI-II = Beck Depression Inventory – II; BAI = Beck Anxiety Inventory.
*$p < .05$; ***$p < .001$.

General Discussion

Summary of Objectives

Previous research using the IBA has repeatedly shown that inferential confusion plays an important role in the development and maintenance of OCD and that improvements in dysfunctional reasoning are associated with successful treatment outcome (Aardema, Emmelkamp, et al., 2005; Aardema & O'Connor, 2012; Aardema, O'Connor, et al., 2017; Aardema, Wong, et al., 2018; O'Connor, Aardema, Bouthillier, et al., 2005; Visser et al., 2015). Furthermore, recent conceptualizations on the role of the feared self as a core self-construct in the development and maintenance of OCD (Aardema & Wong, 2020a) suggest that dysfunctional reasoning might facilitate the development of feared self-perceptions, which would in turn drive the misinterpretation of obsessional intrusions, and result in the occurrence of compulsions.

Despite the ever-growing body of research highlighting the importance of inferential confusion and feared self-perceptions in the development of OCD, investigations remain scarce. In particular, there is a need to establish the theoretical and clinical relevance of dysfunctional reasoning processes as specific to OCD through a comparison with other disorders and healthy populations utilizing varying methodologies that are not limited to self-report questionnaires, such as task-based instruments. Indeed, task-based instruments constitute a more naturalistic measure of inferential confusion, given that they measure inferential confusion in action. By contrast, self-report tools, such as the Inferential Confusion Questionnaire – Extended Version (Aardema et al., 2010), rely on an individual's self-assessment of inferential confusion, which may introduce biases, such as the individual's level of insight into their own situation (Catapano et al., 2010). Finally, there is a scarceness of longitudinal investigations into improvements in the full range of dysfunctional reasoning processes and their relationship with successful treatment outcome among

those with OCD. Hence, the principal objective of the present thesis was to investigate the relationship of dysfunctional reasoning processes (i.e. inferential confusion) in relation to feared self-perceptions, OC symptomatology and its treatment outcome.

Summary of Findings

The present thesis provides cross-sectional and longitudinal support for the role of dysfunctional reasoning processes utilizing a new task-based measure of inferential confusion in relation to feared self-perceptions in OCD and its treatment.

Article 1. Investigations into inferential confusion in OCD have primarily relied on self-report measures, and investigations into inferential confusion in relation to feared self-perceptions remain scarce. Also, previous investigations only pertain to a limited number of reasoning processes in inferential confusion (i.e. inverse reasoning) and failed to cover the entire spectrum of processes proposed to be relevant to OCD. In the present study, a new task-based measure, the Dysfunctional Reasoning Processes Task (DRPT), covering a wider range of dysfunctional processes, was used to investigate the relationship of inferential confusion with feared self-perceptions and symptoms of OCD. In this first thesis article, it was hypothesized that inferential confusion, as measured by the DRPT, would relate significantly with convergent and divergent self-report measures utilizing a non-clinical analogue sample. Results supported this hypothesis as the DRPT had a strong and significant relationship with the ICQ-EV ($r = .65$), which is comparable to the association between the IRT and the ICQ-EV reported in a previous study ($r = .62$; Wong et al., 2019). Furthermore, relatively strong relationships were found between the scores of the DRPT and the other constructs.

It was also hypothesized that inferential confusion and feared self-perceptions would independently contribute to the prediction of OC symptoms, even when controlling for depressive

symptoms and OC-related beliefs. This hypothesis was supported as inferential confusion, as measured by the DRPT, was a significant and unique predictor of all specific OC symptom dimensions, independent of depressive symptoms and OC-related beliefs. Overall, results were consistent with the IBA's central notion that intrusive obsessions may arise as the result of inferential confusion irrespective of symptom subtype (O'Connor & Aardema, 2012).

The hypothesis that feared self-perceptions would independently contribute to the prediction of OC symptoms was also supported by results demonstrating that feared self-perceptions were a significant predictor of specific OC symptoms of obsessions and indecisiveness, independent of depressive symptoms and OC-related beliefs. These results are of particular note as they converge with those of a recent study in OCD patients receiving psychotherapy where improvements in feared self-perceptions were associated with reductions in symptoms, while also controlling for negative mood states and OC-related beliefs (Aardema, Wong, et al., 2018).

Lastly, based on a working model of the role of the feared self by Aardema and Wong (2019), it was hypothesized that feared self-perceptions and OC-related beliefs would sequentially mediate the relationship between inferential confusion and OC symptoms (i.e., inferential confusion → feared self-perceptions → OC-related beliefs → OC symptoms). Results supported this hypothesis and the working model of the role of the feared self in OCD not only for OC symptoms overall, but also for specific OC symptoms of contamination and just right. Hence, the effect of dysfunctional reasoning processes on OC symptoms is partially direct, as it is also dependent on levels of feared self-perceptions and OC-related beliefs. These exploratory findings also support the claim by the IBA that cognitive beliefs and appraisals do not completely account for the etiology of OCD and that inferential confusion is an important additional factor to consider

in the development and maintenance of OCD (Julien et al., 2016). Overall, although further research is needed to replicate and expand on the findings of this initial study, especially in clinical samples, it provides further evidence of the interrelationship between dysfunctional reasoning and feared self-perceptions, and their potential relevance to treatment outcome.

Article 2. The first study of the second thesis article further extended findings of the first thesis article through two related studies. The first study of the second article investigated inferential confusion as measured by the DRPT in both non-clinical and clinical samples, including a comparison of dysfunctional reasoning between those with OCD with an anxious and a healthy control group. The second study of the second article investigated the impact of psychotherapy on dysfunctional reasoning and its relationship with treatment outcome.

Based on previous research that has highlighted the specificity of inferential confusion to OCD (Aardema et al., 2010; Wong et al., 2019), the primary aim of the first study of the second article aimed to determine if inferential confusion, as measured by the DRPT, was specific to OCD through a comparison with a control sample of individuals with anxiety disorders, and a second control sample composed of healthy individuals from the community. In addition, this study aimed to replicate findings as reported in the first article on the relationship of inferential confusion with symptoms of OCD and related measures in clinical OCD sample. Results showed that the DRPT was moderately strongly related to the ICQ-EV (r = .46), which albeit lower than the correlation observed in the non-clinical sample, indicated an adequate level of convergent validity. In addition, the DRPT was significantly related to OC symptoms in an OCD sample, replicating results from previous studies where inferential confusion was measured by the IRT (Wong et al., 2019; Wong & Grisham, 2017b), as well as those found in a non-clinical sample in the first thesis article.

It was also hypothesized that inferential confusion would be significantly more elevated for the OCD group relative to clinical and non-clinical control groups. This hypothesis was supported in that mean scores on the DRPT were significantly more elevated for the OCD group (*M* = 104.11, *SD* = 32.43) relative to both non-clinical (*M* = 66.24, SD = 25.40*)* and clinical controls (*M* = 88.70, *SD* = 23.69*)*. Together with previous findings (Wong et al., 2019), these results provide additional evidence that inferential confusion is characteristic of those with OCD. Also, results showed that where non-OCD-relevant scenarios were endorsed as logical on the DRPT, those with OCD did not score higher than the anxious control group. However, scores on the DRPT for the anxiety control group were significantly more elevated than the scores for the healthy control group. This pattern may suggest that while inferential confusion appears to be particularly elevated among those with OCD in scenarios that are typically relevant to this disorder, it may also be a transdiagnostic factor that is present in varying degrees in other psychopathologies as proposed by various authors (Aardema, O'Connor, et al., 2005; Blais et al., 2016; O'Connor et al., 2018; Ouellet-Courtois et al., 2021; Wong et al., 2019).

Finally, it was hypothesized that inferential confusion and feared self-perceptions would significantly and uniquely predict OC symptoms even when controlling for negative mood states and OC beliefs among those with OCD. This hypothesis was replicated and extended findings from the first thesis article due to the fact that both the DRPT and the FSQ predicted OC symptoms, with the exception of contamination symptoms, independent of depressive symptoms and OC-related beliefs in an OCD sample.

The second study aimed to longitudinally investigate the relationship between improvements in dysfunctional reasoning with treatment outcome among thirty-five individuals with OCD. It was hypothesized that CBT would lead to significant improvements in dysfunctional

reasoning. This hypothesis was supported with significant improvements in dysfunctional reasoning with a medium effect size found for the DRPT as the result of psychological treatment (Cohen's *d* of 0.39). This finding suggests that the DRPT is a sensitive instrument to measuring longitudinal changes in dysfunctional reasoning. Significant improvements were also observed in OCD symptoms and related measures, including OC-related beliefs and mood states.

It was also hypothesized that level of improvement in inferential confusion during CBT would be significantly associated with successful treatment outcome. Findings ($F(1, 32)=11.11$, $p<0.01$) indicated that those who successfully responded to treatment showed significantly greater levels of improvement on the DRPT ($M = 33.01$; $SD = 8.00$) than those who did not respond to treatment ($M = -5.25$; $SD = 8.23$), even when controlled for treatment type ($p>0.05$). These findings provide further evidence for the link between reductions in inferential confusion with successful treatment outcome (Aardema, Emmelkamp, et al., 2005; Aardema & O'Connor, 2012; Aardema, O'Connor, et al., 2017; Aardema, Wong, et al., 2018; O'Connor, Aardema, Bouthillier, et al., 2005; Visser et al., 2015), but established with novel task-based instrument with support for its utility to measure changes in dysfunctional reasoning following the course of treatment.

Theoretical Implications

The IBA is an etiological cognitive model of OCD that is complementary to traditional cognitive-behavioral models that posit that the origin of obsessions lies in the occurrence of intrusive cognitions and their appraisal (Rachman, 1997, 1998; Salkovskis, 1985, 1989, 1996). However, the IBA proposes that prior to the occurrence of these intrusions and appraisals, those with OCD distrust their own senses and display an overreliance on the imagination during reasoning, often despite evidence to the contrary in the here and now, which leads them to make faulty inferences of pathological doubt. Previous research has shown that this style of reasoning,

termed inferential confusion, is an important cognitive factor in the development and maintenance of OCD (Aardema, Wong, et al., 2018; Aardema, Wu, et al., 2018; Aardema et al., 2010). The results of the present thesis are consistent with previous findings, while significantly further extending our knowledge on the role of inferential confusion in OCD. In particular, this thesis was the first research project to longitudinally investigate a wide range of dysfunctional reasoning processes proposed to give rise to inferential confusion per the IBA using a new task-based measure. Results supported the role of inferential confusion as a relevant and important process in OCD and its treatment. Also, both the first and second thesis articles demonstrated that inferential confusion significantly predicts OC symptoms in both non-clinical and clinical OCD samples, independent of negative mood states and OC-related beliefs. In addition, inferential confusion was a significant predictor of most specific OC symptom dimensions, a finding that highlights the generalizability of the central notion of the IBA that obsessions arise as the result of dysfunctional reasoning processes regardless of symptom subtype (O'Connor & Aardema, 2012).

Although findings from both the first and second articles will need to be replicated, they support the claim by the IBA model that cognitive beliefs and appraisals as conceived by traditional cognitive-behavioral models of OCD do not completely account for symptoms of OCD. These beliefs, as measured by the OBQ, were associated with OC symptoms and specific dimensions in both the first and second articles and, in the second article, were significant unique predictors of overall OC symptoms and symptoms of contamination and just right. However, both inferential confusion and feared self-perceptions also uniquely predicted symptoms of OCD, suggesting that a belief and appraisal account of OCD alone might be insufficient. Indeed, some have argued that dysfunctional belief and appraisal domains are not characteristic of OCD (Anholt & Kalanthroff, 2014; Belloch et al., 2010; García-Soriano et al., 2014; Tibi et al., 2018; Viar et al.,

2011). In contrast, the current thesis, as well as other recent research (Wong et al., 2019), provide evidence that inferential confusion may be characteristic of those with OCD. First, the first thesis article demonstrated that the endorsement level of inferential confusion in a non-clinical population uniquely predicts the severity of specific symptom dimensions of OCD. Second, the first study of the second thesis article demonstrated that individuals with OCD endorse greater levels of inferential confusion than both clinical and non-clinical control groups. Finally, the second study of the second thesis article demonstrated that improvement in inferential confusion was a significant key marker in the success of psychotherapy for those with OCD even when controlling for type of treatment.

The findings of the current research also have implications pertaining to the measurement of inferential confusion as a cognitive construct. The DRPT is a task-based measure of inferential confusion that was developed to address several limitations of existing research on inferential confusion in OCD, including its strong reliance on self-report measurement and the limited range of OCD-relevant dysfunctional reasoning processes covered by existing measures. As others have noted (Radomsky & Rachman, 2004), research on OCD should utilize varying methodologies that maximize high ecological validity. The finding from the second thesis article that individuals with OCD endorsed greater levels of inferential confusion on the DRPT relative to both control groups highlights that this task-based measure employs test variables that are relevant to those with OCD and that they can reveal the peculiarities of obsessional reasoning. Indeed, the DRPT was developed specifically with OCD in mind to test dysfunctional reasoning in OCD-related areas of preoccupation and concerns by using OCD-relevant scenarios.

The longitudinal results from the second thesis article showed that the DRPT is a sensitive instrument to measuring successful treatment outcome. Findings highlight the need to employ

varying methodologies in measuring inferential confusion in OCD research, especially when considering that the ICQ-EV did not significantly detect cognitive change as the result of treatment, contradicting previous findings (Aardema et al., 2010; Aardema, O'Connor, et al., 2017). This finding might also put into question the convergent validity of both measures with respect to measuring change in reasoning as the result of treatment outcome. However, previous studies with the ICQ-EV had considerably larger sample sizes and were thus more adequately powered than the current study, which might account for the discrepancy. If so, the DRPT might be the more sensitive instrument to detect changes in inferential confusion. However, it is also possible that each instrument measures different aspects of inferential confusion. Indeed, the DRPT may be more focused on reasoning in specific OCD-related areas of preoccupation with scenarios explicitly describing symptom dimensions of contamination, just right, checking and unacceptable thoughts, whereas the ICQ-EV may be more focused on a generalized tendency towards inferential confusion with items such as "I sometimes come up with bizarre possibilities that feel real to me" and "My imagination can make me lose confidence in what I actually perceive" (Aardema et al., 2010). Therefore, the use of both instruments in OCD research is recommended until further experimental research has been conducted to establish a consistent pattern of results that can determine which of the two measures may be the most effective in measuring the inferential confusion construct.

The results of the studies in the current thesis also have theoretical implications on the potential role of inferential confusion as a transdiagnostic process. It has previously been suggested that inferential confusion could be present in varying degrees across various psychopathologies, such as depression, anxiety, body dysmorphic disorder and eating disorders (Aardema, O'Connor, et al., 2005; Blais et al., 2016; O'Connor et al., 2018; Ouellet-Courtois et

al., 2021; Wong et al., 2019). In fact, results from the second thesis article demonstrated that clinical controls endorsed significantly higher levels of inferential confusion than non-clinical controls. Based on our findings, we propose that inferential confusion may be elevated in situations especially relevant to their disorders. However, there is also reason to expect that inferential confusion is particularly characteristic and pertinent to OCD. Previous research using the ICQ-EV, which the DRPT is strongly related to in both thesis articles, has consistently shown elevated levels of inferential confusion among those with OCD as compared to anxious controls (Aardema, O'Connor, et al., 2005; Aardema et al., 2010; Wong et al., 2019). In addition, the items in the ICQ-EV do not have any specific reference to symptoms of OCD, and these differences therefore cannot be explained by a focus on disorder-specific concerns. Similarly, those with OCD scored significantly higher on the DRPT as compared to the anxious controls in the current study. However, it should be noted that the DRPT was specifically developed to have high ecological validity by focusing on dysfunctional reasoning in OCD-related domains. Consequently, differences in DRPT scores with other anxiety disorders do not necessarily indicate that dysfunctional reasoning is not present in domains specific to these anxiety disorders. Also, high levels of inferential confusion have been found in those with a delusional disorder, which is consistent with the notion of OCD representing a reasoning or belief disorder as opposed to an anxiety disorder (Aardema, O'Connor, et al., 2005). Hence, while elevated levels of inferential confusion might be expected in other disorders as well, especially in disorder-specific related concerns, we would still expect this construct to be the most relevant for those with OCD and other belief disorders.

The results of the studies carried out as part the current thesis also directly comment on the role of feared self-perceptions in the development and maintenance of OCD. In both thesis articles,

feared self-perceptions were significantly associated with OC symptoms, consistent with previous findings from studies employing both clinical and non-clinical samples where feared self-perceptions, as measured by the FSQ, were also significantly associated with OC symptoms (Aardema, Moulding, et al., 2017; Aardema, Wong, et al., 2018; Jaeger et al., 2015; Melli et al., 2016). Notably, feared self-perceptions were a significant predictor of specific OC symptoms of obsessions and indecisiveness, independent of depressive symptoms and OC-related beliefs, highlighting the important role of feared self-perceptions among those with repugnant obsessions (Aardema, Moulding, et al., 2017). Moreover, findings from the first thesis article provide preliminary support for the working model proposed by Aardema and Wong (2019) as they demonstrate that feared self-perceptions and OC-related beliefs sequentially mediate the relationship between inferential confusion and OC symptoms. Specifically, the person with OCD that endorses higher levels of inferential confusion would likely show increased levels of feared self-perceptions, which would sequentially drive the occurrence of obsessional intrusions, as well as the appraisal of these intrusions as threatening and significant to their self, giving rise to distress and neutralizing activities in the form of compulsive behaviors. Specifically, without a feared self, our findings suggest that the effect of inferential confusion on OC symptoms may be attenuated. These findings have important clinical implications as well.

Clinical Implications

First, the present findings support the notion that inferential confusion is an important cognitive factor particularly relevant to OCD that needs to be directly addressed as a mechanism of change during psychotherapy. Results from the second thesis article are consistent with those of previous authors (Aardema, O'Connor, et al., 2005; Aardema, Wong, et al., 2018) as they demonstrate that improvement in inferential confusion leads to reductions in OC symptoms and is

a significant marker for treatment outcome. Thus, our findings show that targeting inferential confusion directly during treatment is both pertinent and desirable.

The importance of inferential confusion in predicting outcome was independent of treatment type. This means that ERP, while being a behavioral intervention, also has cognitive effects associated with treatment outcome. It should be noted, however, that this does not conclusively prove that change during ERP principally occurs through changes in inferential confusion. It is conceivable that change in inferential confusion is a mere by-product of behavioral changes during treatment. Further, O'Connor and Audet (2019) have posited that ERP does in fact promote reality sensing because some of its interventions include asking the person to experience the anticipated consequences of OCD (e.g., the person with OCD is asked to face and accept reality as it currently is). Thus, ERP may bring about change in inferences despite not having inferential confusion as an explicit construct in its theory.

Nonetheless, results are consistent with the notion that change in inferential confusion is associated with treatment outcome even if not directly addressed during treatment. In other words, the current findings do not directly comment on the exact causes of these changes in inferential confusion as the result of type of treatment, except that these changes are associated with treatment outcome. An investigation on the exact differences between the role of inferential confusion in each respective treatment, and the potential benefits of addressing it directly during treatment likely requires larger samples in a head-to-head comparison between ERP and I-CBT, including a focus on the moderating influence of both cognitive and behavioral variables in establishing these outcomes.

It deserves noting, however, that although ERP is a first-line treatment of choice for OCD (Himle & Franklin, 2009), it can be difficult to tolerate by some clients due to its anxiety-induced

confrontation component and is met with high rates of treatment refusal and drop-out rates (Abramowitz, 2006; Foa, 2010; Maltby & Tolin, 2003; Öst et al., 2015; Leeuwerik et al., 2019). In contrast, I-CBT does not rely on formal exposure to effectuate change. Clinical findings have shown that I-CBT addresses the limitations of ERP (Neziroglu et al., 2006) and may bring a reduction in OC symptoms even for the most treatment-resistant OCD populations (Aardema, O'Connor, Delorme et Audet, 2017; Visser et al., 2015). As such, despite the effectiveness of ERP in reducing inferential confusion, I-CBT is a potentially more acceptable alternative to ERP to achieve a successful outcome in OCD symptom reduction.

Another clinical implication from the present findings is that vulnerable self-themes are particularly relevant and can be addressed during I-CBT (Aardema, Wong, et al., 2018; O'Connor & Aardema, 2012). Clinically-speaking, this suggests that clinicians should develop an individualized treatment plan focused on the specific feared self-perceptions that render the person vulnerable to symptoms of OCD in accordance with current treatment interventions based on I-CBT (Aardema & O'Connor, 2007; O'Connor & Aardema, 2012). In particular, clinicians may assist clients in defining their sense of self with information based in reality that allows them to discriminate between their actual and feared selves. A central aspect of therapy based on these guidelines consists of targeting inferential confusion as it justifies and gives rise to the feared self. Specifically, treatment would allow clients to understand that the feared self is not based on any valid reality-based criteria as evidenced by the presence of reasoning distortions (e.g., "psychopaths don't feel guilty, therefore I might be a psychopath", dismissal of actual evidence; e.g., "I never hurt anyone, but how can you truly know yourself when a lot of things happen unconsciously?"; and irrelevant associations, e.g., "I read someone suddenly went crazy, so I could go crazy"; O'Connor & Aardema, 2012). Simultaneously, interventions based on I-CBT include

helping clients develop alternative self-related narratives in accordance with reality and common sense in order to strengthen the client's actual, authentic self. We argue that the above interventions are not inconsistent, but are rather complementary to cognitive-behavioral strategies that aim to re-evaluate appraisals or the beliefs and meanings that individuals ascribe to them.

Another clinical implication of our findings relates to the DRPT as a sensitive instrument for measuring improvements in dysfunctional reasoning during psychotherapy with a high level of ecological validity. The scenarios contained in the DRPT reflect dysfunctional reasoning in specific OCD-related areas of preoccupation and concerns. This combined with its association with treatment outcome, the DRPT will be a useful tool to clinicians in determining their clients' initial overreliance on the imagination during reasoning in order to develop case formulation and an individualized treatment plan, but also to assess improvements in reasoning over the course of treatment. Since the instrument has been shown to be sensitive to therapeutic success in treatment responders and non-responders, clinicians may use the tool throughout treatment as well to adapt their strategies and help their clients by focusing on treatment-resistant areas (e.g. higher scores on OC-specific domains of the DRPT).

From a clinical transdiagnostic perspective, the concept of inferential confusion may apply on a continuum and be present across the general population and thus, across multiple disorders at the same time including OCD, anxiety disorders, depression, delusional disorders and eating disorders. On a continuum, inferential confusion may be part of how individuals arrive at dysfunctional beliefs or beliefs that go against reality in both delusional or psychotic disorders as well as OCD. In OCD, the information becomes typically an obsessional doubt, whereas in delusional disorders, the information becomes fixed. Indeed, research has shown that individuals with delusional disorders score as high on inferential confusion as those with OCD (Aardema,

O'Connor, et al., 2005). Theoretically, there are also similarities between the disorders regarding the role of imagination in their development and maintenance. For example, inferences are generated on an imaginary basis in both disorders, and such inferences would appear to be further removed from reality as compared to the inferences in other disorders like anxiety disorders or depression. These findings combined with the removal of OCD as an anxiety disorder in the DSM-5 (American Psychiatric Association, 2013) are consistent with the notion of OCD representing a reasoning or belief disorder as opposed to an anxiety disorder. Further, those with psychosis, for example, may experience unacceptable thoughts derived from dysfunctional reasoning, but a significant difference between these thoughts in someone experiencing psychosis versus someone living with OCD is that the senses in psychosis may not be adequately functioning while still being trusted (e.g. hallucinations), while it is believed that the senses in those with OCD function effectively despite the individual distrusting them. Hence, future research could employ adapted versions of the DRPT (i.e. disorder-specific content) to further investigate the transdiagnostic nature and continuum of inferential confusion across multiple psychopathologies.

Limitations and Strengths

There were a number of limitations to be considered when interpreting the results of the present thesis. Firstly, although the DRPT was designed with the purpose of encompassing a wider range of dysfunctional reasoning processes proposed to give rise to inferential confusion, it is unknown whether these reasoning components are factorially distinct from each other. The internal inconsistency of the DRPT tentatively suggests a unidimensional structure, similar to previous findings with the ICQ-EV (Aardema et al., 2010). However, the questionnaire still awaits further investigation into its underlying factor structure in larger clinical samples. It is possible that further investigation into the factor structure will reveal more specific and empirically distinguishable

reasoning processes representative of inferential confusion. Regardless, the high internal consistency of the DRPT observed in the present study, combined with evidence for its convergent validity suggest that its total represents a meaningful and reliable measure of the overall severity of dysfunctional reasoning in any given individual across different obsessional situations and concerns.

Second, the DRPT mostly reflects dysfunctional reasoning in specific OCD-related preoccupations and themes, which increases the ecological validity of the task. While this may be a strength for studying inferential confusion in OCD populations, as well as its use in measuring treatment outcome in these populations, it may also constitute a limitation with regards to interpreting findings concerning other psychopathologies, given that inferential confusion may be a transdiagnostic process. It is not known how an individual with a disorder other than OCD would react to DRPT scenarios that feature disorder-specific preoccupations and themes. For example, how would a socially anxious individual score on a DRPT scenario involving inferential confusion regarding a particular social threat? How would an individual displaying a specific phobia (e.g. ophidiophobia) score on a DRPT scenario involving said specific phobia (e.g. scenario employing inferential confusion in the context of the fear of snakes)? In other words, inferential confusion may be present to varying degrees in concerns and domains specific to other psychopathologies, and the current findings do not exclude this possibility. Regardless, based on previous research and the present findings, we would still expect that inferential confusion would be the most relevant for those with OCD relative to other clinical disorders. Further research is needed to establish whether inferential confusion will also be found to be characteristic of OCD compared to individually tailored scenarios relevant to other disorders.

Limitations about the samples recruited in both thesis articles should also be considered when interpreting the findings. The methodology and analyses did not control for the medication that could be consumed by participants in the OCD and the anxious group. It is thus possible that an effect of medication could have influenced the results. However, both the OCD and anxious participants were not excluded if they consumed medication, which means that such an effect may have been similar in both groups. The first thesis article employed a non-clinical sample consisting of undergraduate students. The investigation of OCD phenomena with non-clinical samples has been found to be appropriate (Abramowitz et al., 2014; Gagné et al., 2018). However, some of the findings from this study, including relationships between OC symptoms of contamination and checking and the DRPT and related constructs, were not replicated in our second thesis article when employing an OCD sample, which demonstrates that clinical implications proposed by non-clinical investigations always remain tentative until they are examined in clinical groups. Indeed, the OCD group showed a mean score of 14.44 for the contamination subscale (SD=13.68), which has a maximum score of 48, and a mean score of 11.98 for the checking subscale (SD=8.19), which has a maximum score of 24. These scores are slightly lower than what may be expected of an OCD sample for these VOCI subscales (Thordarson et al., 2004). It is thus possible that this OCD sample had fewer contamination and checking-related concerns than other OCD samples in other studies using the VOCI. Nonetheless, several findings were replicated in the OCD sample, including strong relationships between the inferential confusion and OC symptoms and that inferential confusion could predict OC symptoms.

Another strength of the second thesis article was its design, which aimed to understand the specificity of dysfunctional reasoning processes in OCD by comparing an OCD sample with both clinical and non-clinical control groups. However, a limitation of these groups were their sizes, as

they were relatively small, which increased the chance of type II errors. Furthermore, a limitation of these groups was that they differed in both gender and age distribution. Even though gender distribution in OCD has been found to be relatively equal (Lochner & Stein, 2001), future investigations with larger sample sizes should further investigate the role of sex and gender differences. In fact, many studies have indicated that men are more reluctant to seek help for mental health problems than women (Staiger et al., 2020), which can thereby make it generally difficult for researchers to recruit men in mental health research. This was particularly a limitation for the anxious control group in the second thesis article, with females accounting for 93.3% of the sample. The lack of statistical power rendered impossible any fine-grained analysis to investigate differences amongst gender on the main variables. Further, the samples used across the studies in this thesis were mostly composed of white females. We propose that future studies employing the DRPT should recruit participants across a wider range of genders (i.e. the entire continuum including trans and non-binary), ethnicities and socio-economic backgrounds to reflect the cross-cultural nature of the disorder. Although the prevalence and etiology of OCD has been found to be homogeneous across cultures and socioeconomic backgrounds (Matsunaga & Seedat, 2007), it is possible that results from this thesis may not be entirely replicated in a more ethnically varied sample. Based on previous research (Mathis et al., 2011), we propose that differences may be found amongst genders based on OCD subtypes (e.g. women scoring higher on contamination and aggressive repugnant obsessions, men scoring higher on just right, checking and sexual repugnant obsessions) and even based on DRPT symptom-specific scenarios.

Another limitation is that the possibility of disorder comorbidity for the OCD participants recruited cannot be entirely excluded from our findings. Indeed, while the anxious disorder group scored significantly lower than the OCD group on OCD symptoms, indicating adequate group

assignment, the anxious disorder group did not score significantly higher than the OCD group on the BAI. These findings highlight that OCD itself tends to generate anxiety symptoms for those who live with the disorder, as experienced distress is intrinsic to OCD (Julien et al., 2016). In addition, although OCD participants were included in the study only after having been formally evaluated as having OCD as a primary diagnosis, our findings also demonstrate the strong comorbidity of OCD with other disorders, such as anxiety disorders (Clark, 2004). The potential impact of these small sample sizes, differences in distribution, and potential comorbidities should be kept in mind when considering the implications of both the absence and presence of any significant relationship in our findings. Also, the fact that we did not exclude participants with comorbid disorders in our OCD sample speaks of the generalizability and clinical relevance of the current findings.

The undertaking of this thesis was approved shortly before the start of the COVID pandemic. The health safety measures imposed by the *Ministère de la Santé et des Services sociaux* in Québec had implications on the design of this thesis. Specifically, participant evaluations and the administration of psychotherapy for OCD participants were originally meant to be conducted in face-to-face meetings, but were conducted by videoconference using Zoom Health to ensure the safety of all involved. As the primary interest of this thesis was not to investigate the impact of conducting research by videoconference as opposed to in-person, these variables were not further investigated. While differences in findings cannot be entirely excluded, recent preliminary findings from the fields of OCD (Goetter, Herbert, Forman, Yuen, & Thomas, 2014; Matsumoto et al., 2020; Schröder et al., 2020; Wheaton, Patel, Andersson, Rück, & Simpson, 2021), as well as from research in anxiety, depression and post-traumatic stress disorder (Fernandez et al., 2021; Fletcher

et al., 2018), suggest that CBT may be just as effective for most individuals when it is delivered via videoconferencing than in-person.

Although online survey software is an increasingly frequent tool due to facilitating participation and ease-of-use (Magro, Prybutok, & Ryan, 2015), a limitation should be considered. While the questionnaires were ordered differently in the first thesis article, this was not the case in the second thesis article. Thus, sequence effects were not controlled in the second thesis article, which means that we cannot exclude that the presentation of one questionnaire before another may have impacted our findings. However, any potential effect should be constant for all participants and each measure was analyzed independently.

Finally, a limitation of the present thesis is that the task-based measure employed was not purely experimental in nature. Indeed, while the DRPT relies on a participant's insight in a different manner than self-report questionnaires, it does not exclusively rely on endorsement like experimental tasks. For example, a recent study investigated the role of inferential confusion in eating disorders by experimentally provoking inferential confusion in different condition settings using video stimuli (Ouellet-Courtois et al., 2021). It was found that inferential confusion could be significantly manipulated in participants with eating disorders. A performance-type measure of inferential confusion, such as the one by Ouellet-Courtois et al. (2021) adapted for OCD, could provide converging evidence from varying methodologies. Regardless, the task-based measure does not solely consist of a one sentence statement or symptom endorsement, but specifically refers to endorsement of reasoning in relation to a short reasoning narratives presented to participants. Hence, although the extent that such a design is experimental can reasonably be questioned, even though previously claimed in the literature as such (Wong & Grisham, 2017b), it cannot be equated with conventional self-report measures either.

The studies in the current thesis also have several strengths. First, all participants from the second thesis article were recruited from the community and not from a university or specialized treatment units. This includes OCD participants displaying high symptom severity despite not being from specialized referrals. The strength of this design is that these participants were not from exceptionally higher (undergraduate samples) or lower functioning groups with OCD (specialized treatment units in a healthcare setting). The head-to-head comparisons between the OCD group and the clinical and non-clinical control groups thus have high ecological validity, which increases the generalizability of findings. In addition, the use of both an analogue sample in the first thesis article and clinical groups in the second thesis article allows for increased generalizability of the findings, as most results from the first thesis article in an undergraduate sample were then replicated in an OCD sample. Furthermore, the use of both task-based and self-report based instruments provided increased convergent validity of the measured constructs. Indeed, findings concerning the DRPT were strengthened by their strong relationships with the ICQ-EV in both thesis articles. Finally, the clinical relevance of the findings is supported by multiple construct associations with OCD symptomatology. In fact, the experimental nature of the second thesis article concerning the administration of psychotherapy allowed for the clinical understanding of the role of inferential confusion in the development and maintenance of OCD, and its role as an important marker for treatment outcome success.

Future Directions

Overall, the findings from this thesis provide support for the notion that inferential confusion plays an important cognitive role in the development and maintenance of OCD, and that it can serve as a significant marker in measuring the success of psychotherapy for those with OCD. Results are consistent with previous findings on the relationship between inferential confusion

with treatment outcome, and the current findings add to a body of research utilizing a different and novel methodology in the measurement of inferential confusion. Other aspects of the current research are more preliminary in nature, highlighting the importance of continued research to further corroborate and expand these results.

In particular, two important findings were that inferential confusion is an important marker in predicting outcome independent of treatment type, and that without a feared self, the effect of inferential confusion on OC symptoms may be attenuated. However, these findings were established in relatively small sample sizes with relatively low power and risk of type of II errors. Consequently, the next logical step would be to evaluate the degree to which improvements in inferential confusion and feared self-perceptions following psychotherapy can both predict and influence treatment outcome in a direct head-to-head comparison between I-CBT and ERP in larger sample sizes. A large randomized clinical trial is currently underway at OCD-RL to investigate these research questions (Aardema, 2022). Recent findings (Aardema et al., 2022) from a multicenter randomized controlled trial comparing the effectiveness of I-CBT to traditional appraisal-based CBT and an adapted mindfulness-based stress reduction (MBSR) intervention have shown that I-CBT can be generalized across symptoms of OCD, that I-CBT is particularly effective amongst OCD participants who demonstrated higher levels of overvalued ideation, and that I-CBT can reach high remission rates within a short amount of time. Future research should also continue investigating the above research questions by including MSBR as an intervention, as it is emerging as a viable, evidence-based and effective cognitive-behavioral treatment for those with OCD (Aardema et al., 2022). As MSBR focuses on increasing one's cognitive flexibility towards the here and now, future research could investigate how inferential confusion may play a

role during key activities of MSBR like meditation, where one is actively attempting to observe thoughts in the present moment.

The sample sizes in this study did not allow for sufficient statistical power to perform fine-grained analyses comparing treatment types (see Appendix E for additional statistical results). In particular, larger sample sizes would allow for a more continuous and dimensional approach with a focus on treatment outcome and the moderating influence of cognitive changes in relevant variables in establishing these outcomes for each respective treatment. In addition, larger sample sizes would allow for the longitudinal and experimental investigation of the role of feared self-perceptions in the working model proposed by Aardema and Wong (2019) in an OCD sample. The current thesis provided support for the working model, but this was limited to the first thesis article, which employed an analogue sample.

Future research should also aim to include large clinical control samples to further establish the significance of inferential confusion as a reasoning characteristic in OCD and determine the varying degree of its presence in other psychopathologies. For example, we propose that patients with OCD spectrum disorders who appear to be most treatment-resistant (Aardema, O'Connor, Delorme et Audet, 2017; Visser et al., 2015), such as those with body dysmorphic disorder (Taillon, O'Connor, Dupuis, & Lavoie, 2013) and hoarding (St-Pierre-Delorme, Lalonde, Perreault, Koszegi, & O'Connor, 2011), be included as transdiagnostic control samples to further investigate the effectiveness of I-CBT relative to ERP. Other psychopathologies that should be included in future research as large transdiagnostic control samples include anxiety, depression, and eating disorders (Aardema, O'Connor, et al., 2005; Blais et al., 2016; Julien et al., 2016; O'Connor et al., 2018; Ouellet-Courtois et al., 2021; Wong et al., 2019). Recent studies have found support for the inclusion of such groups in continued inferential confusion investigations, as

individuals with eating disorders displayed more vulnerability to endorsing higher levels of inferential confusion (Ouellet-Courtois et al., 2021; Wilson, Aardema, & O'Connor, 2018).

Future research employing such samples could also further investigate the relationship between the feared self and inferential confusion in different psychopathologies as compared to OCD participants. Indeed, researchers have recently proposed that the feared self may, like inferential confusion, be a transdiagnostic construct (Aardema et al., 2021). Indeed, those with body dysmorphic disorder and eating disorders have been found to score higher on feared self-perceptions than anxious or depressed controls perhaps due to the highly defining role played by self-perception in these disorders (Aardema, Moulding, et al., 2017; Purcell Lalonde, O'Connor, Aardema, & Coelho, 2015). Such research could also further investigate the working model proposed by Aardema and Wong (2020b) to validate whether inferential confusion always precedes and drives the development of the feared self. In such research, we would expect per the IBA that OCD participants would not tend to score low on inferential confusion, but rather that they would tend to score average to high on inferential confusion (Polman, O'Connor, & Huisman, 2011) while scores on the feared self may vary to a greater degree. Since the feared self is also a construct that would apply to other psychopathologies, we propose that it would be possible for some participants diagnosed with other psychopathologies to score high on the feared self without necessarily demonstrating high levels of inferential confusion. Future research could also employ more fine-grained analyses (i.e. structural equation modeling or multivariate regressions) to investigate the working model proposed by Aardema and Wong (2020b) by taking into account the common variance between the OCD symptom dimensions. The use of larger samples should also allow for the subtype level analysis of the measures used in the present thesis. Finally, future studies should employ the newly validated Feared Self Questionnaire – Extended Version

(Aardema et al., 2021) instead of the FSQ-20. Indeed, this questionnaire has been expanded to tap into all of the feared self domains proposed to be relevant to OCD including a feared corrupted possible self, a feared culpable possible self and a feared malformed possible self.

Future research could also aim to continue improving the measurement of the inferential confusion construct by further investigating, adapting and refining the DRPT. First, the transdiagnostic nature of inferential confusion could be investigated by adapting the DRPT so that it reflects disorder-specific preoccupations and themes. For example, we propose an appropriately powered study employing samples composed of individuals with Generalized Anxiety Disorder (GAD) and OCD comparing effect sizes between inferential confusion in GAD-specific scenarios with scenarios specific to OCD-related concerns and themes. We propose that dysfunctional reasoning for individuals with GAD would not be as further removed from reality as those with OCD who may tend to almost completely disregard their senses. Since GAD is characterized by persistent and excessive worry about the future (American Psychiatric Association, 2013), we propose that the dysfunctional reasoning processes would be less focused on the here and now than what is more typically seen in OCD. The intrusion at the beginning of the sequence would thus be related to an intolerance towards uncertainty and elicit dysfunctional reasoning about what could possibly happen to the person's context in the future. The stimuli on the DRPT would thus be matched to disorder-specific preoccupations for all of the dysfunctional reasoning processes (see Table 1 for several considerations on how the DRPT could be adapted to other psychopathologies). Finally, the DRPT could also be adapted to other languages and cultures by adapting the names of the characters in the scenarios to reflect local customs and adapting the nature of the obsessional doubt to reflect culture-specific concerns.

Table 2

Examples of Clinical Considerations for the Adaptation of the Dysfunctional Reasoning Processes Task (DRPT)

Psychopathology	Nature of dysfunctional reasoning	Examples of disorder-specific DRPT scenarios
Generalized Anxiety Disorder	Less remote than OCD, directed towards future	My friend Jamal has financial difficulties, and nothing is certain, I might have the same problems one day as well (*out-of-context associations).*
Social Anxiety Disorder	Less remote than OCD, directed towards present and future	I might blush when I see him, therefore he might think I am shy. *(inverse reasoning)*
Hypochondria	May be as further removed from reality as OCD, directed towards present and future	I might be experiencing a headache, therefore the headache might indicate that I have a brain cancer. *(inverse reasoning)*
Depression	Difficult to be invested in future, directed towards past and present	I do not remember anyone telling me that I'm a bad friend, but it's possible that I don't remember them telling me that I'm a bad friend. *(active dismissal and distrust of*

		sensory information, self-knowledge and common sense)
Eating disorders	Far removed from reality like OCD, in the here and now	If social media influencers lose weight by not eating, then I could do the same right now. (*out-of-context associations)*
Delusional disorders	Far removed from reality like OCD, directed towards past, present or future	I might not hear my neighbour when I get home, therefore she might be secretly spying on me. *(inverse reasoning)*

Further investigation of the DRPT using factor analysis may provide a more in-depth understanding of the dysfunctional reasoning constructs that give rise to inferential confusion. In fact, it is possible that one reasoning process (i.e. inverse reasoning) may be more important than the others both clinically and statistically by its predictability capabilities. Due to the heterogeneous nature of the disorder and the symptom dimensions being represented in the DRPT, the factor analyses could result in a clustering by symptom dimensions instead of by reasoning processes. Future research can establish whether the three processes can be empirically differentiated from each other, or whether they are indistinguishable and highly-related aspects of inferential confusion that share a strong common element of giving credibility to subjective hypothetical premises and imagined possibilities at the expense of reality during reasoning.

Conclusion

The present body of work has focused on dysfunctional reasoning processes in relation to feared self-perceptions, obsessive-compulsive symptomatology and its treatment. Its findings

support both the role dysfunctional reasoning (i.e. inferential confusion) and feared self-perceptions, both representing promising avenues for further research into cognitive processes underlying psychopathology. Overall, the present thesis highlights the need to further advance our clinical understanding of these markers in successful psychotherapy outcome, as well as the need to further develop and validate cognitive treatments that address them during therapy, especially for those for whom standard treatment options have failed.

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Wong, S. F., & Grisham, J. R. (2017a). Causal role for inverse reasoning on obsessive-compulsive symptoms: Preliminary evidence from a cognitive bias modification for

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Appendices

Appendix A: Ethics Certificates

CERTIFICATION OF ETHICAL ACCEPTABILITY
FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant:	Dr. Shiu Wong
Department:	Faculty of Arts and Science\Psychology
Agency:	N/A
Title of Project:	Thinking and Emotions
Certification Number:	30009560

Valid From: July 12, 2019 To: July 11, 2020

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

Dr. Richard DeMont, Chair, University Human Research Ethics Committee

Centre intégré universitaire de santé et de services sociaux de l'Est-de-l'Île-de-Montréal
Québec

Le 04 novembre 2020

Monsieur Frederick Aardema
CIUSSS de l'Est-de-l'Île-de-Montréal
Installation Institut universitaire en santé mentale de Montréal

Objet : Approbation finale du Comité d'éthique de la recherche

Projet n^{o} 2021-2401

Titre : *Le rôle des processus de raisonnement mésadaptés en relation avec les perceptions de la peur du soi, la symptomatologie du trouble obsessionnel-compulsif et son traitement*

Monsieur Aardema,

Le Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal a évalué, en comité accéléré, les aspects éthiques de votre projet de recherche. Lors de cette évaluation, les documents suivants ont été examinés :

- Déclaration signée (DF - Frederick Aardema 20-08-19_2401.pdf)
- Formulaire d'information et de consentement (DRPT-Consentement-GroupeClinique.docx) [date : 01 septembre 2020]
- Annonce et affiche de recrutement (DRPT-Pub-texte.docx) [date : 01 septembre 2020]
- Formulaire d'information et de consentement (DRPT-Consentement-GroupeNonClinique.docx) [date : 01 septembre 2020]
- Questionnaire (Inventaire d'anxiété de Beck.pdf) [date : 01 septembre 2020]
- Budget (TPRM_Budget-01.09.2020.docx)
- Questionnaire (Inventaire de dépression de Beck (v2).pdf) [date : 01 septembre 2020]
- Engagement (2021_2382-Engagnement du chercheur_2020-07-07.pdf)
- Questionnaire (OBQ-20-FR-client.docx) [date : 01 septembre 2020]
- Questionnaire (Q-Processus Inférentiels-EV.pdf) [date : 01 septembre 2020]
- Questionnaire (VancObsCompInv- Francais.pdf) [date : 01 septembre 2020]
- Questionnaire (FSQ - 65 - checked for grammar and spelling (1).doc) [date : 01 septembre 2020]
- Questionnaire (DRPT-VersionFR-07.02.2019.pdf) [date : 01 septembre 2020]
- Protocole de recherche (DRPT-Protocol-final.docx) [date : 11 août 2020]
- Certificats (Module 3.3_Module 3.3 Certificate of Completion.pdf)
- Certificats (MSSS-LPBaraby-Module1.pdf)
- Certificats (MSSS-LPBaraby-Module3.1.pdf)
- Certificats (MSSS-LPBaraby-Module3.2.pdf)
- Certificats (MSSS-LPBaraby-Module3.3.pdf)
- Cadre de gestion de la banque de données et de matériel biologique (Cadre de gestion des données projet TPRM.docx)
- Cadre de gestion de la banque de données et de matériel biologique (Cadre de gestion-BD TICTACTOC- Version juil2020.docx)

Suite à cette réunion, une approbation conditionnelle vous a été émise en date du 08 octobre 2020. Vous nous avez soumis en date du 09 octobre 2020, les documents suivants :

- Formulaire d'information et de consentement (DRPT-Consentement-GroupeClinique_CORR_CER-8octobre2020modif.docx) [date : 08 octobre 2020, version : 2]
- Formulaire d'information et de consentement (Canevas FIC_Énoncé de consentement en ligne_CEMTL - 2020_05_26-ProjetTPRM.docx) [date : 08 octobre 2020, version : 1]

- Autre document (FSQ - French 65 items - Revised May 1 2020.doc) [date : 08 octobre 2020]

Vos réponses et les modifications apportées à votre projet de recherche ont fait l'objet d'une évaluation. Le tout étant jugé satisfaisant, j'ai le plaisir de vous informer que votre projet de recherche a été approuvé à l'unanimité par le Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal.

De plus, le Comité s'est assuré que le projet a fait l'objet d'un examen scientifique dont le résultat est positif et qui a été effectué par une personne ou un comité ayant l'expertise scientifique nécessaire, si applicable.

Les documents que le Comité a approuvés et que vous pouvez utiliser pour la réalisation de votre projet sont les suivants :

- Protocole de recherche (DRPT-Protocol-final.docx) [date : 11 août 2020]
- Formulaire d'information et de consentement (DRPT-Consentement-GroupeClinique_CORR_CER-8octobre2020modif.docx) [date : 08 octobre 2020, version : 2]
- Formulaire d'information et de consentement (Canevas FIC_Énoncé de consentement en ligne_CEMTL - 2020_05_26-ProjetTPRM.docx) [date : 08 octobre 2020, version : 1]
- Cadre de gestion de la banque de données et de matériel biologique (Cadre de gestion des données projet TPRM.docx)
- Cadre de gestion de la banque de données et de matériel biologique (Cadre de gestion-BD TICTACTOC- Version juil2020.docx)
- Annonce et affiche de recrutement (DRPT-Pub-texte.docx) [date : 01 septembre 2020]
- Questionnaire (Inventaire d'anxiété de Beck.pdf) [date : 01 septembre 2020]
- Budget (TPRM_Budget-01.09.2020.docx)
- Questionnaire (Inventaire de dépression de Beck (v2).pdf) [date : 01 septembre 2020]
- Engagement (2021_2382-Engagnement du chercheur_2020-07-07.pdf)
- Questionnaire (OBQ-20-FR-client.docx) [date : 01 septembre 2020]
- Questionnaire (Q-Processus Inférentiels-EV.pdf) [date : 01 septembre 2020]
- Questionnaire (VancObsCompInv- Francais.pdf) [date : 01 septembre 2020]
- Questionnaire (FSQ - 65 - checked for grammar and spelling (1).doc) [date : 01 septembre 2020]
- Questionnaire (FSQ - French 65 items - Revised May 1 2020.doc) [date : 08 octobre 2020]
- Questionnaire (DRPT-VersionFR-07.02.2019.pdf) [date : 01 septembre 2020]
- Déclaration signée (DF - Frederick Aardema 20-08-19_2401.pdf)
- Certificats (Module 3.3_Module 3.3 Certificate of Completion.pdf)
- Certificats (MSSS-LPBaraby-Module1.pdf)
- Certificats (MSSS-LPBaraby-Module3.1.pdf)
- Certificats (MSSS-LPBaraby-Module3.2.pdf)
- Certificats (MSSS-LPBaraby-Module3.3.pdf)

Cette approbation éthique est valide pour un an à compter de la date de la présente lettre, date de l'approbation finale. Deux mois avant la date d'échéance, vous devrez faire une demande de renouvellement auprès du Comité, en utilisant le document du Comité prévu à cet effet.

Il est à noter qu'aucun membre du comité d'éthique participant à l'évaluation et à l'approbation de ce projet n'est impliqué dans celui-ci.

Dans le cadre du suivi continu, le Comité vous demande de vous conformer aux exigences suivantes en utilisant les formulaires du Comité prévus à cet effet et de soumettre, le cas échéant :

1. toute demande de modification au projet de recherche ou à tout document approuvé par le Comité pour la réalisation de votre projet;
2. tout nouveau renseignement ou toute modification à l'équilibre clinique susceptible d'affecter l'intégrité ou l'éthicité du projet de recherche, d'accroître les risques et les inconvénients pour les participants, de nuire au bon déroulement du projet ou d'avoir une incidence sur le désir d'un participant de continuer à participer au projet;
3. les réactions indésirables qui rencontrent tous les critères suivants :
   a) Cette réaction a eu lieu dans notre établissement ou dans un établissement pour lequel le CÉR a juridiction; b) Il doit s'agir de réaction indésirable ou de réaction indésirable grave ou de réaction indésirable et inattendue; c) Cette réaction doit être reliée ou possiblement, probablement ou certainement reliée au médicament à l'étude ou à une procédure de l'étude.
4. tout accident survenu dans votre site;
5. l'interruption prématurée du projet de recherche, qu'elle soit temporaire ou permanente;
6. tout problème constaté à la suite d'une activité de surveillance ou de vérification menée par un tiers et susceptible de remettre en question l'intégrité ou l'éthicité du projet de recherche;

7. toute suspension ou annulation de l'approbation octroyée par un organisme de subvention ou de réglementation;
8. toute procédure en cours de traitement d'une plainte ou d'une allégation de manquement à l'intégrité ou à l'éthicité ainsi que des résultats de la procédure;
9. toute déviation au projet de recherche susceptible d'augmenter le niveau de risque ou susceptible d'influer sur le bien-être du participant ou d'entacher le consentement du participant;
10. une demande de renouvellement annuel de l'approbation du projet de recherche;
11. le rapport de la fin du projet de recherche.

Nous vous rappelons que la présente décision vaut pour une année et peut être suspendue ou révoquée en cas de non-respect de ces exigences.

Le CÉR achemine votre projet au bureau de la personne formellement mandatée responsable pour obtenir l'autorisation de la réalisation de votre projet au CIUSSS de l'Est-de-l'Île-de-Montréal. Il est entendu que vous ne pouvez commencer la réalisation de votre projet avant d'avoir obtenu cette autorisation.

De plus, nous vous rappelons que vous devez conserver pour une période d'au moins un an suivant la fin du projet, un répertoire distinct comprenant les noms, prénoms, coordonnées, date du début et de fin de la participation de chaque sujet de recherche.

Le Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal est désigné par le ministre de la Santé et des Services sociaux (MSSS) pour les fins d'application de l'article 21 du Code civil du Québec. Il adhère aux directives publiées dans l'Énoncé de politique des trois conseils (ÉPTC 2, 2014), au Plan d'action ministériel en éthique de la recherche et en intégrité scientifique (MSSS 1998) et aux exigences édictées pour les comités d'éthique de la recherche à la Partie C, Titre 5 du Règlement sur les aliments et drogues du Canada (C.R.C. ch.870). Il agit également en conformité avec les standards du *United States Code of Federal Regulations* encadrant la recherche avec des participants humains. Le Comité fonctionne de manière compatible avec les standards internationaux en appliquant, notamment, la Ligne directrice de l'ICH adoptée par Santé Canada : Les bonnes pratiques cliniques.

De plus, nous vous avisons que les règles de fonctionnement du Comité d'éthique de la recherche du CIUSS de l'Est-de-l'Ile-de-Montréal satisfont aux exigences de Santé Canada relatives à l'Attestation du comité d'éthique pour la recherche. La recherche nécessitant un numéro de « US Federal Wide Assurance » est effectuée au CIUSSS de l'Est-de-l'Ile-de-Montréal sous les numéros suivants : FWA00001935 et IRB00002087.

Avec l'expression de nos sentiments les meilleurs.

[redacted]

Kathy Laperrière
Agente administrative
Comité d'éthique de la recherche
CIUSSS de l'Est-de-l'Île-de-Montréal

pour :

Vanessa Chenel, Ph.D.
Conseillère en éthique
Vice-Présidente
Comité d'éthique de la recherche
CIUSSS de l'Est-de-l'Île-de-Montréal

Centre intégré universitaire de santé et de services sociaux de l'Est-de-l'Île-de-Montréal
Québec

Le 10 avril 2018

Monsieur Frederick Aardema
CIUSSS de l'Est-de-l'Île-de-Montréal
Installation Institut universitaire en santé mentale de Montréal

Objet : Approbation finale du Comité d'éthique de la recherche

Projet n^{o} 2018-1463

Titre : *Thérapie cognitive basée sur les inférences versus exposition et prévention de la réponse pour le trouble obsessionnel-compulsif chez l'adulte: essai clinique randomisée de 16 séances*

Monsieur Aardema,

Le Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal a évalué, en comité accéléré, les aspects éthiques de votre projet de recherche. Lors de cette évaluation, les documents suivants ont été examinés :

- Protocole de recherche (PROT_RECH_2018-1463_2018-02-27_FINALE.docx) [date : 27 février 2018, version : 1]
- Cadre de gestion de la banque de données et de matériel biologique (Cadre de gestion-BD TICTACTOC-finale.pdf) [date : 19 août 2014, version : 1]
- Formulaire d'information et de consentement (FIC-2018-1462_CER-CEMTL_V2_FR_2016-11-01 (3).docx) [date : 27 février 2018, version : 1]
- Informations destinées aux participants (infos destinés au participant_FINAL.docx) [date : 01 mars 2018, version : 1]
- Annonce et affiche de recrutement (LETTRE RECRUTEMENT_FINAL.docx) [date : 01 mars 2018, version : 1]
- Annonce et affiche de recrutement (Annonce sur internet.docx) [date : 01 mars 2018, version : 1]
- Annonce et affiche de recrutement (Protocole téléphonique_FINAL.docx) [date : 01 mars 2018, version : 1]
- Questionnaire (BCIS.pdf) [date : 01 janvier 2004]
- Questionnaire (echelleinvaliditesheehan_francais.pdf) [date : 01 janvier 1983]
- Questionnaire (EDQ - Français_correction.docx) [date : 01 janvier 2016]
- Questionnaire (YBOCS-liste o-c.pdf) [date : 01 mars 1995, version : 1]
- Questionnaire (échelle d'idées surévaluées-correction_dec2015.pdf) [date : 01 décembre 2015, version : 1]
- Questionnaire (Test des Guides du Soi.docx) [date : 01 janvier 1999, version : 1]
- Questionnaire (VancObsCompInv- Francais.pdf) [date : 01 août 2003, version : 1]
- Questionnaire (Inventaire d'anxiété de Beck.pdf) [date : 01 janvier 1989, version : 1]
- Questionnaire (Inventaire de dépression de Beck (v2).pdf) [date : 01 janvier 1998, version : 2]
- Questionnaire (Q-Processus Inférentiels-EV.pdf) [date : 01 janvier 2010, version : 2]
- Questionnaire (Échelle des processus dissociatifs-finale.pdf) [date : 01 janvier 1992, version : 1]
- Questionnaire (échelle estime de soi.pdf) [date : 01 janvier 1990, version : 1]
- Questionnaire (Echelle de conscience des cognitions obsessionnelles.pdf) [date : 01 janvier 2008, version : 1]
- Questionnaire (FSQ - French 53 Item_2017-04-12.doc) [date : 12 avril 2017, version : 1]
- Questionnaire (DES-II-version canadien-francais.pdf) [date : 01 janvier 1999, version : 1]
- Questionnaire (Questionnaire sur la confiance en soi-finale.docx) [date : 01 janvier 1997, version : 1]
- Questionnaire (Mesure d'ambivalence de soi.pdf) [date : 01 janvier 2007, version : 1]
- Questionnaire (Échelle dévaluation du thérapeute_modifié.pdf) [date : 01 janvier 1995, version : 1]
- Questionnaire (questionnaire sociodemographique_FR.doc) [date : 05 mars 2018, version : 1]
- Certificats (o'connor_cerificat_formation_modules1-3.pdf)
- Certificats (Aardema Ethics Certificate Level 1 and 3.pdf)
- Déclaration financière (2018-1463_déclaration_financière_signée.pdf)
- Certificats (ouellet-courtios_module 1[1].pdf)
- Certificats (ouellet-courtois_module 3.1[1].pdf)

- Certificats (ouellet-courtois_module 3.2[1].pdf)
- Certificats (ouellet-courtois_module 3.3[1].pdf)
- Certificats (certificat_de_formation_pour_le_module_1_ÉTHIQUE_KARINE.pdf)
- Certificats (certificat_de_formation_pour_le_module_3.1_ÉTHIQUE_KARINE.pdf)
- Certificats (certificat_de_formation_pour_le_module_3.2_ÉTHIQUE_KARINE.pdf)
- Certificats (certificat_de_formation_pour_le_module_3.3_ÉTHIQUE_KARINE.pdf)
- Rapport d'évaluation CES (Comité_scientifique_2018-01-23.pdf)
- Document financier (AVIS_DECISION_389466.pdf) [date : 22 janvier 2018, version : 1]
- Engagement (engagement_chercheur_signé.pdf)
- Lettre d'autorisation du directeur des services professionnels (2018-1463_autorisation_DSP_consultation_dossier.pdf) [date : 23 mars 2018]

Suite à cette réunion, une approbation conditionnelle vous a été émise en date du 27 mars 2018. Vous nous avez soumis en date du 28 mars 2018, les documents suivants :

- Formulaire d'information et de consentement (FIC-2018-1462_CER-CEMTL_V2_FR_2018-03-28_CETOCT.docx) [date : 28 mars 2018, version : 2]

Vos réponses et les modifications apportées à votre projet de recherche ont fait l'objet d'une évaluation. Le tout étant jugé satisfaisant, j'ai le plaisir de vous informer que votre projet de recherche a été approuvé à l'unanimité par le Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal.

Les documents que le Comité a approuvés et que vous pouvez utiliser pour la réalisation de votre projet sont les suivants :

- Protocole de recherche (PROT_RECH_2018-1463_2018-02-27_FINALE.docx) [date : 27 février 2018, version : 1]
- Cadre de gestion de la banque de données et de matériel biologique (Cadre de gestion-BD TICTACTOC-finale.pdf) [date : 19 août 2014, version : 1]
- Formulaire d'information et de consentement (FIC-2018-1462_CER-CEMTL_V2_FR_2018-03-28_CETOCT.docx) [date : 28 mars 2018, version : 2]
- Informations destinées aux participants (infos destinés au participant_FINAL.docx) [date : 01 mars 2018, version : 1]
- Annonce et affiche de recrutement (LETTRE RECRUTEMENT_FINAL.docx) [date : 01 mars 2018, version : 1]
- Annonce et affiche de recrutement (Annonce sur internet.docx) [date : 01 mars 2018, version : 1]
- Annonce et affiche de recrutement (Protocole téléphonique_FINAL.docx) [date : 01 mars 2018, version : 1]
- Questionnaire (BCIS.pdf) [date : 01 janvier 2004]
- Questionnaire (echelleinvaliditesheehan_francais.pdf) [date : 01 janvier 1983]
- Questionnaire (EDQ - Français_correction.docx) [date : 01 janvier 2016]
- Questionnaire (YBOCS-liste o-c.pdf) [date : 01 mars 1995, version : 1]
- Questionnaire (échelle d'idées surévaluées-correction_dec2015.pdf) [date : 01 décembre 2015, version : 1]
- Questionnaire (Test des Guides du Soi.docx) [date : 01 janvier 1999, version : 1]
- Questionnaire (VancObsCompInv- Francais.pdf) [date : 01 août 2003, version : 1]
- Questionnaire (Inventaire d'anxiété de Beck.pdf) [date : 01 janvier 1989, version : 1]
- Questionnaire (Inventaire de dépression de Beck (v2).pdf) [date : 01 janvier 1998, version : 2]
- Questionnaire (Q-Processus Inférentiels-EV.pdf) [date : 01 janvier 2010, version : 2]
- Questionnaire (Échelle des processus dissociatifs-finale.pdf) [date : 01 janvier 1992, version : 1]
- Questionnaire (échelle estime de soi.pdf) [date : 01 janvier 1990, version : 1]
- Questionnaire (Echelle de conscience des cognitions obsessionnelles.pdf) [date : 01 janvier 2008, version : 1]
- Questionnaire (FSQ - French 53 Item_2017-04-12.doc) [date : 12 avril 2017, version : 1]
- Questionnaire (DES-II-version canadien-francais.pdf) [date : 01 janvier 1999, version : 1]
- Questionnaire (Questionnaire sur la confiance en soi-finale.docx) [date : 01 janvier 1997, version : 1]
- Questionnaire (Mesure d'ambivalence de soi.pdf) [date : 01 janvier 2007, version : 1]
- Questionnaire (Échelle dévaluation du thérapeute_modifié.pdf) [date : 01 janvier 1995, version : 1]
- Questionnaire (questionnaire sociodemographique_FR.doc) [date : 05 mars 2018, version : 1]

Cette approbation éthique est valide pour un an à compter de la date de la présente lettre, date de l'approbation finale. Deux mois avant la date d'échéance, vous devrez faire une demande de renouvellement auprès du Comité, en utilisant le document du Comité prévu à cet effet.

Dans le cadre du suivi continu, le Comité vous demande de vous conformer aux exigences suivantes en utilisant les formulaires du

Comité prévus à cet effet et de soumettre, le cas échéant :

1. toute demande de modification au projet de recherche ou à tout document approuvé par le Comité pour la réalisation de votre projet;
2. tout nouveau renseignement ou toute modification à l'équilibre clinique susceptible d'affecter l'intégrité ou l'éthicité du projet de recherche, d'accroître les risques et les inconvénients pour les participants, de nuire au bon déroulement du projet ou d'avoir une incidence sur le désir d'un participant de continuer à participer au projet;
3. les réactions indésirables qui rencontrent tous les critères suivants :
   a) Cette réaction a eu lieu dans notre établissement ou dans un établissement pour lequel le CÉR a juridiction; b) Il doit s'agir de réaction indésirable ou de réaction indésirable grave ou de réaction indésirable et inattendue; c) Cette réaction doit être reliée ou possiblement, probablement ou certainement reliée au médicament à l'étude ou à une procédure de l'étude.
4. tout accident survenu dans votre site;
5. l'interruption prématurée du projet de recherche, qu'elle soit temporaire ou permanente;
6. tout problème constaté à la suite d'une activité de surveillance ou de vérification menée par un tiers et susceptible de remettre en question l'intégrité ou l'éthicité du projet de recherche;
7. toute suspension ou annulation de l'approbation octroyée par un organisme de subvention ou de réglementation;
8. toute procédure en cours de traitement d'une plainte ou d'une allégation de manquement à l'intégrité ou à l'éthicité ainsi que des résultats de la procédure;
9. toute déviation au projet de recherche susceptible d'augmenter le niveau de risque ou susceptible d'influer sur le bien-être du participant ou d'entacher le consentement du participant;
10. une demande de renouvellement annuel de l'approbation du projet de recherche;
11. le rapport de la fin du projet de recherche.

Nous vous rappelons que la présente décision vaut pour une année et peut être suspendue ou révoquée en cas de non-respect de ces exigences.

Le CÉR achemine votre projet au bureau de la personne formellement mandatée responsable pour obtenir l'autorisation de la réalisation de votre projet au CIUSSS de l'Est-de-l'Île-de-Montréal. Il est entendu que vous ne pouvez commencer la réalisation de votre projet avant d'avoir obtenu cette autorisation.

De plus, nous vous rappelons que vous devez conserver pour une période d'au moins un an suivant la fin du projet, un répertoire distinct comprenant les noms, prénoms, coordonnées, date du début et de fin de la participation de chaque sujet de recherche.

Le Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal est désigné par le ministre de la Santé et des Services sociaux (MSSS) pour les fins d'application de l'article 21 du Code civil du Québec. Il adhère aux directives publiées dans l'Énoncé de politique des trois conseils (ÉPTC 2, 2014), au Plan d'action ministériel en éthique de la recherche et en intégrité scientifique (MSSS 1998) et aux exigences édictées pour les comités d'éthique de la recherche à la Partie C, Titre 5 du Règlement sur les aliments et drogues du Canada (C.R.C. ch.870). Il agit également en conformité avec les standards du *United States Code of Federal Regulations* encadrant la recherche avec des participants humains. Le Comité fonctionne de manière compatible avec les standards internationaux en appliquant, notamment, la Ligne directrice de l'ICH adoptée par Santé Canada : Les bonnes pratiques cliniques.

De plus, nous vous avisons que les règles de fonctionnement du Comité d'éthique de la recherche du CIUSS de l'Est-de-l'Île-de-Montréal satisfont aux exigences de Santé Canada relatives à l'Attestation du comité d'éthique pour la recherche. La recherche nécessitant un numéro de « US Federal Wide Assurance » est effectuée au CIUSSS de l'Est-de-l'Île-de-Montréal sous les numéros suivants : FWA00001935 et IRB00002087.

Avec l'expression de nos sentiments les meilleurs.

[redacted]

Stéphane P. Ahern, M.A., M.D., Ph.D.
Président
Comité d'éthique de la recherche
CIUSSS de l'Est-de-l'Île-de-Montréal

Appendix B: Consent Forms

Consent Form for OCD participants who were recruited from Project 2018-1463 at OCD-RL

Centre intégré universitaire de santé et de services sociaux de l'Est-de-l'Île-de-Montréal
Québec

FORMULAIRE D'INFORMATION ET DE CONSENTEMENT

Titre du projet de recherche :	Thérapie cognitive basée sur les inférences versus exposition et prévention de la réponse pour le trouble obsessionnel-compulsif chez l'adulte: essai clinique randomisé de 16 séances
Chercheur responsable du projet de recherche :	Frederick Aardema, Centre de recherche de l'Institut universitaire en santé mentale de Montréal
Co-chercheur(s)/site(s) :	Adam Radomsky, chercheur et professeur à l'Université de Concordia
Membre du personnel de recherche :	Lysandre Bourguignon, coordonnatrice de recherche Jean-Sébastien Audet, assistant de recherche Louis-Philippe Baraby, assistant de recherche
Organisme subventionnaire :	Les Instituts de recherche en santé du Canada (IRSC)
Installation(s) ou site(s) :	Centre de recherche de l'Institut universitaire en santé mentale de Montréal

INTRODUCTION

Nous vous invitons à participer à un projet de recherche. Cependant, avant d'accepter de participer à ce projet et de signer ce formulaire d'information et de consentement, veuillez prendre le temps de lire, de comprendre et de considérer attentivement les renseignements qui suivent.

Ce formulaire peut contenir des mots que vous ne comprenez pas. Nous vous invitons à poser toutes les questions que vous jugerez utiles au chercheur responsable de ce projet ou à un membre de son personnel de recherche et à leur demander de vous expliquer tout mot ou renseignement qui n'est pas clair.

NATURE ET OBJECTIFS DU PROJET DE RECHERCHE

Le but de ce projet est de mesurer et de comparer les effets d'une thérapie cognitive, la thérapie cognitive basée sur les inférences (TCBI), avec les effets de la thérapie d'exposition et de prévention de la réponse (ERP) dans le traitement du trouble obsessionnel-compulsif (TOC).

Pour la réalisation de ce projet de recherche, nous comptons recruter 172 participants, hommes et femmes, âgés de 18 ans et plus.

DÉROULEMENT DU PROJET DE RECHERCHE

Ce projet de recherche se déroulera au Centre de recherche de l'Institut universitaire en santé mentale de Montréal.

1. Durée et nombre de visites

Votre participation à ce projet de recherche durera 11 mois et comprendra 22 visites. Les visites seront d'une durée variant de 60 à 340 minutes (1h à 5h30). Tout d'abord, le projet inclut 4 rencontres avec un(e) évaluateur(rice). Ces rencontres se détaillent comme suit : une première rencontre pour évaluer votre profil psychologique et par la suite, 3 rencontres pour évaluer les effets du traitement sur les symptômes du TOC et autres symptômes.
La rencontre 1, pour l'évaluation de votre profil psychologique sera d'une durée de 300 minutes maximum (5h00) et les rencontres 2 à 4 seront d'une durée maximum de 160 minutes (2h30). Enfin, il y aura 18 séances avec un(e)

psychologue : 2 séances de 90 minutes et 16 séances de 60 minutes.

2. Nature de votre participation

Votre participation à ce projet de recherche se divise en 3 phases :

1. Phase d'évaluation-diagnostic et clinique
2. Phase de traitement psychologique
3. Phase d'évaluation des effets du traitement

1. Évaluation-diagnostique et clinique

La PREMIÈRE PHASE est l'évaluation diagnostique et clinique de votre état psychologique. Pour ce faire, vous devrez rencontrer un(e) évaluateur(rice) pour prendre part à une entrevue structurée qui évaluera l'absence ou la présence de troubles mentaux et/ou de la personnalité. De plus, lors de cette rencontre, l'évaluateur vous posera des questions sur vos symptômes obsessionnels et compulsifs et sur vos croyances en lien avec votre TOC. Cette rencontre aura lieu au Centre de recherche de l'Institut universitaire en santé mentale de Montréal (CRIUSMM) et sera d'une durée de 5h00 maximum. De plus, les rencontres d'évaluation seront audio enregistrées afin de s'assurer que la modalité thérapeutique ou le nom du thérapeute ne soit pas dévoilé pendant l'évaluation. Ces enregistrements serviront également à assurer l'intégrité de l'évaluation. Une partie des enregistrements sera écoutée par un membre de l'équipe de recherche. Les enregistrements seront identifiés par le numéro de code attribué à chaque participant.

Suite à cette évaluation, votre dossier sera examiné, selon les critères d'inclusion et d'exclusion du projet de recherche, par la coordonnatrice clinique. Elle déterminera si vous êtes admissible pour la phase de traitement. Si vous n'êtes pas admissible, vous serez redirigé vers une ressource répondant à vos besoins. Si vous êtes admis(e), votre dossier sera distribué au hasard, entre les deux thérapies pour traiter le TOC.

2. Traitement psychologique

La DEUXIÈME PHASE comprend les séances de traitement psychologique individuel. Les participant(e)s admis(e)s dans cette phase devront assister à 18 séances de thérapie pour traiter le TOC, avec un(e) psychologue. De plus, au cours de ces rencontres, vous aurez à remplir des questionnaires à la maison qui mesurent des caractéristiques que l'on peut retrouver chez les personnes avec un TOC. L'audio des rencontres avec les psychologues seront enregistrées afin d'établir l'intégrité du traitement. Une partie des enregistrements sera écoutée par un membre de l'équipe de recherche. Les enregistrements seront identifiés par le numéro de code attribué à chaque participant.

Rencontre de thérapie. THÉRAPIE COGNITIVE BASÉE SUR LES INFÉRENCES

Ce traitement fut développé afin d'aider les personnes à cibler le raisonnement dysfonctionnel qui produit le doute obsessionnel et les idées surévaluées. Ce traitement n'utilise pas l'exposition mais vise la résolution du doute de base. Le ou la psychologue amènera le participant à constater que l'obsession est causée par une erreur de raisonnement. Ainsi, à travers 10 étapes, le participant aura des exercices à faire afin d'identifier ses doutes, de réaliser que ceux-ci ne sont pas plausibles dans les moments où ils surviennent, que le raisonnement derrière ce doute est subjectif et qu'il va à l'encontre de ses sens et de ce qu'il perçoit. Par la suite, le thérapeute guidera la personne dans la création d'une histoire de son TOC pour l'aider à identifier les types de raisonnement qui sous-tendent cette histoire. Aussi, le participant sera amené à identifier lorsqu'il quitte le monde réel (celui-ci basée sur les sens) pour un monde imaginaire (où il ne se fie plus à ses sens). Le participant est emmené à voir que dans certaines sphères de sa vie, il est capable de faire confiance à ses sens et donc qu'il peut généraliser cette capacité dans les domaines où le TOC à emprise.

Rencontre de thérapie. THÉRAPIE D'EXPOSITION ET DE PRÉVENTION DE LA RÉPONSE

Ce traitement fut développé afin d'aider les personnes à confronter leurs peurs en les exposant à ce qui les effraie. Ainsi, le but de ce traitement est de réduire la peur et diminuer les comportements d'évitement. Pendant le traitement, vous devrez vous exposer à ce qui vous fait peur pendant et entre les séances de thérapie selon une hiérarchie que vous aurez travaillée avec le ou la psychologue. De plus, le participant apprendra à ne pas faire ses comportements compulsifs afin de réduire l'anxiété. Ainsi, les exercices consisteront à faire de l'exposition dans des situations réelles ou imaginées, en partant du bas de la hiérarchie (moins d'anxiété) jusqu'en haut de la hiérarchie (plus d'anxiété). Il y aura des exercices et des devoirs quotidiens à faire tout au long du traitement. À la fin des séances, il y aura des rencontres pour renforcer les apprentissages et encourager le maintien des gains acquis en thérapie.

3. Phase d'évaluation des effets du traitement

La TROISIÈME PHASE est l'évaluation des effets du traitement. Afin de les mesurer et de les comparer, vous devrez venir rencontrer un(e) évaluateur(rice) à 3 moments pendant et après les rencontres de traitement. La 1re rencontre d'évaluation se fera à la moitié des séances de thérapie, soit entre la séance 10 et 11. La 2e rencontre d'évaluation se fera à la fin des séances de thérapie, soit tout de suite après la séance 18. La 3e rencontre d'évaluation se fera 6 mois après la séance 18. Toutes ces rencontres se feront en personne à l'Institut universitaire en santé mentale de Montréal, avec l'évaluateur(rice) et durera 160 minutes/2h30 maximum.

3.1. Questionnaires

Trois types de questionnaires vous seront remis tout au long de votre participation au projet de recherche :

1- Questionnaires sur les symptômes et les processus relatifs au TOC : ces questionnaires vous seront remis à 5 moments différents et cela vous prendra, pour chaque moment, 90 minutes à remplir et vous aurez 7 jours pour le faire.
2- Questionnaires sur les caractéristiques de la thérapie : ces questionnaires vous seront remis à 3 moments différents et cela vous prendra, pour chaque moment, 90 minutes à remplir et vous aurez 7 jours pour le faire.
3- Questionnaires sur le fonctionnement psychosocial : ces questionnaires vous seront remis à 5 moments différents et cela vous prendra, pour chaque moment, 90 minutes à remplir et vous aurez 7 jours pour le faire.

AVANTAGES ASSOCIÉS AU PROJET DE RECHERCHE

Il se peut que vous retiriez un bénéfice personnel de votre participation à ce projet de recherche, mais nous ne pouvons vous l'assurer. Par ailleurs, nous espérons que les résultats obtenus contribueront à l'avancement des connaissances scientifiques dans ce domaine et au développement de meilleurs traitements pour les patients.

RISQUES ET INCONVÉNIENTS ASSOCIÉS AU PROJET DE RECHERCHE

Outre le temps consacré à la participation à ce projet de recherche et le déplacement, vous pourriez également ressentir de la gêne, de l'anxiété, de la honte ou de la frustration. Mais ces émotions sont normales dans le cadre d'une évaluation et/ou lors d'une psychothérapie.

PARTICIPATION VOLONTAIRE ET DROIT DE RETRAIT

Votre participation à ce projet de recherche est volontaire. Vous êtes donc libre de refuser d'y participer. Vous pouvez également vous retirer de ce projet à n'importe quel moment, sans avoir à donner de raisons, en informant l'équipe de recherche.

Votre décision de ne pas participer à ce projet de recherche ou de vous en retirer n'aura aucune conséquence sur la qualité des soins et des services auxquels vous avez droit ou sur votre relation avec les équipes qui les dispensent.

Le chercheur responsable de ce projet de recherche, le Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal, l'organisme subventionnaire ou le commanditaire peuvent mettre fin à votre participation, sans votre consentement. Cela peut se produire si de nouvelles découvertes ou informations indiquent que votre participation au projet n'est plus dans votre intérêt, si vous ne respectez pas les consignes du projet de recherche ou encore s'il existe des raisons administratives d'abandonner le projet.

Cependant, avant de vous retirer de ce projet de recherche, nous vous suggérons à des fins de sécurité de revenir une dernière fois pour une évaluation finale.

Si vous vous retirez du projet ou êtes retiré du projet, l'information et le matériel déjà recueillis dans le cadre de ce projet seront néanmoins conservés, analysés ou utilisés pour assurer l'intégrité du projet.

Toute nouvelle connaissance acquise durant le déroulement du projet qui pourrait avoir un impact sur votre décision de continuer à participer à ce projet vous sera communiquée rapidement.

CONFIDENTIALITÉ

Durant votre participation à ce projet de recherche, le chercheur responsable de ce projet ainsi que les membres de son personnel de recherche recueilleront, dans un dossier de recherche, les renseignements vous concernant et nécessaires pour répondre aux objectifs scientifiques de ce projet de recherche.

Ces renseignements peuvent comprendre les informations contenues dans votre dossier médical concernant vos diagnostics de trouble mental passés et présents. Votre dossier va aussi comprendre d'autres renseignements tels que vos noms, votre sexe, votre date de naissance, votre adresse postale et votre adresse de courriel, votre origine ethnique, votre dernier diplôme obtenu, une estimation de votre revenu annuel brut et votre langue maternelle.

Tous les renseignements recueillis demeureront confidentiels dans les limites prévues par la loi. Tous les documents que vous remplirez seront identifiés par un numéro de code. La clé du code reliant votre nom à votre dossier de recherche sera conservée par le chercheur responsable de ce projet de recherche.

Les données de recherche codées pourront être transmises par le chercheur responsable du projet à Louis-Philippe Baraby et Jean-Sébastien Audet, assistants de recherche et étudiants au doctorat à l'Université de Montréal; Lysandre Bourguignon, coordonnatrice, Natalia Koszegi, coordonnatrice clinique, Adam Radomsky,chercheur collaborateur et superviseur de l'intégrité des traitements et de l'adhérence au traitement et Kelvin Wong,étudiant postdoctoral en psychologie à l'Université Concordia. Cependant, le chercheur responsable et les personnes à qui il transmettra les données de recherche sont tenus de respecter les règles de confidentialité en vigueur au Québec et au Canada, et ce, quels que soient les pays.

Ces données de recherche seront conservées pendant au moins 25 ans par le chercheur responsable de ce projet de recherche.

Les données de recherche pourront être publiées ou faire l'objet de discussions scientifiques, mais il ne sera pas possible de vous identifier.

À des fins de surveillance, de contrôle, de protection, de sécurité, votre dossier de recherche ainsi que vos dossiers médicaux pourront être consultés par une personne mandatée par des organismes réglementaires, au Canada ou à l'étranger, tel que Santé Canada, ainsi que par des représentants de l'organisme subventionnaire, de l'établissement ou du Comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal. Ces personnes et ces organismes adhèrent à une politique de confidentialité.

Vous avez le droit de consulter votre dossier de recherche pour vérifier les renseignements recueillis et les faire rectifier au besoin. Par ailleurs, l'accès à certaines informations avant la fin de l'étude pourrait impliquer que vous soyez retiré du projet afin d'en préserver l'intégrité.

POSSIBILITÉ DE COMMERCIALISATION

Les résultats de la recherche découlant notamment de votre participation pourraient mener à la création de produits commerciaux. Cependant, vous ne pourrez en retirer aucun avantage financier.

FINANCEMENT DU PROJET DE RECHERCHE

Le chercheur responsable de ce projet de recherche a reçu un financement des Instituts de recherche en santé du Canada (IRSC) pour mener à bien ce projet de recherche.

COMPENSATION

Vous ne recevrez pas de compensation financière pour votre participation à ce projet de recherche.

EN CAS DE PRÉJUDICE

Si vous deviez subir quelque préjudice que ce soit par suite de toute procédure reliée à ce projet de recherche, vous recevrez tous les soins et services requis par votre état de santé.

En acceptant de participer à ce projet de recherche, vous ne renoncez à aucun de vos droits et vous ne libérez pas le chercheur responsable de ce projet de recherche et l'établissement de leur responsabilité civile et professionnelle.

IDENTIFICATION DES PERSONNSES-RESSOURCES

Si vous avez des questions ou éprouvez des problèmes en lien avec le projet de recherche, ou si vous souhaitez vous en retirer, vous pouvez communiquer avec le chercheur responsable de ce projet de recherche ou avec une personne de l'équipe de recherche au numéro suivant : Lysandre Bourguignon, coordonnatrice, 514.251.4015.3585

En cas d'urgence, veuillez contacter Lysandre Bourguignon, au numéro suivant : 514.251.4015.3585 ou vous rendre aux urgences de l'hôpital le plus proche.

Pour toute question concernant vos droits en tant que participant à ce projet de recherche ou si vous avez des plaintes ou des commentaires à formuler, vous pouvez communiquer avec le Commissaire aux plaintes et à la qualité des services du CIUSSS de l'Est-de-l'Île-de-Montréal au 514-252-3400, poste 3510.

SURVEILLANCE DES ASPECTS ÉTHIQUES DU PROJET DE RECHERCHE

Le comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal a approuvé le projet et en assurera le suivi. Pour toute information, vous pouvez communiquer avec le secrétariat du Comité au 514-252-3400, poste 5708.

Titre du projet de recherche : Thérapie cognitive basée sur les inférences versus exposition et prévention de la réponse pour le trouble obsessionnel-compulsif chez l'adulte: essai clinique randomisé de 16 séances

SIGNATURES

Signature du participant

J'ai pris connaissance du formulaire d'information et de consentement. On m'a expliqué le projet de recherche et le présent formulaire d'information et de consentement. On a répondu à mes questions et on m'a laissé le temps voulu pour prendre une décision. Après réflexion, je consens à participer à ce projet de recherche aux conditions qui y sont énoncées.

J'autorise l'équipe de recherche à avoir accès à mon dossier médical.

J'autorise le chercheur responsable de la présente recherche à communiquer avec moi afin de me demander si je suis intéressé(e) à participer à d'autres projets de recherches.

Oui ☐ Non ☐

J'autorise le chercheur responsable de la présente recherche d'informer mon médecin habituel que je prends part à ce projet de recherche

Oui ☐ Non ☐

Nom et coordonnées du médecin traitant

Nom et signature du participant | Signature | Date

Signature de la personne qui obtient le consentement

J'ai expliqué au participant le projet de recherche et le présent formulaire d'information et de consentement et j'ai répondu aux questions qu'il m'a posées.

Nom et signature de la personne qui obtient le consentement | Signature | Date

Healthy Control Group Consent Form: presented directly online within the Checkbox platform.

FORMULAIRE D'INFORMATION ET DE CONSENTEMENT

Titre du projet de recherche :	Le rôle des processus de raisonnement mésadaptés en relation avec les perceptions envers le soi redouté, la symptomatologie du trouble obsessionnel-compulsif et son traitement
Site :	Centre de recherche de l'Institut universitaire en santé mentale de Montréal (CRIUSMM)
Chercheur responsable du projet :	Frederick Aardema, Centre de recherche de l'Institut universitaire en santé mentale de Montréal (CRIUSMM)
Doctorant responsable du projet :	Louis-Philippe Baraby, Département de psychologie, Université de Montréal
Membre du personnel de recherche :	Lysandre Bourguignon, coordonnatrice de recherche, CRIUSMM

INTRODUCTION

Merci de votre intérêt pour notre étude. Votre participation à ce projet nous permettra d'évaluer les effets du raisonnement sur les symptômes du trouble obsessionnel-compulsif. Avant d'accepter de participer à cette étude, veuillez prendre le temps de lire, de comprendre et de considérer l'information qui suit.

DÉROULEMENT DU PROJET DE RECHERCHE

Nature et objectifs

Le but de ce projet est de mieux comprendre de quelle manière les processus de raisonnement sont liés aux symptômes du trouble obsessionnel-compulsif et à la santé mentale.

Pour la réalisation de ce projet de recherche, nous comptons recruter 30 participants (hommes, femmes et toute personne issue de la diversité sexuelle et de genre LGBTQIA2+) âgés de 18 ans et plus.

Nous vous invitons à poser toutes les questions que vous jugerez utiles à l'équipe de recherche avant de prendre part à ce projet.

Durée et implication

Votre participation à ce projet de recherche comprendra la complétion d'un sondage en ligne de 7 courts questionnaires. Ce sondage devrait vous prendre environ 60 minutes à compléter.

RISQUES, INCONVÉNIENTS ET AVANTAGES ASSOCIÉS AU PROJET DE RECHERCHE

Outre le temps consacré à la participation à ce projet de recherche, il existe un risque que vous ressentiez une légère fatigue et que vous ressentiez certaines émotions négatives comme de l'anxiété ou de la gêne pendant ou après avoir complété l'évaluation psychologique et rempli les questionnaires en ligne. Ces émotions sont normales dans le cadre d'une évaluation. Vous ne retirerez pas de bénéfices de votre participation à ce projet de recherche. Nous espérons que les résultats obtenus contribueront à l'avancement des connaissances scientifiques dans le domaine du trouble obsessionnel-compulsif. Vous ne recevrez pas de compensation financière pour votre participation à ce projet de recherche, mais si vous complétez tous les questionnaires, vous pourrez inscrire votre adresse courriel pour courir la chance de remporter une carte-cadeau de 50 $ chez Amazon (le tirage pour cette carte-cadeau sera effectué une fois que les 30 participants auront complétés leur participation). Votre adresse courriel sera gardée dans une base de données sécurisée et indépendante de vos réponses.

PARTICIPATION VOLONTAIRE ET DROIT DE RETRAIT

Votre participation à ce projet de recherche est volontaire et anonyme. Vous êtes donc libre de refuser d'y participer. Vous pouvez également cesser de répondre au questionnaire en ligne à tout moment. Comme le présent questionnaire ne donne aucun moyen à l'équipe de recherche de vous identifier, il ne sera pas possible de demander aux chercheurs d'exclure vos données après avoir rempli et soumis le questionnaire.

CONFIDENTIALITÉ

Tous les renseignements recueillis dans le cadre de ce projet de recherche demeureront confidentiels dans les limites prévues par la loi. Dans le bloc de questionnaires en ligne, les chercheurs ne recueilleront aucune information permettant de vous identifier et vos données seront anonymes. Les données de recherche seront conservées pour une durée minimale de 7 ans par le chercheur responsable de ce projet de recherche. Les données pourront être publiées ou faire l'objet de discussions scientifiques, mais il ne sera jamais possible de vous identifier.

IDENTIFICATION DES PERSONNES-RESSOURCES

Si vous avez des questions ou éprouvez des problèmes en lien avec le projet de recherche, vous pouvez communiquer avec Louis-Philippe Baraby, le doctorant en psychologie responsable de cette étude par téléphone: [redacted] ou par courriel : xxxxxxxxx@xxxxxx.xxx.

Une liste de ressources sera aussi mise à votre disposition à la fin du questionnaire si vous ressentez le besoin de parler de votre expérience. Pour toute question concernant vos droits en tant que participant à ce projet de recherche ou si vous avez des plaintes ou des commentaires à formuler, vous pouvez communiquer avec le Commissaire aux plaintes et à la qualité des services du CIUSSS de l'Est-de-l'Île-de-Montréal au 514-252-3400, poste 3510. Le comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal a approuvé le projet et en assurera le suivi.

CONSENTEMENT

J'ai pris connaissance du formulaire d'information et de consentement et je comprends la nature du projet de recherche. On a répondu à mes questions, si j'en avais, et on m'a laissé le temps voulu pour décider de participer. Après réflexion, je consens à participer à ce projet de recherche et aux conditions qui y sont énoncées.

_____

Nom du participant

_____

Numéro de téléphone du participant

_____

Adresse courriel du participant (pour la compensation financière par virement Interac)

_____

Signature Date

Clinical Control Group Consent Form

CENTRE DE RECHERCHE DE L'IUSMM
CENTRE AFFILIÉ À L'UNIVERSITÉ DE MONTRÉAL

Université de Montréal

FORMULAIRE D'INFORMATION ET DE CONSENTEMENT

Titre du projet de recherche :	Le rôle des processus de raisonnement mésadaptés en relation avec les perceptions envers le soi redouté, la symptomatologie du trouble obsessionnel-compulsif et son traitement
Site :	Centre de recherche de l'Institut universitaire en santé mentale de Montréal (CR-IUSMM)
Chercheur responsable du projet :	Frederick Aardema, Centre de recherche de l'Institut universitaire en santé mentale de Montréal (CR-IUSMM)
Doctorant responsable du projet :	Louis-Philippe Baraby, Département de psychologie, Université de Montréal
Membre du personnel de recherche :	Lysandre Bourguignon, coordonnatrice de recherche (CR-IUSMM)

INTRODUCTION

Merci de votre intérêt pour notre étude. Votre participation à ce projet nous permettra d'évaluer les effets du raisonnement sur les symptômes du trouble obsessionnel-compulsif. Avant d'accepter de participer à cette étude, veuillez prendre le temps de lire, de comprendre et de considérer l'information qui suit.

DÉROULEMENT DU PROJET DE RECHERCHE

Nature et objectifs

Le but de ce projet est de mieux comprendre de quelle manière les processus de raisonnement sont liés aux symptômes du trouble obsessionnel-compulsif et à la santé mentale.

Pour la réalisation de ce projet de recherche, nous comptons recruter 30 participants (hommes, femmes et toute personne issue de la diversité sexuelle et de genre LGBTQIA2+) âgés de 18 ans et plus.

Nous vous invitons à poser toutes les questions que vous jugerez utiles à l'équipe de recherche avant de prendre part à ce projet.

Durée et implication

Votre participation à ce projet de recherche comprendra deux étapes : (1) d'abord une rencontre durant jusqu'à 60 minutes avec un évaluateur afin d'évaluer votre profil psychologique, (2) puis votre participation impliquera la complétion d'un sondage en ligne de 7 courts questionnaires. Ce sondage devrait vous prendre environ 60 minutes à compléter.

La rencontre avec l'évaluateur sera une entrevue clinique structurée lui permettant d'évaluer l'absence ou la présence de troubles mentaux. Cette rencontre aura lieu à l'aide du logiciel Zoom Santé et sera d'une durée de 60 minutes maximum. L'évaluation ne sera pas enregistrée. Une fois terminée, l'évaluateur vous enverra par courriel un mot de passe, un code d'identification unique ainsi qu'un lien pour remplir le bloc de questionnaires en ligne. Une fois les questionnaires en ligne complétés, l'évaluateur vous fournira la compensation financière prévue de 50 $ (celle-ci vous sera envoyée par virement Interac).

RISQUES, INCONVÉNIENTS ET AVANTAGES ASSOCIÉS AU PROJET DE RECHERCHE

Outre le temps consacré à la participation à ce projet de recherche, il existe un risque que vous ressentiez une légère fatigue et que vous ressentiez certaines émotions négatives comme de l'anxiété ou de la gêne pendant ou après avoir complété l'évaluation psychologique et rempli les questionnaires en ligne. Ces émotions sont normales dans le cadre d'une évaluation. Vous ne retirerez pas de bénéfices de votre participation à ce projet de recherche. Nous espérons que les résultats obtenus contribueront à l'avancement des connaissances scientifiques dans le domaine du trouble obsessionnel-compulsif. Vous recevrez une compensation financière de 50 $ pour votre participation à ce projet de recherche qui vous sera envoyée par virement Interac. Puisque votre consentement est donné à distance, il existe un risque de divulgation de votre participation à un tiers non-autorisé si le présent formulaire de consentement est retourné signé par courriel. Cela peut se produire si le consentement est retourné à la mauvaise adresse ou advenant une interception et une utilisation malveillante du contenu de la communication. Si vous souhaitez consentir à la recherche autrement, veuillez en faire part à l'équipe de recherche qui vous proposera des alternatives.

PARTICIPATION EN LIGNE

Dans le cadre de ce projet de recherche, des logiciels en ligne de collecte de données et de vidéoconférence seront utilisés (par ex. : Zoom Santé, Checkbox). Lorsque vous visitez les sites Web de ces Logiciels, le navigateur de votre appareil envoie automatiquement des informations au serveur du site. Par exemple, l'adresse IP, la date et heure d'accès ainsi que les détails du système d'exploitation et de l'appareil utilisé pourraient être collectées. Seules les données nécessaires à la prestation et l'optimisation du service sont collectées par ces sites.

PARTICIPATION VOLONTAIRE ET DROIT DE RETRAIT

Votre participation à ce projet de recherche est volontaire. Vous êtes donc libre de refuser d'y participer. Vous pouvez également cesser de répondre au questionnaire en ligne à tout moment. Vous pouvez également vous retirer de ce projet à n'importe quel moment, sans avoir à donner de raisons, en informant l'équipe de recherche.

CONFIDENTIALITÉ

Tous les renseignements recueillis dans le cadre de ce projet de recherche demeureront confidentiels dans les limites prévues par la loi. Vos données personnelles vous seront demandées lors du premier contact avec l'équipe de recherche et seront subséquemment protégées dans un fichier protégé par mot de passe sur les serveurs sécurisés du CR-IUSMM. Après avoir répondu

aux critères d'admissibilité à l'étude, l'équipe de recherche vous assignera un numéro de code d'identification unique, ce qui permettra aux chercheurs de lier les données récoltées à votre sujet à l'évaluation psychologique et à la passation du sondage de questionnaires en ligne. La clé du code reliant votre nom à votre dossier de recherche sera conservée par le chercheur responsable de ce projet de recherche. Pour répondre au sondage de questionnaires en ligne, vous devrez ainsi utiliser ce code d'identification unique. Dans le sondage de questionnaires en ligne, vos données personnelles, telles que votre nom, votre date de naissance, votre adresse courriel, etc. ne vous seront pas demandées afin de protéger votre confidentialité en ligne. Les données de recherche seront conservées pour une durée minimale de 7 ans par le chercheur responsable de ce projet de recherche. Les données pourront être publiées ou faire l'objet de discussions scientifiques, mais il ne sera jamais possible de vous identifier.

IDENTIFICATION DES PERSONNES-RESSOURCES

Si vous avez des questions ou éprouvez des problèmes en lien avec le projet de recherche, vous pouvez communiquer avec Louis-Philippe Baraby, le doctorant en psychologie responsable de cette étude par téléphone: [redacted] ou par courriel : louis-philippe.baraby@umontreal.ca [redacted]

Une liste de ressources (Suicide Action, Revivre) sera aussi mise à votre disposition à la fin du questionnaire si vous ressentez le besoin de parler de votre expérience. Pour toute question concernant vos droits en tant que participant à ce projet de recherche ou si vous avez des plaintes ou des commentaires à formuler, vous pouvez communiquer avec le Commissaire aux plaintes et à la qualité des services du CIUSSS de l'Est-de-l'Île-de-Montréal au 514-252-3400, poste 3510. Le comité d'éthique de la recherche du CIUSSS de l'Est-de-l'Île-de-Montréal a approuvé le projet et en assurera le suivi.

CONSENTEMENT

J'ai pris connaissance du formulaire d'information et de consentement et je comprends la nature du projet de recherche. On a répondu à mes questions, si j'en avais, et on m'a laissé le temps voulu pour décider de participer. Dans le cas où mon consentement est retourné par courriel, je comprends que ceci augmente le risque de divulgation de ma participation à des tiers non autorisés. Après réflexion, je consens à participer à ce projet de recherche et aux conditions qui y sont énoncées.

_____

Nom du participant

_____

Signature Date

Appendix C: Novel Task-Based Measure

Dysfunctional Reasoning Processes Task (DRPT)

T.P.R.M.

Instructions : Veuillez lire attentivement chacun des scénarios suivants. Pour chaque scénario, veuillez indiquer dans quelle mesure vous êtes en accord ou en désaccord avec la logique du raisonnement du personnage. Le raisonnement du personnage est présenté entre guillemets dans chaque scénario (« »). Veuillez seulement utiliser l'information présentée dans les scénarios pour guider votre réponse.

Réponses possibles

1	2	3	4	5	6	7
Fortement en désaccord	En désaccord	Quelque peu en désaccord	Neutre	Quelque peu en accord	En accord	Fortement en accord

#	Scénario	Question	Réponse (1 à 7)
1	Scénario : En faisant son jogging dans la rue, Andy croise un passage piéton. Alors qu'il attend pour traverser la rue, il observe un banc qui a été récemment installé l'autre côté de la rue. Il arrive au banc et s'apprête à s'asseoir dessus lorsqu'il a soudainement la pensée suivante : « Ce banc pourrait avoir été touché par plusieurs personnes, donc il pourrait être sale. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement d'Andy?	
2	Scénario : Félicia est assise à l'ordinateur et lit à propos des petits appareils électroménagers de cuisine sur un site web. L'un des articles présente l'histoire d'une maison qui a brûlé à cause d'un feu causé par des fils électriques défectueux dans un appareil de cuisine. Se rappelant alors qu'elle a un grille-pain dans sa propre cuisine, Félicia se dit à elle-même : « Si cette histoire est arrivée à l'appareil de quelqu'un d'autre, alors cela pourrait aussi arriver à mon grille-pain. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Félicia?	
3	Scénario : Rose vient de déménager dans un nouvel appartement et a presque terminé de défaire ses boîtes. En serrant ses livres sur une étagère, elle les organise par couleur. Une fois terminée, elle se dit à elle-même :« Je peux voir que ces livres sont parfaitement organisés par couleur, mais il se pourrait que je ne voie pas que l'un d'eux est dans le mauvais ordre de couleur. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Rose?	

4	Scénario : Calvin est garé dans le stationnement de l'épicerie après avoir fait ses courses. Il démarre sa voiture et se dirige lentement vers la sortie du stationnement. Alors que Calvin attend qu'une personne âgée traverse lentement devant lui, il se dit soudainement à lui-même : « Peut-être que je vais complètement perdre la raison, et que je pourrais frapper cette personne âgée avec ma voiture. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Calvin?	
5	Scénario : Denis visionne de la pornographie hétérosexuelle sur son ordinateur, puisque ceci l'excite normalement. Il se sent soudainement plutôt ennuyé et se met à regarder le physique de l'homme dans la scène et à admirer la figure et la forme de son corps. Il se dit ensuite à lui-même : « Peut-être que le fait que je n'étais pas intéressé envers la femme dans la scène et que j'admirais le corps de l'homme indique que je suis gai. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Denis?	
6	Scénario : Steve est à une fête et attend que ses meilleurs amis, Sam et John, y arrivent. Sam et John ont dit à Steve qu'ils voyageraient ensemble et qu'ils arriveraient vers 19h00. Steve regarde sa montre, qui indique qu'il est 19h05, et il se dit à lui-même : « Le train dans lequel Sam et John voyagent pourrait être tombé en panne, donc ils pourraient être en retard à la fête. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Steve?	
7	Scénario : Brandon est avec sa petite amie, Lucie, au souper de mariage de sa sœur. Il sait que Lucie a préparé un discours pour sa sœur et qu'elle souhaite le présenter avant que le dessert soit servi. Il quitte la table pour la laisser se préparer calmement et se dit à lui-même : « Lucie semble calme, mais peut-être qu'elle cache son anxiété et que sa bouche est sèche. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Brandon?	
8	Scénario : Carl relaxe sur son divan et lit une revue. Un des articles discute de la forte prévalence des personnes étant infectées avec l'Hépatite C, et comment ce virus peut survivre pendant des semaines sur certaines surfaces. Carl regarde alors ses propres mains et se dit à lui-même : « Les virus peuvent survivre à l'extérieur du corps pendant des semaines, donc ils pourraient être sur mes mains en ce moment même. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Carl?	
9	Scénario : Mélinda habite seule en appartement. Elle quitte son domicile et attend l'autobus express à l'extérieur de son appartement qui l'amènera à l'aéroport, puisqu'elle doit	Dans quelle mesure êtes-vous d'accord	

	se rendre à New York pour un voyage d'affaires de cinq jours. En attendant l'autobus, elle se dit à elle-même : « Il se pourrait que le robinet de la cuisine soit en train de couler, donc il pourrait y avoir des dégâts d'eau dans la maison à mon retour. »	avec la logique du raisonnement de Mélinda?	
10	Scénario : Marc reçoit un appel de sa collègue de travail, Clara, qui est normalement très diligente. Elle lui raconte qu'elle vient tout juste de passer trois heures à corriger toutes ses copies d'examen à nouveau parce qu'elle avait mal calculé les notes de ses étudiants. Se rappelant alors qu'il a lui-même passé beaucoup de temps à corriger les copies d'examen de ses étudiants, Marc se dit à lui-même : « Si Clara a mal calculé ses notes, il se pourrait que je n'aie pas parfaitement calculé mes notes moi aussi. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Marc?	
11	Scénario : Alice et un étranger font la file et attendent l'autobus sur une route passante. Alice se rappelle avoir entendu aux nouvelles qu'un homme a récemment poussé plusieurs personnes dans la rue devant un autobus, les blessant grièvement. Alice se dit immédiatement à elle-même : « Si cet homme aux nouvelles a poussé des gens devant un autobus, alors je pourrais faire la même chose à cet étranger devant moi. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement d'Alice?	
12	Scénario : Diana a récemment emménagé dans un appartement avec un colocataire et achève les préparations pour leur fête de pendaison de crémaillère prévue pour ce soir. Après avoir mis des croustilles dans un bol sur la table, elle réalise qu'elle a oublié d'acheter un gâteau pour l'occasion et se dirige rapidement vers une boulangerie tout près de chez elle. Alors qu'elle regarde les gâteaux, elle se dit à elle-même : « Mon colocataire pourrait avoir faim, donc il se pourrait qu'il ait tout mangé les croustilles. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Diana?	
13	Scénario : Dolores se rend en autobus à sa première journée à un nouveau travail, vêtue de ses plus beaux vêtements. Il ne reste qu'un seul siège libre à l'intérieur de l'autobus. Voyant que celui-ci semble propre, Dolores se dit à elle-même : « Je ne vois peut-être pas de saleté, mais la saleté peut être invisible, donc le siège pourrait quand même être sale. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Dolores?	

14	Scénario : Sarah quitte son appartement et insère sa clé pour verrouiller la porte d'entrée. La serrure est assez vieille et il est difficile de tourner la clé. Sarah vérifie que la porte est verrouillée en agrippant la poignée de porte et se dit à elle-même : « Je sens que la porte est verrouillée, mais peut-être que le mécanisme intérieur de la serrure a mal fonctionné, donc la serrure pourrait toujours être déverrouillée. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Sarah?	
15	Scénario : Sébastien est au travail et écrit un courriel à son collègue. Il a révisé son courriel, puis cliqué sur « Envoyer ». Sébastien se dit à lui-même : « Je peux visuellement voir sur l'écran de l'ordinateur que le courriel a été envoyé, mais peut-être qu'il est resté dans la boîte de messages sortant sans avoir vraiment été envoyé. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Sébastien?	
16	Scénario : Denise a obtenu une promotion et a été transférée à un autre espace de travail. Ce nouveau bureau est équipé d'une chaise de travail ergonomique qui assure un support adapté somptueux que Denise vient tout juste de personnaliser à son corps. Alors qu'elle s'assoit sur cette chaise, Denise se dit à elle-même : « Il serait facile d'oublier l'une des options sur cette chaise parce qu'il y en a tellement, et donc il se pourrait que la chaise ne soit pas parfaitement adaptée à mon corps. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Denise?	
17	Scénario : Le père de Jack lui demande d'aiguiser tous les couteaux dans la cuisine. Après avoir aiguisé les couteaux, Jack les replace dans l'armoire à coutellerie. Alors qu'il est assis dans le salon et qu'il peut entendre son père en train de fouiller dans l'armoire à coutellerie, Jack se dit à lui-même : « L'un des couteaux que j'ai aiguisés pourrait avoir coupé la main de mon père, donc sa main pourrait être blessée. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Jack?	
18	Scénario : Alors qu'Hugo prépare le souper pour sa famille et qu'il coupe des légumes, sa conjointe le rejoint dans la cuisine, lui demande s'il a besoin d'aide et lui donne la bise. Hugo se demande ensuite s'il pourrait faire du mal à sa conjointe avec le couteau qu'il tient dans sa main. Il se dit ensuite à lui-même : « Je ne me sens pas violent, mais je pourrais inconsciemment vouloir lui faire du mal et je pourrais être, au fond, un psychopathe. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement d'Hugo?	

19	Scénario : Éric est un étudiant universitaire et habite avec un colocataire, David. Il revient à son domicile après l'école et remarque que David dort sur le divan dans le salon. Éric prend soin de ne pas faire de bruit lorsqu'il se dit à lui-même : « David semble dormir, mais peut-être qu'il est en fait malade. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement d'Éric?	
20	Scénario : Fred dîne avec sa collègue de travail, Linda. Elle lui explique qu'elle était pressée ce matin en quittant la maison et qu'elle a oublié de fermer la porte de garage, mais que son mari était heureusement encore à la maison à ce moment-là. Se rappelant alors qu'il a également quitté la maison à la hâte ce matin, Fred se dit à lui-même : « Si Linda a oublié de fermer sa porte de garage, j'ai peut-être laissé la mienne ouverte moi aussi. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Fred?	
21	Scénario : Louis cherche à acheter une propriété et visite une maison avec un agent d'immeuble. Rien n'y indique la présence de moisissure et il n'y a aucun signe de fuite ou de moisissure sur les murs et les plafonds. Louis se dit à lui-même : « La maison est magnifique et je ne vois aucun signe de moisissure, mais il y a peut-être de la moisissure que je ne peux pas voir derrière les murs. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Louis?	
22	Scénario: Stéphanie est assise à une table dans une aire de restauration. Elle devient très fatiguée en attendant que son amie rapporte de la nourriture. Elle pose ses bras nus directement sur la table et y appuie sa tête lorsque la pensée suivante lui vient soudainement en tête : « Cette table pourrait avoir été nettoyée avec des produits chimiques nocifs, donc mes bras pourraient être contaminés. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Stéphanie?	
23	Scénario : Cindy est au travail et rédige un courriel important pour un client qui doit être formulé parfaitement. Elle prend soin de rédiger chaque mot impeccablement. Une fois qu'elle a terminé de le réviser, elle se dit à elle-même : « Je n'ai pas vu d'erreur, mais il est facile de ne pas apercevoir une erreur lorsqu'on relit un courriel, donc le courriel pourrait toujours ne pas être parfait comme il le devrait. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Cindy?	
24	Scénario : L'un des loisirs préférés à David est de nager à la piscine de son quartier. Un jour, David constate que	Dans quelle mesure êtes-	

	deux jeunes garçons se changent dans le vestiaire et il se met à regarder leurs corps nus en les dévisageant un peu trop longtemps. Il se dit ensuite à lui-même : « Je ne me sens pas sexuellement attiré envers ces garçons, mais je pourrais avoir des désirs sexuels inconscients envers les enfants et je pourrais être un pédophile. »	vous d'accord avec la logique du raisonnement de David?	
25	Scénario : Juliette est au travail lorsque sa mère la téléphone à propos d'une jupe qu'elle a vue sur internet et qu'elle souhaite acheter pour elle. La jupe est offerte en plusieurs couleurs, et Juliette demande à sa mère de l'acheter en bleu. Après avoir raccroché le téléphone, Juliette se dit à elle-même : « La dernière fois que j'ai demandé à ma mère de m'acheter quelque chose, elle a fait une erreur dans la commande, donc cela pourrait arriver cette fois-ci aussi. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Juliette?	
26	Scénario : Chris vivait auparavant avec Brigitte, mais habite maintenant avec un nouveau colocataire, Tim. Il est 20h00 et il souhaite demander à Tim s'ils peuvent regarder un film ensemble. Il s'apprête à cogner sur la porte fermée de la chambre à Tim lorsqu'il se dit à lui-même : « Brigitte n'aimait pas que je cogne à sa porte à cette heure-ci, donc Tim n'aimera peut-être pas cela lui non plus. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Chris?	
27	Scénario : Joe a terminé de laver, sécher, plier et diviser ses chandails en deux piles afin qu'il puisse les serrer dans sa commode. Lorsqu'il serre la deuxième pile dans la commode, il remarque que l'un des chandails s'est légèrement déplié. Joe se dit alors à lui-même : « Si les chandails de la deuxième pile n'étaient pas pliés proprement, les chandails dans la première pile pourraient ne pas être pliés correctement eux aussi. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Joe?	
28	Scénario : À la fin de chaque journée, Jacob aide son équipe avec le restockage des étagères à la bibliothèque où il travaille. Une fois qu'ils ont terminé, son assistante Hélène mentionne qu'ils n'ont jamais eu à stocker autant de livres en une journée auparavant. Jacob se dit à lui-même : « Certains livres pourraient avoir été mal placés sur les étagères, et donc certains livres pourraient ne pas avoir été stockés parfaitement tels qu'ils le devraient. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Jacob?	
29	Scénario : Nick est assis à son bureau au travail lorsqu'il se souvient qu'il a laissé un document important dans sa voiture qui est garée dans le stationnement. Il retourne à	Dans quelle mesure êtes-vous d'accord	

	sa voiture, récupère le document, et verrouille sa voiture. Alors qu'il est sur le chemin du retour vers son bureau, il se dit à lui-même : « Je parie que le mécanisme de verrouillage de ma voiture pourrait être défectueux, donc ma voiture pourrait être déverrouillée. »	avec la logique du raisonnement de Nick?	
30	Scénario : Louise fait le ménage après son quart de travail à la cafétéria de l'école. Elle remarque qu'une des tables est sale et essuie la saleté avec un linge. Elle regarde alors les chaises qui sont autour de la table et se dit à elle-même : « Si la table était sale, les sièges pourraient être sales eux aussi. »	Dans quelle mesure êtes-vous d'accord avec la logique du raisonnement de Louise?	

Appendix D: Questionnaires

Beck Anxiety Inventory (BAI)

Beck Depression Inventory – II (BDI-II)

Depression, Anxiety and Stress Scales – 21-item version (DASS)

Fear of Self Questionnaire (FSQ)

Inferential Confusion Questionnaire – Extended Version (ICQ-EV)

Obsessive Beliefs Questionnaire (OBQ)

Vancouver Obsessional-Compulsive Inventory (VOCI)

Inventaire d'anxiété de Beck

Voici une liste de symptômes courants dus à l'anxiété. Veuillez lire chaque symptôme attentivement. Indiquez, en inscrivant un « X »dans la colonne appropriée, à quel degré vous avez été affecté(e) par chacun de ces symptômes au cours de la dernière semaine, aujourd'hui inclus.

		Pas du tout	**Un peu** Cela ne m'a pas beaucoup dérangé	**Modérément** C'était très déplaisant mais supportable.	**Beaucoup** Je pouvais à peine le supporter.
1.	sensations d'engourdissement ou de picotement				
2.	bouffées de chaleur				
3.	"jambes molles", tremblements dans les jambes				
4.	incapacité de se détendre				
5.	crainte que le pire ne survienne				
6.	étourdissement ou vertige, désorientation				
7.	battements cardiaques marqués				
8.	mal assuré(e), manque d'assurance dans mes mouvements				
9.	terrifié(e)				
10.	nervosité				
11.	sensation d'étouffement				
12.	tremblements de mains				
13.	tremblements, chancelant(e)				
14.	crainte de perdre le contrôle				
15.	respiration difficile				
16.	peur de mourir				
17.	sensation de peur, "avoir la frousse"				
18.	indigestion ou malaise abdominal				
19.	sensation de défaillance ou d'évanouissement				
20.	rougissement du visage				
21.	transpiration (non associée à la chaleur)				

 Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56,* 893-897. Traduit avec la permission de l'auteur par Mark H. Freeston. Freeston, M. H., Ladouceur, R., Thibodeau, N., Gagnon, F., & Rhéaume, J. (1992). L'Inventaire d'anxiété de Beck: Propriétés psychométriques d'une traduction française. *L'Encéphale, XX*, 47-55.

Inventaire de dépression de Beck-v2

No participant : _____
Temps de mesure : PRE – POST

Ce questionnaire contient des groupes d'énoncés. Lisez attentivement tous les énoncés pour chaque groupe, puis entourez le chiffre correspondant à l'énoncé qui décrit le mieux la façon dont vous vous êtes senti(e) au cours des deux dernières semaines, incluant aujourd'hui. Si, dans un groupe d'énoncés, vous en trouvez plusieurs qui semblent décrire également bien ce que vous ressentez, choisissez celui qui a le chiffre le plus élevé et encercler ce chiffre. Assurez-vous de choisir qu'un seul énoncé dans chaque groupe.

1.
0 Je ne me sens pas triste.
1 Je me sens très souvent triste.
2 Je suis tout le temps triste.
3 Je suis si triste ou si malheureux (se) que ce n'est pas supportable.

2.
0 Je ne suis pas découragé(e) face à mon avenir.
1 Je me sens plus découragé(e) qu'avant face à mon avenir.
2 Je ne m'attends pas à ce que les choses s'arrangent pour moi.
3 J'ai le sentiment que mon avenir est sans espoir et qu'il ne peut qu'empirer.

3.
0 Je n'ai pas le sentiment d'avoir échouée dans la vie, d'être un(e) raté(e).
1 J'ai échoué plus souvent que je n'aurais dû.
2 Quand je pense à mon passé, je constate un grand nombre d'échecs.
3 J'ai le sentiment d'avoir complètement raté ma vie.

4.
0 J'éprouve toujours autant de plaisir qu'avant aux choses qui me plaisent.
1 Je n'éprouve pas autant de plaisir aux choses qu'avant.
2 J'éprouve très peu de plaisir aux choses qui me plaisaient habituellement.
3 Je n'éprouve aucun plaisir aux choses qui me plaisaient habituellement.

5.
0 Je ne me sens pas particulièrement coupable.
1 Je me sens coupable pour bien des choses que j'ai faites ou que j'aurais dû faire.
2 Je me sens coupable la plupart du temps.
3 Je me sens tout le temps coupable.

6.
0 Je n'ai pas le sentiment d'être puni(e).
1 Je sens que je pourrais être puni(e).
2 Je m'attends à être puni(e).
3 J'ai le sentiment d'être puni(e).

Beck, A. T., Steer, R. A. et Brown, G. K. (1998). Inventaire de Dépression de Beck. Toronto, Ontario, Canada: The Psychological Corporation.

7. 0 Mes sentiments envers moi-même n'ont pas changé.
1 J'ai perdu confiance en moi.
2 Je suis déçu(e) par moi-même.
3 Je ne m'aime pas du tout.

8. 0 Je ne me blâme pas ou ne me critique pas plus que d'habitude.
1 Je suis plus critique envers moi-même que je ne l'étais.
2 Je me reproche tous mes défauts.
3 Je me reproche tous les malheurs qui arrivent.

9. 0 Je ne pense pas du tout à me suicider.
1 Il m'arrive de penser à me suicider, mais je ne le ferais pas.
2 J'aimerais me suicider.
3 Je me suiciderais si l'occasion se présentait.

10. 0 Je ne pleure pas plus qu'avant.
1 Je pleure plus qu'avant.
2 Je pleure pour la moindre petite chose.
3 Je voudrais pleurer, mais je n'en suis pas capable.

11. 0 Je ne suis pas plus agité(e) ou plus tendu(e) que d'habitude.
1 Je me sens plus agité(e) ou plus tendu(e) que d'habitude.
2 Je suis si agité(e) ou tendu(e) que j'ai du mal à rester tranquille.
3 Je suis si agité(e) ou tendu(e) que je dois continuellement bouger ou faire quelque chose.

12. 0 Je n'ai pas perdu d'intérêt pour les gens ou pour les activités.
1 Je m'intéresse moins qu'avant aux gens et aux choses.
2 Je ne m'intéresse presque plus aux gens et aux choses.
3 J'ai du mal à m'intéresser à quoi que ce soit.

13. 0 Je prends des décisions toujours aussi bien qu'avant.
1 Il m'est plus difficile que d'habitude de prendre des décisions.
2 J'ai beaucoup plus de mal qu'avant à prendre des décisions.
3 J'ai du mal à prendre n'importe quelle décision.

14. 0 Je pense être quelqu'un de valable.
1 Je ne crois pas avoir autant de valeur ni être aussi utile qu'avant.
2 Je me sens moins valable que les autres.
3 Je sens que je ne vaux absolument rien.

15. 0 J'ai toujours autant d'énergie qu'avant.
1 J'ai moins d'énergie qu'avant.
2 Je n'ai pas assez d'énergie pour pouvoir faire grand chose.
3 J'ai trop peu d'énergie pour faire quoi que ce soit.

16. 0 Mes habitudes de sommeil n´ont pas changé.
1a Je dors un peu plus que d'habitude.
1b Je dors un peu moins que d'habitude.
2a Je dors beaucoup plus que d'habitude.
2b Je dors beaucoup moins que d'habitude.
3a Je dors presque toute la journée.
3b Je me réveille une ou deux heures plus tôt et je suis incapable de me rendormir.

17. 0 Je ne suis pas plus irritable que d'habitude.
1 Je suis plus irritable que d'habitude.
2 Je suis beaucoup plus irritable que d'habitude.
3 Je suis constamment irritable.

18. 0 Mon appétit n'a pas changé.
1a J'ai un peu moins d'appétit que d'habitude.
1b J'ai un peu plus d'appétit que d'habitude.
2a J'ai beaucoup moins d'appétit que d'habitude.
2b J'ai beaucoup plus d'appétit que d'habitude.
3a Je n'ai pas d'appétit du tout.
3b J'ai constamment envie de manger.

19. 0 Je parviens à me concentrer toujours aussi bien qu'avant.
1 Je ne parviens pas à me concentrer aussi bien que d'habitude.
2 J'ai du mal à me concentrer longtemps sur quoi que ce soit.
3 Je me trouve incapable de me concentrer sur quoi que ce soit.

20. 0 Je ne suis pas plus fatigué(e) que d'habitude.
1 Je me fatigue plus facilement que d'habitude.
2 Je suis trop fatigué(e) pour faire un grand nombre de choses que je faisais avant.
3 Je suis trop fatigué(e) pour faire la plupart des choses que je faisais avant.

21. 0 Je n'ai pas noté de changement récent dans mon intérêt pour le sexe.
1 Le sexe m'intéresse moins qu'avant.
2 Le sexe m'intéresse beaucoup moins maintenant.
3 J'ai perdu tout intérêt pour le sexe.

Beck, A. T., Steer, R. A. et Brown, G. K. (1998). Inventaire de Dépression de Beck. Toronto, Ontario, Canada: The Psychological Corporation. 3/3

DASS21

Name: Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree or a good part of time
3 Applied to me very much or most of the time

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

FSQ

Veuillez noter votre niveau d'accord ou de désaccord avec les affirmations ci-dessous en utilisant l'échelle suivante:

Échelle: 1 2 3 4 5 6

1	2	3	4	5	6
Fortement en désaccord	En désaccord	Un peu en désaccord	Un peu en accord	En accord	Fortement en accord

	Réponse (1 à 6)
1. J'ai peur d'être parfois dégoûtant.	
2. J'ai parfois peur que mon identité soit infectée par les autres.	
3. Je remets souvent en question mon propre caractère.	
4. Je m'inquiète d'être peut-être une personne désorganisée.	
5. Une attention constante est requise pour m'assurer que je pense et je me comporte de façon appropriée.	
6. J'ai peur d'être une personne désordonnée.	
7. Je m'inquiète souvent de ce que mes pensées intérieures pourraient révéler de mon caractère.	
8. J'ai peur d'être une personne qui ne fait jamais les choses correctement.	
9. J'ai peur d'être peut-être une personne violente.	
10. Je m'inquiète d'être le genre de personne qui gâche toujours tout.	
11. J'ai peur d'être déformé.	
12. J'ai peur d'avoir l'air anormal.	
13. Je peux facilement m'imaginer que je suis le genre de personne qui devrait définitivement se sentir coupable.	

14. Je doute d'être le genre de personne qui fait les choses parfaitement.	
15. J'ai parfois peur qu'entrer en contact avec certaines personnes pourrait me ternir.	
16. J'ai parfois peur d'être le genre de personne qui commet des erreurs terribles.	
17. J'ai peur d'être terni.	
18. Je remets souvent en question mon caractère moral.	
19. Je doute souvent que je suis une personne responsable.	
20. Je m'inquiète d'être impure.	
21. J'ai peur d'être peu attrayant.	
22. J'ai peur d'être une personne très laide.	
23. J'ai peur d'être susceptible de causer des accidents.	
24. Je remets souvent en question ma santé mentale.	
25. J'ai peur d'être insouciant.	
26. Si les autres me connaissaient vraiment, ils auraient peur.	
27. Je m'inquiète d'être le genre de personne qui fait des choses dégoûtantes.	
28. Je peux facilement m'imaginer comme étant une personne révoltante.	
29. J'ai peur de devenir une personne répugnante.	
30. J'ai peur de devenir entaché.	
31. Il pourrait y avoir quelque chose qui cloche vraiment avec ce dont j'ai l'air.	

32. Souvent je doute d'avoir l'air normal.	
33. Je remets souvent en question mes propres intentions ou désirs.	
34. Je m'inquiète d'être une personne imprudente.	
35. J'ai parfois peur de regarder à l'intérieur de moi-même car j'ai peur de ce que je pourrais trouver.	
36. J'ai peur d'être une personne irresponsable et négligente.	
37. Je me sens comme si une mauvaise partie de moi-même cherchait toujours à s'exprimer.	
38. Je m'inquiète d'être une personne qui est sans égard pour les autres.	
39. Je m'inquiète d'être le genre de personne qui pourrait faire des choses très immorales.	
40. J'ai peur d'être « sale ».	
41. J'ai peur d'être peut-être défaillant.	
42. J'ai peur de paraître laid aux yeux des autres.	
43. Je m'inquiète souvent d'avoir un « agenda » négatif caché.	
44. J'ai peur de devenir une personne malpropre en étant proche de certaines personnes.	
45. Je m'inquiète d'être le genre de personne qui cause des accidents.	
46. J'ai peur du genre de personne que je pourrais être.	
47. Je m'accuse souvent d'avoir fait quelque chose de mal.	
48. J'ai peur du genre de personne que je pourrais devenir si je ne fais pas très attention.	
49. Je doute souvent que je suis une bonne personne.	

50. Je déteste être une personne irréfléchie.	
51. J'ai peur que les autres soient dégoûtés lorsqu'ils me voient.	
52. J'ai peur de ce que mon apparence pourrait avoir l'air auprès des autres.	
53. Je m'inquiète que des défauts de ma personne cause du tort aux autres.	
54. J'ai peur de ne pas être toujours attentif.	
55. Je crains que je sois peut-être une personne malpropre.	
56. J'ai peur de devenir le genre de personne que je déteste.	
57. J'ai peur que tout contact avec des personnes folles pourrait déteindre sur moi.	
58. Je sens souvent que je ne montre pas de manière honnête la réalité négative à l'intérieur de moi.	
59. J'ai peur d'être une personne repoussante.	
60. J'ai peur d'être pourri et infecté de l'intérieur.	
61. Je dois être très prudent afin d'éviter de faire quelque chose d'affreux.	
62. J'ai peur d'être contaminé de l'intérieur vers l'extérieur.	
63. J'ai peur de devenir une personne malade et infectée.	
64. J'ai peur d'être une personne irresponsable qui pourrait faire du mal aux autres.	
65. J'ai peur d'être répugnant.	

Merci d'avoir rempli le questionnaire!

Questionnaire sur les processus inférentiels (QPI-EV)

Veuillez noter votre accord ou désaccord avec les affirmations ci-dessous en utilisant l'échelle suivante:

1	2	3	4	5	6
fortement en désaccord	en désaccord	un peu en désaccord	un peu en accord	en accord	fortement en accord

	Réponse (1 à 6)
1. Je suis parfois plus convaincu par ce qui pourrait être là que par ce que je vois vraiment.	
2. J'invente parfois des histoires à propos de certains problèmes qui pourraient être là, sans faire attention à ce que je vois vraiment.	
3. Parfois, certaines idées invraisemblables semblent si réelles qu'on dirait qu'elles se réalisent vraiment.	
4. Parfois, mon cerveau devient très actif et un tas d'idées invraisemblables se présentent à mon esprit.	
5. Je peux être facilement absorbé par des choses peu probables que je ressens comme si elles étaient vraies.	
6. Je confonds souvent des événements différents comme étant semblables.	
7. J'ai souvent tendance à faire des liens entre des idées ou des événements alors que cela peut sembler invraisemblable aux yeux des autres ou même à mes propres yeux.	
8. Parfois, certaines de mes pensées dérangeantes changent ma façon de percevoir tout ce qui est autour de moi.	
9. Lorsque je suis absorbé par certaines pensées ou histoires, j'oublie parfois qui je suis ou où je suis.	
10. Mon imagination est parfois tellement puissante que je me sens pris au piège et incapable de voir les choses différemment.	
11. J'invente des règles arbitraires et je ressens ensuite l'obligation de m'y soumettre.	
12. Souvent, je ne peux discerner si quelque chose est sécuritaire car on ne peut pas se fier aux apparences.	
13. Parfois, toutes les possibilités invraisemblables qui traversent mon esprit me semblent réelles.	
14. Parfois, je suis tellement absorbé par certaines idées que je suis incapable de voir les choses autrement, même si j'essaie.	
15. Lorsque je me questionne sur la présence d'un problème, j'ai tendance à porter davantage attention à ce que je ne vois pas, qu'à ce que je vois.	
16. Même si je n'ai pas de preuves évidentes d'un problème, mon imagination peut me convaincre du contraire.	
17. Seulement le fait de penser qu'il pourrait y avoir un problème est une preuve suffisante pour moi qu'il y en a un.	

1	2	3	4	5	6
fortement en désaccord	en désaccord	un peu en désaccord	un peu en accord	en accord	fortement en accord

	Réponse (1 à 6)
18. Parfois, je suis si envahi par certaines idées que j'oublie complètement ce qui m`entoure.	
19. Souvent, lorsque je suis certain de quelque chose, un simple détail peut m'amener à tout remettre en doute.	
20. Parfois, je trouve des raisons invraisemblables pour expliquer un problème ou quelque chose qui ne va pas et ça me semble soudainement réel.	
21. Il m'arrive souvent de ne pas pouvoir me débarrasser de certaines idées, parce que j'arrive toujours à trouver des possibilités qui viennent les confirmer.	
22. Mon imagination peut me faire perdre confiance en ce que je perçois.	
23. Une simple possibilité a souvent autant d'impact sur moi que la réalité.	
24. Même si j'ai toutes sortes de preuves visibles qui contredisent l'existence d'un problème, j'ai tout de même le sentiment qu'il pourrait se produire.	
25. Même la plus faible des possibilités peut me faire perdre confiance en ce que je sais.	
26. Je peux imaginer quelque chose et finir par le vivre.	
27. Je suis plus souvent préoccupé par quelque chose que je ne peux pas voir que par quelque chose que je peux voir.	
28. Parfois, je pense à des possibilités bizarres qui me semblent réelles.	
29. Je réagis souvent à un scénario qui pourrait arriver comme si cela arrivait vraiment.	
30. Parfois, je suis incapable de dire si toutes les possibilités qui me viennent à l'esprit sont réelles ou non.	

Merci de votre collaboration!

Centre d'études troubles obsessionnel-compulsif et tics

tictactoc.org

Questionnaire sur les croyances obsessionnelles (QCO-20)

Cet inventaire énumère attitudes ou croyances que les gens peuvent avoir. Lisez chaque énoncé attentivement et décidez jusqu'à quel point vous êtes en accord ou en désaccord avec chacun d'entre eux.

Vous devez choisir le numéro qui décrit le mieux ce que vous pensez. Chaque personne étant différente, il n'y a pas de bonne ou de mauvaise réponse.

Pour décider si un énoncé représente bien votre façon de voir les choses, fiez-vous simplement à ce que vous pensez la plupart du temps.

Veuillez utiliser l'échelle suivante :

1	2	3	4	5	6	7
Tout à fait en désaccord	Modérément en désaccord	Un peu en désaccord	Ni en accord ni en désaccord	Un peu en accord	Modérément en accord	Tout à fait en accord

En choisissant vos cotes, essayez d'éviter d'utiliser le point milieu de l'échelle (4). Indiquez plutôt jusqu'à quel point vos propres croyances et attitudes sont en accord ou en désaccord avec chaque énoncé.

1	Si je ne suis pas absolument certain(e) de quelque chose, c'est sûr que je vais faire une erreur.	1	2	3	4	5	6	7
2	Si je ne prends pas de précautions supplémentaires, j'ai plus de chance que les autres d'être victime d'une tragédie ou encore d'en provoquer une.	1	2	3	4	5	6	7
3	Ça m'arrive plus souvent qu'aux autres personnes de me faire mal accidentellement ou de faire mal aux autres.	1	2	3	4	5	6	7
4	Même lorsque je suis prudent(e), je pense souvent que de mauvaises choses vont arriver.	1	2	3	4	5	6	7
5	Des événements dangereux vont se produire si je ne suis pas prudent(e).	1	2	3	4	5	6	7
6	Même si le danger est très improbable, je devrais essayer de le prévenir à n'importe quel prix.	1	2	3	4	5	6	7

7	Si je n'interviens pas quand je perçois un danger, alors je serai à blâmer pour toute conséquence.	1	2	3	4	5	6	7
8	Dans toutes sortes de situations quotidiennes, ne pas réussir à prévenir le danger est aussi mauvais que de faire délibérément du mal aux autres.	1	2	3	4	5	6	7
9	Pour moi, ne pas prévenir le danger est aussi mal que de causer du tort.	1	2	3	4	5	6	7
10	Pour moi, ne pas réussir à prévenir une tragédie est aussi mal que de la provoquer.	1	2	3	4	5	6	7
11	Pour moi, avoir de mauvaises impulsions est aussi mal que de passer à l'acte.	1	2	3	4	5	6	7
12	Avoir des pensées obscènes, agressives ou violentes veut dire que je suis une mauvaise personne.	1	2	3	4	5	6	7
13	Avoir de mauvaises pensées veut dire que je suis bizarre ou anormal(e).	1	2	3	4	5	6	7
14	Avoir des pensées intrusives veut dire que j'ai perdu le contrôle.	1	2	3	4	5	6	7
15	Avoir une mauvaise pensée n'est pas différent moralement de commettre une mauvaise action.	1	2	3	4	5	6	7
16	Pour être une personne qui a de la valeur, je dois être parfait(e) dans tout ce que je fais.	1	2	3	4	5	6	7
17	Je devrais être fâché(e) si je fais une erreur.	1	2	3	4	5	6	7
18	Pour moi, les choses ne sont pas correctes si elles ne sont pas parfaites.	1	2	3	4	5	6	7
19	Je dois continuer à travailler sur quelque chose tant que ce n'est pas fait exactement comme il faut.	1	2	3	4	5	6	7
20	Peu importe ce que je fais, ça ne sera pas assez bon.	1	2	3	4	5	6	7

Inventaire des obsessions-compulsions de Vancouver (VOCI)

Identifiez dans quelle mesure chaque phrase est vraie pour vous, en encerclant le chiffre correspondant. Assurez-vous de RÉPONDRE À CHAQUE ITEM sans prendre trop de temps pour un item en particulier.

Dans quelle mesure chacune de ces phrases est vraie pour vous?

	Pas du tout	Très peu	Peu	Beaucoup	Extrêmement
1. Je me sens contraint de vérifier une lettre à plusieurs reprises avant de l'envoyer.	1	2	3	4	5
2. Je suis souvent dérangé par mes pensées involontaires d'utiliser une arme tranchante.	1	2	3	4	5
3. Je me sens très sale après avoir touché à de l'argent.	1	2	3	4	5
4. J'éprouve beaucoup de difficultés à prendre des décisions insignifiantes.	1	2	3	4	5
5. Je me sens obligé d'être absolument parfait.	1	2	3	4	5
6. J'ai, à répétition, la même image ou la même pensée non voulue à propos d'un accident.	1	2	3	4	5
7. Je vérifie et revérifie les choses comme les robinets et les interrupteurs afin de m'assurer que le tout est bien fermé.	1	2	3	4	5
8. J'utilise une quantité excessive de désinfectant afin de me protéger moi-même ou ma maison des microbes.	1	2	3	4	5
9. Je me sens souvent obligé de mémoriser des choses inutiles (ex. numéro d'immatriculation des véhicules, instructions sur les étiquettes, etc.).	1	2	3	4	5
10. J'ai de la difficulté à faire mes corvées ménagères habituelles car ma maison est trop encombrée de choses que j'ai ramassées.	1	2	3	4	5
11. Après avoir décidé quelque chose, je m'inquiète habituellement de ma décision pendant un bon moment.	1	2	3	4	5
12. Je suis perturbé presque tous les jours par des pensées désagréables qui me viennent à l'esprit contre ma volonté.	1	2	3	4	5
13. Je passe beaucoup trop de temps à me laver les mains.	1	2	3	4	5
14. J'ai souvent de la difficulté à terminer les choses que j'entreprends car j'essaie de faire tout à la perfection.	1	2	3	4	5
15. Toucher la semelle de mes souliers me rend vraiment anxieux.	1	2	3	4	5
16. Je suis souvent contrarié par des pensées ou des images de nature sexuelle.	1	2	3	4	5
17. Je deviens très anxieux lorsque j'ai à prendre des décisions, même mineures.	1	2	3	4	5

Thordarson DS, Radomsky AS, Rachman S, Shafran R, Sawchuk CN, Ralph Hakstian A., The Vancouver Obsessional Compulsive Inventory (VOCI). Behav Res Ther. 2004 Nov;42(11):1289-314.Traduction française par Julie Charrette, Cathy Léveillé, Kieron O'Connor, Marie-Claude Pélissier et Édith St-Jean-Trudel, Centre de Recherche Fernand-Seguin, Août 2003.

	Pas du tout	Très peu	Peu	Beaucoup	Extrêmement
18. Je me sens obligé de suivre une routine stricte même lorsque je fais des choses ordinaires.	1	2	3	4	5
19. Je suis contrarié si mes meubles ou mes autres biens ne sont pas toujours exactement dans la même position.	1	2	3	4	5
20. Je ne peux m'empêcher de vérifier de façon répétitive si mes fenêtres ou mes portes sont barrées, même si j'essaie de résister à ces envies.	1	2	3	4	5
21. Je trouve cela très difficile de toucher à des vidanges ou à une poubelle.	1	2	3	4	5
22. Je deviens vraiment tendu ou contrarié lorsque je pense à jeter quelque chose.	1	2	3	4	5
23. Je suis extrêmement préoccupé par les microbes et la maladie.	1	2	3	4	5
24. Je suis souvent très en retard car je ne peux terminer des tâches quotidiennes à temps.	1	2	3	4	5
25. J'évite d'utiliser des téléphones publics afin d'éviter d'être possiblement contaminé.	1	2	3	4	5
26. Je suis gêné d'inviter des gens à la maison car elle est remplie de piles de choses sans valeur que j'ai accumulées.	1	2	3	4	5
27. J'ai continuellement des pensées ou des images dérangeantes et choquantes à propos de la mort.	1	2	3	4	5
28. Je suis souvent perturbé par mes pensées non voulues à propos de laisser échapper des obscénités ou des insultes en public.	1	2	3	4	5
29. Je m'inquiète beaucoup trop de savoir si j'ai choqué les autres.	1	2	3	4	5
30. Je suis souvent effrayé par des idées terrifiantes non voulues de me lancer ou de partir à courir dans le trafic.	1	2	3	4	5
31. Je compte presque tout le temps lorsque je fais une tâche routinière.	1	2	3	4	5
32. Je me sens très contaminé lorsque je touche à un animal.	1	2	3	4	5
33. Un de mes plus gros problèmes est de continuellement revérifier les choses.	1	2	3	4	5
34. J'ai souvent des pensées perturbantes et involontaires à propos de perdre le contrôle.	1	2	3	4	5
35. Je trouve cela quasiment impossible de décider de qu'il faut garder et ce qu'il faut jeter.	1	2	3	4	5
36. Je me sens fortement contraint de compter les choses.	1	2	3	4	5

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	Pas du tout	Très peu	Peu	Beaucoup	Extrêmement
37. Je vérifie de façon répétitive si mon four est fermé même si j'essaie de résister à cette envie.	1	2	3	4	5
38. Je deviens très contrarié si je ne peux compléter ma routine du coucher exactement de la même façon chaque soir.	1	2	3	4	5
39. Je suis très effrayé à l'idée d'avoir même un léger contact avec des sécrétions corporelles (urine, sang, sueur, etc.).	1	2	3	4	5
40. Je suis souvent très perturbé par mes pulsions non désirées de faire du mal à d'autres personnes.	1	2	3	4	5
41. Je passe beaucoup de temps chaque jour à vérifier et revérifier les choses.	1	2	3	4	5
42. J'ai beaucoup de difficultés à jeter des choses car j'ai peur de faire du gaspillage.	1	2	3	4	5
43. J'ai fréquemment besoin de vérifier à plusieurs reprises les choses telles que les interrupteurs, les robinets, les électroménagers et les portes.	1	2	3	4	5
44. L'un de mes plus gros problèmes est que je suis excessivement préoccupé par la propreté.	1	2	3	4	5
45. Je me sens obligé de conserver plusieurs choses telles que des vieux magazines, des journaux et des reçus car je crains la possibilité d'en avoir besoin dans l'avenir.	1	2	3	4	5
46. J'ai régulièrement des pensées ou images dérangeantes et inacceptables de nature religieuse.	1	2	3	4	5
47. J'ai tendance à être en retard dans mon travail car je répète souvent les mêmes choses à plusieurs reprises.	1	2	3	4	5
48. J'essaie de repousser mes prises de décisions car j'ai tellement peur de faire des erreurs.	1	2	3	4	5
49. J'ai souvent des pensées dérangeantes et involontaires à propos de la maladie.	1	2	3	4	5
50. J'ai peur d'utiliser des toilettes publiques même si elles sont très propres car je suis obsédé par les microbes.	1	2	3	4	5
51. Même si j'essaie de résister, je me sens contraint d'accumuler une grande quantité de choses même si je ne les utilise jamais.	1	2	3	4	5
52. J'ai des pensées immorales dérangeantes et non désirées et ce de manière répétitive.	1	2	3	4	5
53. L'un de mes plus gros problèmes est que je porte trop attention aux détails.	1	2	3	4	5
54. Je suis souvent perturbé par des pulsions non désirées visant à me faire du mal.	1	2	3	4	5
55. Je prends beaucoup trop de temps à quitter la maison chaque jour car je veux absolument que tout soit fait de façon exacte.	1	2	3	4	5

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Appendix E: Additional statistical analyses: Study 2, Article 2

The primary aims of the thesis were not to investigate whether one treatment type is more efficacious than the other (i.e. I-CBT versus ERP). However, we performed additional statistical analyses to investigate whether significant differences would be found on the change scores of OCD and dysfunctional reasoning measures (i.e. VOCI and DRPT respectively) when comparing treatment types. First, we performed independent sample t-tests by comparing VOCI scores for participants who received I-CBT and those who received ERP. It was found that after the two treatments, VOCI total scores in the I-CBT group (M=19.67; SD=18.07) were significantly higher ($t(33) = .28$, $p = .03$) than the ERP group (M=17.12; SD=34.50). It was also found that after the two treatments, VOCI symptoms of obsessions in the I-CBT group (M=5.28; SD=6.86) were significantly higher ($t(33) = .34$, $p = .05$) than in the ERP group (M=4.35; SD=9.20). No significant difference was found between treatment type for the remaining VOCI domains ($p > .05$). Further, we performed an independent sample t-test by comparing DRPT scores for participants who received I-CBT and those who received ERP. We found no significant difference between the two treatment groups for DRPT scores ($t(33) = -.93$, $p = .59$). Finally, we also performed a mixed design ANOVA with repeated measures to test for the interaction between treatments (I-CBT and ERP) and time (pre-post) on OCD symptoms and dysfunctional reasoning (i.e. inferential confusion as measured by the DRPT). No significant interaction was found. Results indicate that overall, both treatments provided similar efficacies on the reduction of OCD symptoms and inferential confusion as few significant differences were found between the groups. The above results should be interpreted with caution, as the sample sizes of both groups were quite small (i.e. 17 participants for ERP and 18 for I-CBT). Future research should investigate the above research questions by employing a large OCD sample to increase statistical power.