UNIVERSITÉ DU QUÉBEC À MONTRÉAL

INFÉRENCES ET OBSESSIONS : LES COGNITIONS DANS UNE POPULATION NORMALE ET ADOLESCENTE

ESSAI DOCTORAL

PRÉSENTÉ

COMME EXIGENCE PARTIELLE

DU DOCTORAT EN PSYCHOLOGIE

PAR

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JUNE 2014

Acknowledgements

First and foremost, I would like to thank my "co-supervisor", Dr. Kieron O'Connor for giving me a chance when no one would, for providing me with the exact amount of support and encouragement that I needed in order to feel motivated and excited about this project and about clinical research in general. I am grateful to my supervisor, Dr. Guilhème Pérodeau, for taking me on as a student, and for her input into this project. This project could not have been completed without the help of all of the members of the CETOCT team at the Fernand-Seguin Research Centre, specifically Frederick Aardema, Karine Bergeron, Stella-Marie Paridisis, and Anick Laverdure. Also, I am thankful to the teachers and administrative staff at both UQO and UQAM for their contribution to the completion of this project, and for providing an environment which encourages personal and professional growth.

I am most appreciative of my family and friends who have supported and encouraged me, but also put up with some of my moments of insanity. Thank you to my mum, Rosalie, and my sisters, Marie and Mireille, for being sources of inspiration, support, and guidance. Thank you to Anthony, for always being a constant in my life, and a beautiful soul. Also, I am very grateful to all of my loved ones for their understanding when I had to cancel our plans, or that I would be too busy to plan anything, and yet for them to be open when I was free to go out! Last, to Marc, my world, thank you for every single day.

Dedication

For my Papili, Oscar Lahoud

R.I.P

July 14, 1944 - July 16, 2013

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LIST OF ABBREVIATIONS AND ACCRONYMS

OCD	Obsessive-compulsive disorder
APA	American Psychiatric Association
ERP	Exposure response prevention
CAM	Cognitive appraisal model
OCCWG	Obsessive Compulsions Cognitions Working Group
IBA	Inference-based approach
OVI	Overvalued ideation
CT	Cognitive therapy
CBT	Cognitive-behavioural therapy
ICQ	Inferential confusion questionnaire
ICQ-EV	Inferential confusion questionnaire – expanded version
OC	Obsessive compulsive
IBT	Inference-based therapy
SCL-90-R	Symptom checklist 90 – revised
GSI	Global severity index
SOM	Somatisation
DEP	Depression
ANX	Anxiety
PHOB	Phobic anxiety
HOS	Hostility
PAR	Paranoid ideation
IS	Interpersonal sensitivity
PSY	Psychoticism

RÉSUMÉ

Bien que la thérapie cognitivo-comportementale (TCC), souvent sous la forme d'exposition et prévention de la réponse (ERP), est le traitement le plus commun pour le trouble obsessionnel-compulsif (TOC), autant chez les adultes que chez les adolescents, les personnes ayant certains sous-types de TOC (par exemple, des idées surévalué ou des obsessions égosyntones) ne montrent que des effets minimales à l'intervention. Étant donné le succès mitigé de traitements basés sur des modèles de comportementales et cognitivo-comportementales, certains chercheurs ont tourné leur attention exclusivement à des théories et à des modèles cognitifs de traitement. L'approche basée sur les inférences (ABI) pour le trouble obsessionnel-compulsif (TOC) a été présentée comme un modèle théorique cognitif fiable et efficace pour les adultes (O'Connor, Aardema et Pélissier, 2005). Son traitement cible les inférences initiales qui créent un doute qui est vain pour les personnes ayant un TOC. Le protocole de traitement pour l'ABI n'implique pas l'exposition ou la restructuration cognitive, mais plutôt il s'appuie sur les narrations personnelles et les interprétations sensorielles (O'Connor, Aardema et Pélissier, 2005). Récemment, une analyse systématique des modèles cognitifs du TOC chez les adultes a suggérée que ceux-ci peuvent être appliqués aux enfants et aux adolescents (Reynolds & Reeves, 2008). L'exploration des processus inférenciels dans une population adolescente peut être justifiée en raison de l'intérêt de développer davantage les approches de traitement différentes pour une population dont le besoin est marquant. L'importance d'étudier la présence des processus inférenciels dans une population non-clinique réside dans le fait qu'elle permettra ultimement de développer l'ABI comme un traitement alternatif adapté à une population d'adolescents souffrant de TOC.

Cet essai doctoral se divise en trois chapitres. Le chapitre I consiste en une introduction générale à l'ensemble de l'ouvrage et présente une synthèse des modèles théoriques du trouble-obsessif compulsif. Le chapitres II est présenté sous forme d'article. L'article se veut une exploration des processus inférenciels dans un échantillon d'adolescents, tout en validant le questionnaire sur les processus inférenciels (QPI-EV) pour cette population. L'analyse factorielle démontre clairement une solution unifactorielle qui explique 37,4 % de la variance des items. La cohérence interne du QPI-EV est très satisfaisante (a=0.94). Les processus inférenciels sont un procédé cognitif qui est présent même dans l'adolescence. Enfin, le chapitre III consiste en une discussion générale et une analyse critique sur les chapitres précédents. Les retombées cliniques de la thèse de même que les pistes de recherches futures y sont également soulignées.

Mots-clés : TOC, adolescents, cognitions, inférences, ABI, TCC

CHAPTER 1

GENERAL INTRODUCTION

GENERAL INTRODUCTION

1.1 Setting the context

For almost four decades, a cognitive-behavioural approach in the theory and treatment of obsessive-compulsive disorder (OCD) has been developing and evolving. It is portrayed by the means which the nature and severity of anxiety disorder is determined (i.e., symptoms, beliefs, and subtypes), and treated (e.g. ERP, CT, CBT). Given the mitigated success of treatments based on cognitive-behavioural models, researchers and clinicians have introduced, and continue to do so, novel cognitive-behavioural models and treatment protocols for OCD.

1.1.1 Diagnostic criteria and classification for OCD

The primary characteristics of OCD include recurrent obsessions and/or compulsions (American Psychiatric Association, 2003). Obsessions are persistent and repetitive thoughts, impulses, and images that cause marked distress due to their inappropriate and intrusive nature. Compulsions are excessive and repetitive rituals performed through mental acts and behaviours which aim to reduce anxiety, or the chance of a negative outcome occurring. In most cases, a person with OCD is aware of the unreasonableness of their obsessions and compulsions; however, with poor insight cases, the obsessions and compulsions will not be thought of as unrealistic or excessive (Clark, 2004).

Analysis of OCD symptoms has revealed subtypes such as contamination, checking, rumination, hoarding, religious, and symmetry/precision (O'Connor, Aardema, & Pelissier, 2005; Rasmussen & Eisen, 1992). Additional subtypes, such as impulsion phobia, somatic obsessions, and dysmorphobia have also been proposed

(Clark & O'Connor, 2004). Although OCD subtypes are fairly widely accepted, several limitations to subtyping have been identified and must be considered (Skoog & Skoog, 1999). First, the use of subtyping generally assumes that patients only manifest one behavioural subtype; however, clinical reality is that individuals with OCD often report several different types of obsessions and compulsions. Further, individuals with OCD often experience a change in primary subtype over time and over the course of the disorder.

1.1.2 Nature and course

Obsessive-compulsive disorder prevalence in the general population has been estimated at 1-2% (Kessler, Demier, Frank, et al., 2005). Its current primary treatment of choice is cognitive-behavioural therapy (CBT) (March, Frances, Carpenter, & Kahn, 1997). Meta-analyses of CBT for OCD have estimated that 75-85% of OCD patients benefit from this type of treatment (Abramowitz, 1996, 1997, 1998; Steketee & Shapiro, 1993; Hiss, Foa, & Kozak, 1994; van Balkom et al., 1994). However, even though reported benefits seem sizeable, approximately 37 % individuals with OCD drop out of therapy, refuse ERP, or fail to respond to treatment (Stanley & Turner, 1995).

1.2 Behavioural theoretical and treatment model of OCD

From the behavioural perspective, with its learning paradigm, emerged one of the first theory and treatment protocol for OCD. Because OCD is an anxiety disorder, its behavioural model and corresponding treatment draws upon the concept of phobia and exposure. A two-factor model of fear and avoidance presented by Mowrer (1939, 1960) proposed that normal intrusive thoughts, images, or impulses become associated with anxiety via classical conditioning so that when an intrusive thought occurs, anxiety increases (Clark, 2004). The person then learns, via operant

conditioning, to reduce obsessional anxiety by escaping or avoiding stimuli that evoke obsessional thoughts. Thus, compulsive behaviour is performed to escape from obsessional anxiety and is negatively reinforced by the reduction in anxiety that it engenders. Consequently, the obsessional anxiety is never extinguished.

An effective treatment for OCD, exposure and response prevention (ERP), is derived directly from this model and the notion that OCD patients have developed avoidance and escape habits that prevent the natural extinction of obsessional anxiety. Exposure and response prevention involves (a) exposure to stimuli that evoke obsessional distress and (b) assistance with resisting urges to avoid or escape using compulsive behaviours. This treatment is highly efficacious with an estimated 75% of treatment completers improving significantly and remaining improved at follow-up (Franklin & Foa, 2002). However, as mentioned earlier, limitations of ERP include that many patients refuse or prematurely discontinue this treatment because of the prospect of confronting obsessional fears (Stanley & Turner, 1995), and that efficacy is likely to be significantly less for patients who present with obsessions without overt compulsions (Rachman, 1997). In addition to the aforementioned limitations of behaviour therapy, it has been criticized for its failure to differentiate between the theoretical conceptualization of the range of anxiety disorders (Salkovskis, 1998).

1.3 Cognitive-behavioural theoretical and treatment models of OCD

The contemporary cognitive-behavioural model of OCD is based on beliefs and appraisals that are considered to be specific to OCD and critical in the development and maintenance of the disorder. This approach is based on Beck's cognitive specificity hypothesis (Beck, 1976). The cognitive specificity hypothesis posits that psychological disorders are caused or maintained by different underlying dysfunctional beliefs that are specific to respective psychological disorders. For example, depressive disorders are maintained by cognitions about helplessness and

hopelessness, whereas many anxiety disorders are maintained by threat appraisals. The cognitive-behavioural model of OCD suggests that individuals with obsessive-compulsive disorder have catastrophic or disproportionate reactions to normal events and stimuli; that is, relationships between situations with certain emotional consequences are grossly exaggerated (O'Connor & Robillard, 1995). Individuals with OCD engage in compulsive rituals in an effort to avoid, neutralize, or counter the imagined exaggerated negative consequences, and to attenuate distress. Cognitive-behavioural treatment for OCD adds the use of cognitive restructuring to modify dysfunctional beliefs that predispose individuals with OCD to react adversely to feared stimuli or to the intrusive thoughts that occur during exposure.

1.3.1 Cognitive appraisal models

Cognitive appraisal models (CAM) are centred on the basis that obsessions in individuals with OCD do not differ significantly from intrusive thoughts in non-OCD populations. Thus, the core of OCD is not intrusive cognitions, but rather the appraisal and interpretation of intrusive cognitions, as dictated by dysfunctional beliefs (Rachman & DeSilva, 1978; Salkovskis & Harrison, 1984). Research in this area supports this premise; several authors have shown that intrusive thoughts share content with obsessions in approximately 80-90% of non-OCD populations (Rachman & DeSilva, 1978; Salkovskis & Harrison, 1984).

Hypothesizing intrusions as a naturally occurring phenomenon prompted Salkovskis (1985) to put forward a cognitive appraisal model of OCD in which appraisals of intrusions, particularly responsibility appraisals, prompt compulsive behaviour. The model assumes that individuals with OCD appraise normal intrusions as signs that the risk for harm to themselves or to others is remarkably high, *and* that they are responsible for deterring such harm from happening. Intrusive thoughts pertaining to responsibility for preventing harm to the self or to others produces

anxiety and a subsequent urge to engage in neutralizing behaviour (i.e., compulsions to diminish distress.

Rachman (1997) proposed a cognitive theory of obsessions which precedes and was the foundation of Salkovskis' work. The theory hypothesizes that obsessions are triggered by catastrophic misinterpretations. Obsessions are predicted to persist for as long as the misinterpretations are maintained; the strength of the obsessions subsides only once the misinterpretations are eliminated. The primary difference between Rachman's and Salkovskis' model is that, for Rachman, misinterpreted thoughts (and subsequent obsessions) are not limited to responsibility appraisals; rather, any thought that is personally significant, threatening, or catastrophic may be misinterpreted, which then generates anxiety. Subsequently, individuals with OCD react to anxiety by resisting and suppressing the obsessions, which then develops neutralization and avoidance behaviours. In addition, the anxiety generated by the misinterpretations of the intrusive thoughts triggers a cycle of obsessions and personal significance. Rachman (1998) explained that the persistence, content, nature, and frequency of obsessions, as well as the internal and external triggers of the intrusion, are self-maintained. The presence and persistence of the obsessions is interpreted as an indication of the seriousness of the threat. The anxiety reaction to the threat is temporarily relieved by avoidance and/or neutralization, but anxiety subsequently recurs even more intensely as a function when efforts to control and suppress thoughts fail.

Following the development of the cognitive appraisal model for obsessions, Rachman (2002) proposed a detailed CAM for compulsive checking. The model suggests that compulsive checking occurs when individuals with an inflated sense of responsibility for preventing harm are uncertain that the perceived threat has been successfully reduced or removed. The presence, intensity, and duration of compulsive checking are determined by the degree of the individual's sense of responsibility, the

perceived probability of harm, and the anticipated seriousness of the potential harm. However, checking behaviour designed to determine safety create a self-perpetuating mechanism: checking increases perceived responsibility when certainty cannot be reached, and continuous checking decreases memory confidence.

Based on Salkovskis' and Rachman's models, and on findings that intrusions are a universal phenomenon, much of the cognitive research on OCD in the past two decades has focused on identifying the beliefs, cognitions, and appraisals instrumental in the development and maintenance of OCD (Clark, 2004). Such as the overestimation of threat (Carr, 1971), intolerance for uncertainty ('intolerance to ambiguity; Frenkel-Brunswick, 1949), and perfectionism are anxiety-related constructs that may or may not be specific to OCD. More recently, the following additional concepts have been proposed to be specific to OCD: thought-action fusion (TAF; Rachman & Shafran, 1999), the importance or necessity of controlling thoughts (Purdon & Clark, 2002), and general overimportance accorded to thoughts (Freeston, Rhéaume, & Ladouceur, 1996).

1.3.2 Meta-cognition and the process approach

Wells and colleagues have proposed a meta-cognitive model of OCD (Wells, 2000; Wells & Matthews, 1994). Meta-cognition includes beliefs, processes, and strategies that appraise, monitor, or control thinking (Gwilliam, Wells, & Cartwright-Hatton, 2004). The meta-cognitive model proposes that obsessional thoughts are interpreted negatively due to meta-cognitions about the meaning or danger of the thoughts. Wells and colleagues outlined two broad belief domains: 1) beliefs about the importance and power of thoughts, and 2) beliefs about the need to control thoughts or perform rituals. The first domain can be broken down into several themes; the following two are the most relevant: thought-action fusion (TAF; the belief that an obsessional thought can cause an unwanted or immoral action) and

thought-event fusion (the belief that an unwanted thought can cause a negative external event or the belief that the unwanted external event has already happened). Individuals with OCD assign special importance to the power and significance of intrusive thoughts, subsequently creating a pressing need to control the thoughts with rituals. According to this model, individuals with OCD must learn that intrusions and feelings can be inconsequential and do not necessarily require further attention or action.

1.3.3 Limitations to CAM

O'Connor and colleagues (O'Connor, Aardema, & Pélissier, 2005) have argued that it is contrived to conceptualize cognitive variables as beliefs and that OCD researchers should turn their attention to process variables. These authors have pointed out that several of the cognitive domains from the OBQ resemble process variables or meta-cognitions rather than particular beliefs. For example, the OCCWG (2005) defines overestimation of threat as *beliefs indicating an exaggerated estimation of the probability of harm*, and intolerance for uncertainty as *beliefs about the necessity of being certain*. O'Connor and colleagues (2005) maintain that many cognitive accounts of OCD fail to distinguish between cognitive content and cognitive distortions and processes, and that many of the OCCWG definitions of belief domains do not refer to specific beliefs, but efer rather to cognitive processes or cognitive distortions (O'Connor, Aardema, & Pélissier, 2005).

Process variables in OCD focus on cognitive operations, rather than on specific thoughts or content. Process variables range from formal approaches to general information processing to cognitive processes that focus on a specific domain of content, such as overestimation of threat. O'Connor and colleagues (e.g., O'Connor, Aardema, & Pélissier, 2005; O'Connor, Aardema, Bouthillier, Fournier, et al., 2005; O'Connor & Robillard, 1995, 1999) have suggested that a process-oriented

approach to OCD research may prove to be more fruitful than is the current approach focused on beliefs and appraisals. These authors do not believe that OCD is characterized by pervasive beliefs and feelings (in the manner that depression, for example, is characterized by hopelessness, helplessness, and feelings of worthlessness). They point to the idiosyncratic nature wide variety of obsessions that observed even in individuals with identified OCD subtypes. O'Connor and colleagues point out that there is no schema of specific beliefs related to OCD, but rather a general pattern or style of reasoning applied to a wide variety of mental content (O'Connor, Aardema, & Pélissier, 2005).

In their original description of a process approach to OCD, O'Connor and Robillard (1995) outlined the conceptual problems with the phobic model of OCD and corresponding exposure therapy. They suggested that, whereas an individual with a phobia fears a specific and tangible place or object, the obsessional aversion for an individual with OCD relates to the symbolic features of an object. O'Connor and Robillard listed four inconsistencies that contradict the phobic model of OCD. First, OCD patients' fears are inconsistent. Rather than avoiding all heights, or all dogs, or all enclosed spaces, individuals with OCD are selective within a stimulus category. So for example, a patient who claims to be averse to all things that are 'dirty' may not include mud, excrement, or paint in the category of 'things that are dirty.' Second, the selectivity discussed above is often associated with a second theme or category. For example, certain but not all *types* of people may be considered dirty. The third inconsistency in the phobic model is that individuals with OCD rarely incorporate reality into their fears, and may not even be able to accurately describe the feared stimulus or situation. For example, a man with an obsessive fear of ants was found to be unable to draw or even to describe an ant. His cue for searching frantically for ants was the memory of another time and place associated with ants. Unlike an individual with an ant phobia, he was not familiar with real ants (O'Connor & Robillard, 1995).

Finally, a central concept in the process approach is the running narrative observed in OCD patients; the OCD patient's narrative explains that the feared object might be present, and details how the patient knows or why they infer that the feared object is present. Finally, the narrative includes the consequences if the object were, in fact, present, although the very possibility that it is present is enough to produce neutralizing compulsions or rituals. In this way, the individual creates an imaginary sequence of events and proceeds to behave as though it were true (O'Connor & Robillard, 1995). Whereas an individual with a dog phobia becomes panicked at the sight of a real dog, OCD patients are guided by an imaginary narrative that creates fear about a stimulus that they cannot see but that *could* be present.

1.4 An Inference-Based Approach

Developed by O'Connor and colleagues (O'Connor & Robillard, 1995, 1999), the inference-based approach (IBA) to OCD bypasses the issue of idiosyncratic mental content by focusing on the reasoning processes associated with obsessions, rather than on specific beliefs or appraisals (O'Connor, Aardema, & Pélissier, 2005). The conceptualization of obsessions as inferences initially developed from clinical observations of OCD patients with overvalued ideation (OVI) (O'Connor & Robillard, 1995). Overvalued ideation refers to fixed beliefs with strong personal investment, and falls on a continuum between obsessions and delusions. O'Connor and Robillard (1995) proposed that individuals with OCD have beliefs that deviate to a great extent from objective and consensus reality. That is, the beliefs are not simply exaggeration of normal passing thoughts.

The inference-based approach deviates from other cognitive models of OCD in that it does not hypothesize the origin of obsessions in intrusive thoughts or in appraisals of those thoughts (O'Connor, Aardema, & Pélissier, 2005). Instead, this approach suggests that specific thoughts and their appraisals stem from initial doubts

and inferences. Rather than explicitly organizing mental themes, an IBA distinguishes the reasoning processes that form the justification for a particular obsession. Inference-based approach focuses on the tendency of individuals with OCD to subjectively interpret everyday encounters as if they possessed hidden threats to safety. The contradictory inference precedes the recognition of the specific trigger and its ensuing appraisal (Wu, Aardema, O'Connor, 2009).For the sake of simplicity to and due to limited space, the explanation of the IBA paradigm presented here is concise (for further details, see O'Connor, Aardema, & Pélissier, 2005). The differences between the IBA and the cognitive appraisal and meta-cognitive models are summarized in Table 1.

Table 1.1. Comparison of three cognitive models for OCD

	IBA	CAM	Meta-cognition
Theory of psychopathology	Specific cognitions and appraisals stem from initial doubts and inferences. Faulty reasoning brings about inferential confusion, fundamental elements to OCD.	Appraisal and interpretation of intrusive cognitions, which are shaped by dysfunctional beliefs, are core elements of OCD.	Obsessional thoughts are interpreted negatively because of meta-cognitions about the meaning or danger of the thoughts

Table 1.1 (continued). Comparison of three cognitive models for OCD

	IBA	CAM	Meta-cognition
Operational procedures	Narratives and sensory interpretations.	Cognitive restructuring and exposure.	Modification of metacognitive beliefs, and replacing maladaptive coping strategies with adaptive ones.
Limitations	Limited external replications of the treatment model and operational procedures.	Increased drop-out rates due to ERP. Overlap between belief domains and OCD subtypes.	The Meta-Cognitive Questionnaire cannot discriminate between OCD, GAD, and depression for 23% of cases in 240 participants.

1.4.1 Differences in Treatment Protocol: IBA versus CAM .

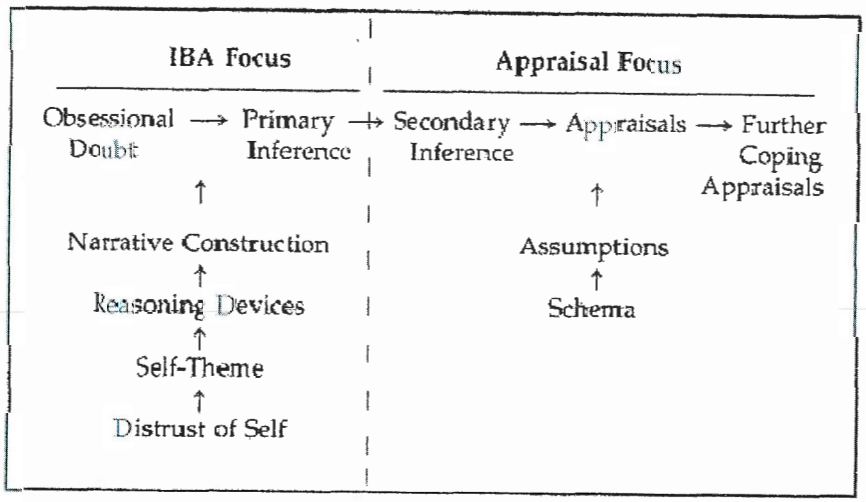
The inference-based approach is not incompatible with the cognitive appraisal model; rather, the two models target different stages in the obsessional sequence (Clark & O'Connor, 2004). As cognitive models of intervention, both IBA and CAM are designed to help individuals with OCD realize that their cognitive patterns generate maladaptive behaviours that create stress and, overall, amount to self-sabotage. According to the CAM, individuals with OCD treat their cognitions as important and compelling; they react excessively and abnormally to their thoughts due to the personal responsibility and risk of danger that they associate with the consequences of the cognitions (Clark, 2004; Rachman, 1997, 1998, 2002; Salkovskis, 1985). In treatment based on the CAM, patients' misinterpreted intrusive thoughts constitute targets for therapy.

Treatment based on the IBA targets the initial inferences that create unnecessary doubt for OCD patients; individuals with OCD learn early in the therapy process to distinguish between obsessional and genuine doubt. Inference-based therapy (IBT) does not involve cognitive restructuring or exposure; rather, it relies on narratives and sensory interpretations (for details, see O'Connor, Aardema, and Pélissier, 2005). For example, therapy for an individual who is in CBT for excessive washing and intrusive thoughts concerning bodily excrements would have two primary targets: (1) restructuring the patient's feelings/cognitions/core beliefs regarding contamination, and (2) exposing the patient to stimuli that elicit his irrational/excessive fear (e.g., contact a container of sweat, urine, and/or feces) to demonstrate the lack of danger in the action. In contrast, the same patient in inference-based therapy (IBT) would be asked to: (1) identify the very first time his intrusive thoughts became relevant and in what context in order to establish the development of pathological doubt and distrust of narratives (i.e., inferential confusion), and (2) learn to trust sensory information (e.g., if the patient's hands *feel* dry, if he does not *see* excrement with his *eyes*, and cannot *smell* excrement with his *nose*, then his hands are indeed clean). Clark and O'Connor (2004) have outlined the differences between treatment based on IBA and CAM in terms of the stage of OCD targeted for intervention (see Box 1).

O'Connor and colleagues (2005) conducted a study designed to explore the respective treatment impacts of IBT and CBT components (i.e., treating OCD at different stages). Fifty-four participants were randomly assigned to 20 once-weekly sessions of IBT, cognitive therapy (CT), or ERP. The ERP protocol did not address obsessional beliefs of any kind; rather, the primary focus was exposure and prevention of response. The CT protocol addressed appraisals and secondary inferences, using reality testing and cognitive challenges; intrusions were treated as universal. The IBT exclusively addressed primary inferences conceptualized as obsessive doubt. Reasoning processes were explored to target the ways that patients

arrived at faulty inferences, to establish the points at which patients begin to distrust their senses, and to invalidate patients' narratives by highlighting reasoning errors and inherent subjectivity. The results of this study demonstrated that the three treatments were equally effective, providing support for the role of cognitive approaches in reducing maladaptive behaviour.

Box 1.1 Differences in treatment protocol for IBT and CAM



Box from O'Connor, Aardema, and Pélissier (2005), p. 150, with permission

1.5 Adolescents and OCD

In the general population 1-4% are affected by OCD, making it the fourth most predominant psychiatric disorder (Farrell, Waters, Milliner, & Ollendick, 2012). Furthermore, investigations of children and adolescents have indicated that OCD affects 1% to 2.3% of that population (APA, 2003) and that up to 80% of cases occur during that developmental stage (Rasmussen & Eisen, 1992). Symptoms are often

experienced as distressing and intrusive and can disrupt the standard developmental trajectory by triggering impairment at school in work and in activities, as well as at home in their daily routines, and with their interpersonal relationships (Farrell et al, 2012), with imaginable lifelong implications if gone untreated. In terms of treatment, in a recent review Rapee, Schniering, and Hudson (2009) report that investigations into factors that affect treatment outcome and efficacy are generally not well conducted, and tend to be inconclusive. Nonetheless, it seems that the development and application of unconventional treatment delivery, such as self-help manuals and computer delivery treatment, have demonstrated good efficacy.

Regarding cognitive-behavioural models, Barrett and Healy (2003) found that there were very few differences between children with OCD and anxious children in terms of cognitive appraisals of threat; however, they both varied significantly from a non-clinical group. Therefore, cognitive processes that have been specifically implicated in the evolution and maintenance of OCD may not be fully established in children. However, investigators have found that responsibility attitudes, probability biases, and thought suppression strategies increase during adolescence and approximate to those of adults with OCD (Farrell & Barrett, 2006). This suggests that the IBA of OCD may be applicable to adolescents as they take part in more complex cognitive strategies. If this is the case, then inference-based treatment may be effective with this population. Given that childhood onset predicts adult morbidity, identifying effective interventions for this disorder in paediatric populations is imperative (Abramowitz, Whiteside, & Deacon, 2005).

1.6 Aims of research

The overall purpose of this paper is to expand on the empirical evidence for IBA by exploring the possibility of developing it for a population of adolescents with

OCD. More specifically, the first section of the essay summarized the current state of knowledge of psychological interventions for OCD and offers a reflection in this regard. In the second section, an article explores the possibility of developing an inference-based theoretical model, and its suitability, for an adolescent sample. Finally, the third section will be used to consider where we currently stand and where we should further explore in order to expand our understanding of OCD, and therefore better our interventions for individuals with OCD.

CHAPTER II

INFERENCES AND OBSESSIONS: COGNITIONS IN NON-CLINICAL ADOLESCENTS

This article will be submitted to *Journal of Psychopathology and behavioral assessment*

Running head: INFERENTIAL CONFUSION AND ADOLESCENTS

Inferences and obsessions: Cognitions in non-clinical adolescents

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Abstract

The inference-based approach (IBA) of OCD has been shown as a reliable and effective cognitive theoretical model for adults, and its therapy targets the initial inferences that create unnecessary doubt for OCD patients. Its treatment protocol does not involve exposure or cognitive restructuring; instead it relies on narratives and sensory interpretations (O'Connor, Aardema, & Pélissier, 2005). Recently, a systematic review of cognitive models of OCD for adults suggested that these can be applied to children and adolescents (Reynolds & Reeves, 2008). Exploring inferential confusion in an adolescent population can be justified due to the value of further developing diverse treatment approaches for a population in serious need. Therefore, the importance of exploring the presence of inferential confusion in a non-clinical adolescent population lies in its association to further develop IBT as a suitable alternate treatment for an adolescent population with OCD. This study aims to explore the presence of inferential confusion in an adolescent sample, while validating the Inferential Confusion Questionnaire-Extended Version (ICQ-EV) for this population. Ninety-eight adolescents in a non-clinical population completed the following questionnaires through an online computer survey: SCL-90-R, and the ICQ-EV. Findings demonstrated that the psychometric properties of the ICQ-EV for an adolescent sample were sound. The scale was found to have a clear-cut one factor structure. The internal consistency of the ICQ-EV was considerable. Inferential confusion is a cognitive process which is present even in adolescence. Implications for cognitive models of OCD for adolescents are discussed.

Key words: obsessive-compulsive disorder, adolescents, inferential confusion, inference-based approach, cognitive models

Inferences and obsessions: Cognitions in non-clinical adolescents

Individuals with obsessive-compulsive disorder (OCD) experience great distress and are at times debilitated (American Psychiatric Association (APA), 2003). Characteristic features of OCD include the presence of recurrent obsessions and/or compulsions that are both time consuming (lasting at least one hour per day), and cause significant impairment or marked distress (APA, 2003). Obsessions are recurring and unrelenting thoughts, images, and/or urges that cause marked apprehension due to their unfitting and intrusive nature. Compulsions are excessive and repetitive rituals performed through mental and behaviour acts which aim to reduce anxiety, and/or the chance of a negative outcome occurring. Over the past two decades, several studies have established that most individuals in the general population (80-90%) experience obsession-like intrusive thoughts, images, and impulses (Clark, 2004). Intrusions in the normal and OCD populations diverge in intensity and context rather than in kind. This implication is significant for OCD research because it allows investigating the disorder on a dimensional versus categorical scale (Julien, O'Connor, & Aardema, 2008). Furthermore, this information becomes important for a youthful population with OCD as the presentation and experiences of OCD in children and adolescents are similar to those reported amongst adults (March & Mulle, 1998). This disorder's prevalence is estimated to affect approximately 1% of adolescents (Karno, Golding, Sorenson, & Burman, 1988), and is often chronic, serious and hindering, and disruptive of adolescents' social, family and academic functioning (Piacentini, Bergman, Keller, & McCracken, 2003). More than 50% of adults with OCD identify the onset of their symptoms before the age of 18 years (Pauls, Alsobrook, Goodman, Rasmussen, & Leckman, 1995). The functional significance of the similarities between OCD in younger people and adult populations becomes crucial in attempts to apply theoretical models and treatment protocols, validated initially for adults with OCD, to younger people with OCD.

Research investigating the efficacy of CBT for children and adolescents with OCD has been growing (Barrett et al., 2008). Indeed, reviews have suggested that the dominant psychological treatment for children and adolescents with OCD is exposure and response prevention (ERP) (March, 1995). This treatment involves exposure to the feared obsessive situations, while simultaneously preventing the compulsive behaviours. Although there is evidence that ERP is effective in treating OCD in children and adolescents (e.g. Knox, Albano, & Barlow, 1996), it is associated with high drop-out rates, refusal of ERP, and failure to respond to treatment (Allsopp & Verduyn, 1990; Fisher & Wells, 2005). For this reason, the development of cognitive strategies has been suggested as an alternate treatment approach when ERP is not suitable (Salkovskis, 1999). Cognitive (CT) and cognitive-behavioural therapies (CBT), without ERP, have been found to be as effective as ERP for the treatment of OCD (Radomsky, Shafran, Coughtrey, & Rachman, 2010; Whittal, Thordarson, & McLean, 2005). The treatment protocol for CBT without ERP uses behavioural experiments, cognitive modifications, and cognitive and behaviour exercises aimed at decreasing negative physical sensations and affect (see Radomsky, Shafran, Coughtrey, & Rachman, 2010). Preliminary case reports suggest that CT and CBT, without the use of ERP, alone are suitable and effective for children and adolescents with OCD (for more details see Williams, Salkovskis, Forrester, & Allsopp, 2002).

Cognitive models may be more suitable for adolescents

While research concerning alternate cognitive therapies for adolescents with OCD is increasing, research into the role of cognitive characteristics of OCD amongst this population remains limited. A recent systematic review of cognitive models of OCD for adults suggested that these can be applied to adolescents (Reynolds & Reeves, 2008). However, before applying these models, researchers need to investigate the cognitive processes' similarities and differences between adults and adolescents with OCD. Several cognitive models and treatment protocols of OCD in adults have been proposed since Beck's cognitive specificity hypothesis (Beck, 1976). These include an inflated responsibility (Salkovskis, 1999), thought-action

fusion (TAF; Rachman & Shafran, 1999), meta-cognitive beliefs (Wells & Papageorgiou 1998), and an inference-based approach (IBA; O'Connor & Robillard, 1995, 1999). Each of these models assumes that an individual's cognitive experiences contribute to OCD. However, each model emphasizes unique processes in the development and maintenance of OCD. Some of these mentioned models have begun the exploration of cognitive processes in adolescents with OCD and /or without OCD (Matthews, Reynolds, & Derisley, 2006; Reeves, Reynolds, Coker, & Wilson, 2010).

Cognitive reasoning

The IBA of OCD is a cognitive approach which focuses on the reasoning processes associated with obsessions, rather than on specific beliefs or appraisals (O'Connor, Aardema, & Pélissier, 2005). All human beings engage in reasoning, the process in which abstract notions are developed into concrete ideas, conclusions, or decisions. Inductive and deductive reasoning are two methods of logic used to arrive at a conclusion based on information assumed to be true (Johnson-Laird, 1994). Both are used in research to establish hypotheses. Deductive reasoning arrives at a specific conclusion based on generalizations. It can be described as reasoning of the following form: if A, then B. For example, we know that all cats are mammals, Blackie is a cat, and therefore, Blackie is a mammal. Deduction is in some sense the direct application of knowledge in the production of new knowledge. Making deductions is important when we cannot directly observe a cause, and can only observe its consequences. Inductive reasoning takes events and makes generalizations. It involves trying to create general principles by starting with many specific instances. For instance, I have observed 100 cats. Of those cats, 50 out of 100 purred when I petted them. When I meet Blackie the cat and pet it, there is a 50% chance that it will purr. This is the kind of reasoning used if you have gradually built up an understanding of how something works. Rather than starting with laws and principles and making deductions, most people collect relevant experience and try to construct principles from it (Johnson-Laird, 1994). Therefore, induction is usually described as moving from the specific to the general, while deduction begins with the general and ends with the specific.

Inductive and deductive principled concepts can also be defined as mental models. Mental models are mental representations or mental simulations pertaining to the mental model theory of reasoning developed by Johnson-Laird (1980).

The theory of reasoning based on mental models can be applied to probabilistic thinking (Johnson-Laird, 1994). Deductive and inductive reasoning are used, with the help of sensory perceptions, to reach a decision, a conclusion, or probabilities. Sensory perceptions become concrete to us once they are represented visually or described by narrations (i.e. descriptions, stories). Often, before arriving at a conclusion/decision/probability, we must interpret and process all possible narrations/descriptions that take place in our mind. To do so, mental models, which are guided by our beliefs, knowledge, and premises, are used in the interpretation process in order to reach an inference (O'Connor, Ecker, Lahoud, & Roberts, 2012). Several of these narrations/descriptions will be imaginary, possibilities that did not occur, because of the vast array of possibilities which can be inferred. For instance, while cleaning a kitchen table a woman questions whether it is clean or not. The woman processes and interprets her sensory information (she sees with her eyes that it is clean, she touches with her hands and it feels clean). Throughout the sensory process and interpretation, she might play out imagined possibilities (the table was dirty yesterday when I ate on it, or the table was dirty earlier with the cat's hair while it rested there, therefore the table might still be dirty). The woman concludes her reasoning with the interpretation of her true sensory perceptions; she sees with her eyes that it is clean, she touches with her hands and it feels clean, therefore the table is clean.

Mental model of reasoning and doubt in OCD

As mentioned earlier in this text, the IBA of OCD focuses on the reasoning process in the development of OCD. This cognitive approach stipulates that OCD can develop in the reasoning method due to the individual's level of doubt (O'Connor, Aardema, & Pélissier, 2005). In IBA, the same reasoning course will be used in all human beings (sensory perceptions → interpretation/process →

narrations/descriptions, true and imagined possibilities = reasoning to arrive to a conclusion/decision), but with a critical difference: *doubtful* processing between true and imagined possibilities. O'Connor and colleagues have proposed that individuals with OCD have a tendency to come up with greater imagined possibilities, which then increases their doubt in their reasoning and brings about inferential confusion. Inferential confusion refers to a method of information processing where an individual ignores objective evidence (i.e. sensory perception) and accepts a remote possibility based entirely on subjective evidence. The remote possibility is accepted in the absolute absence of supportive evidence and even in spite of contradictory evidence (Wu, Aardema, & O'Connor, 2009). The individual with OCD does not react to what is there, and not even to the exaggeration of what is there, but to what *might possibly* be there even though their sensory perceptions say otherwise (O'Connor, Aardema, & Pélissier, 2005). Therefore, the woman cleaning the table in the previous example would have been involved in inferential confusion if she would have concluded her reasoning with the interpretation of her sensory perceptions as false (i.e. the table *might* still be dirty, even if I don't see it, because it was dirty yesterday).

As the above example illustrates, inferential confusion develops from a purely subjective justification and is therefore protected from the interpretation and assimilation of sensory information that could disprove the inference and allow the individual to free from the neutralizing ritual. It seems that an individual with OCD is involved in a cognitive process contrary to deductive reasoning (i.e., their cognitive process is contrary to the great fictional detective: Sherlock Holmes). Subsequently, when an obsession is not based on reality, real information cannot be used to contradict it. This creates a problem since the person engaged in a ritual in an effort to neutralize an obsession can never know when to stop the ritual (e.g. "If I can't see the dirt on the table, but 'know' that it *might* be there, when it is time to stop washing?"). Therefore, the use of exposure in treating OCD can be counterproductive and not suitable as the individual's obsessions are not based on reality, they do not trust their

sensory information throughout exposure, and they end up rehearsing the doubt instead of diminishing it.

The preceding cognitive reasoning process becomes available in early adolescence when cognitive functioning rapidly develops at this developmental stage. Reasoning and mental models evolve in adolescents and allow them to increase their cognitive flexibility and imagination (Piaget, 1950). This higher-level processing enables them to think about their future, assess possibilities, and establish objectives and ambitions (Keating, 1990). Subsequently, it is plausible that inferential confusion develops, or even begins, in youth due to the increased cognitive abilities recently attained in adolescence.

Empirical evidence for doubt and inferences

The inferential confusion cognitive process has been elaborated and validated both experimentally and psychometrically. Aardema and colleagues (2009) demonstrated in a recent study how individuals with OCD maintain higher levels of doubt than non-clinical participants. The authors, using an experimental reasoning task, showed that given an OCD-related narrative (e.g. While at an intersection, you accelerate when the light turns green. When you pass the intersection, you hear a scream and a bump) individuals with OCD, even after being given reality-based information (i.e. "You look in your rear-view mirror and see a pothole in the street"), are more influenced by possibility-based information (e.g. maybe the pothole wasn't deep enough to cause the bump I felt) and maintain their elevated levels of doubt. More specifically, the participants with OCD could not overlook the doubt caused by the imagined possibility-based information, and rejected the reality-based information provided. Therefore, these experiments illustrated the successful operationalization of the concepts of doubt and inferential confusion, as well as their role in OCD cognitive processes. Additional investigations reproduced these findings in OCD samples versus anxious non-OCD samples, as well as with OCD samples versus non-clinical samples (see Pélissier & O'Connor, 2002; Pélissier, O'Connor, & Dupuis, 2009). Furthermore, these findings have been replicated in independent samples

(Gangemi, Mancini, & van den Hout, 2007; Yorulmaz, Karanci, Bastug, Kisa, & Goka, , 2008).

Inferential confusion questionnaire

In order to assess the presence and strength of inferential confusion, Aardema and colleagues (Aardema, O'Connor, Emmelkamp, Marchand, & Todorov, 2005) developed the Inferential Confusion Questionnaire (ICQ). This measure of inferential confusion successfully differentiated between OCD participants from non-OCD anxious participants (Aardema et al., 2005). The original ICQ contained 15-items and targeted two domains: (a) inverse inference and (b) distrust of the senses, which have been stipulated to lead to invalid doubting inferences (e.g., Even with varying types of sensorial evidence against the presence of a particular danger, the feeling of its possibility remains) (Wu, Aardema, & O'Connor, 2009). The original ICQ contained the following items: *There are many invisible dangers, I am sometimes more convinced by what might be there than by what I actually see, I am more afraid of something that I cannot see than something that I can see,* and *I often react to a scenario that might happen as if it is actually happening*. The more recent 30-items expanded version of the ICQ (ICQ-EV; Aardema, Wu, Careau, O'Connor, & Dennie, 2010) includes the following additional reasoning processes related to inferential confusion: (1) irrelevant associations (e.g., *I often connect ideas or events in my mind that would seem far-fetched to others or even to myself*); (2) absorption into imaginary sequences at the expense of reality (e.g., *My imagination is sometimes so strong that I feel stuck and unable to see things differently*); (3) over-reliance on possibility (e.g., *Sometimes every far-fetched possibility my mind comes up with feels real to me*); and (4) category errors (e.g., *I often confuse different events as if they were the same*). Wu, Aardema, and O'Connor (2009) replicated findings that the ICQ-EV predicted obsessive-compulsive symptoms after controlling for depression, anxiety, and nonspecific distress. Also, the ICQ-EV has a stronger relationship with OC symptoms than with either anxious arousal or anhedonia. The use of the expanded version of the ICQ, as opposed to its earlier version, has been

recommended for both research and clinical practice (Aardema et al., 2010). It performed better in terms of reliability and test-retest reliability, and is more strongly related to most obsessive-compulsive symptoms. The ICQ-EV yielded a one factor solution (item/sample ratio = 3.1), while the original ICQ yielded a one-factor solution with an item/sample ratio of 5.7/1. The eigenvalue of the first factor for the ICQ-EV results was 15.9 explaining 49.6% of the variance, while for the original ICQ results for the first factor eigenvalue was 6.2 and it accounted for 41.5% of the variance. Finally, the internal consistency for the ICQ-EV results was 0.96, while it was 0.90 for the original ICQ. Moreover, the ICQ-EV was not as strongly related to other cognitive domains as the original version, so improving divergent validity (see Aardema et al., 2010 for more details). In addition, the revised version, unlike the original version, related significantly to checking compulsions while controlling for negative mood states and other cognitive domains.

The concept of inferential confusion in obsessive–compulsive behaviour in non-clinical samples has also been established (Emmelkamp & Aardema, 1999; Aardema, Kleijer, Trihey, O'Connor, & Emmelkamp, 2006). Inferential confusion was shown to have consistent moderate to strong relationships with OC symptoms in a non-clinical population. Aardema and colleagues (2009) have replicated these findings using both clinical and non-clinical samples. Strong relationships between results on the ICQ-EV and OC symptoms were found in all samples, independent of other cognitive domains and general distress. Furthermore, participants with OCD had higher scores on the ICQ-EV than did non-clinical controls and a control group of individuals with other anxiety disorders. Finally, significant change in ICQ-EV scores after treatment was demonstrated in OCD participants. This change in ICQ-EV scores was also related to successful treatment outcome.

Why explore inferences in non-clinical adolescents?

Currently, researchers and clinicians have limited information about the cognitive processes of younger populations in relation to OC symptoms. This scarcity of knowledge is surprising as the occurrence of OCD reaches a peak in mid-

adolescence and two-thirds of adult patients date the onset of their symptoms to childhood or adolescence (Rasmussen & Eisen, 1992). Furthermore, OC symptoms are often obscured by adolescents, and are often left untreated until adulthood (Chowdhury, Frampton, & Heyman, 2004). Greater availability of knowledge about the frequency and normality of OC symptoms in adolescence might increase reports of distress, thereby encouraging early detection and intervention. Information pertaining to OC symptoms and cognitive processes in adolescents could be used within a CT treatment framework to normalize individuals' experiences. A comparison of symptoms reported by adolescents and adults may help us to better understand the development of OC symptoms across early adult lifespan.

Exploring inferences in a non-clinical population is supported by previous research which has demonstrated continuity between OCD symptoms among clinical groups and the general populations. Analyses suggested that OC occurrences are common in non-clinical populations, and that subclinical OC occurrences are similar in construct and content to OCD symptoms (Clark, 2004; Tolin, Woods, & Abramowitz, 2003). Accordingly, the literature supports using non-clinical populations for exploring and understanding OCD.

Exploring inferential confusion in an adolescent population can be justified due to the value of further developing diverse treatment approaches for a population in serious need. Inference-based therapy (IBT) targets the initial inferences that create unnecessary doubt for OCD patients (e.g. distinguishing between obsessional and genuine doubt). Its treatment protocol does not involve exposure or cognitive restructuring, instead it relies on narratives and sensory interpretations (please see O'Connor, Aardema, and Pélissier (2005) for details). Therefore, the importance of exploring the presence of inferential confusion in a non-clinical adolescent population lies in its association to further develop IBT as a suitable alternate treatment for a young population with OCD, in order to decrease drop-out rates which are associated with refusal of undergoing ERP.

Inference-based approach of OCD has been shown as a reliable and valid cognitive theoretical model for adults with OCD. The ICQ-EV discriminates more efficiently obsessive-compulsive (OC) symptoms from other anxiety symptoms; while the IBT is a reliable alternative adult cognitive therapy to behavioural approaches. Questions remain as to whether adolescents have the capacity for inferential confusion, and if so, whether this phenomenon is associated with indices of OC symptoms in a normal adolescent population.

Aims of investigation

The current study aims to explore inferential confusion, with the help of the ICQ-EV, in an adolescent non-clinical population. It is hypothesized that 1) the ICQ-EV is a reliable measure of inferential confusion in an adolescent non-clinical sample, and that 2) its scores will be associated with OC symptoms. The results of this investigation will contribute to the advancement of understanding OCD by expanding the support of an inference-based cognitive approach. In addition, this study will aid in the exploration of cognitive features in an adolescent population in order to gain more knowledge of the etiology and maintenance of OCD, which would then further advance knowledge of treatment predictors.

METHOD

Participants

Ninety-eight English and French-speaking high school students (52 females and 46 males) from the St-Laurent and Ahuntsic boroughs were asked to anonymously (with the help of ID numbers) complete online forms by the *Centre d'Études sur les Troubles Obsessionnels-Compulsifs et les Tics* (CETOCT) (see Procedure for details). There were no inclusion/exclusion criteria for participation. Initially, 105 adolescents were contacted to complete the questionnaires, a total of 98 participated. The mean age of participants was 14.97 (SD = 0.72) years old with a range in age from 14-17 years. Participation for this study was on a voluntary basis

and participants were compensated with a $10 gift certificate immediately after participation. This project received ethical approval by the scientific evaluation committee of the Louis-H. Lafontaine hospital (see Appendix A).

Measures

The measures below were selected and included in this project for the following reasons: capacity for global screening of symptoms and cognitions, as well as economy in time and in quantity of questionnaires necessary. More specifically, we had to make use of measures which would take no more than 40 minutes to complete, in order to adhere to the time restrictions set by the schools. We specifically chose the SCL-90-R as it comprised several items relating to OC symptomatology, as well as neighboring symptoms with similar processes (i.e., psychosis and paranoia, anxiety, and phobia).

Symptom Checklist 90-Revised (SCL-90-R). The SCL-90-R (Derogatis, 1983) has been used in this study as a screening measure for psychological symptoms. The SCL-90-R is a widely used 90-item self-report questionnaire that includes nine subscales which target various domains of psychopathology, as well as three "global" scores such as a Global Severity Index (GSI) which is an average of all 90 items. These subscales were designed to measure symptoms associated with the constructs of somatization (SOM), depression (DEP), anxiety (ANX), phobic anxiety (PHOB), hostility (HOS), obsessive-compulsive behaviour (OC), paranoid ideation (PAR), interpersonal insensitivity (IS), and psychoticism (PSY). Symptoms are to be rated on a 5-point Likert scale (0 = not at all, 4 = extremely) indicating how frequently the individual has experienced these symptoms in the last week. Raw scale scores are not distributed normally; therefore norms are based on normalized t-scores. Also, due to gender differences found in the SCL- 90-R raw scores, separate norms are provided for men and women before transformation into t-scores. Many studies have provided support for the reliability and validity of the SCL-90-R and its subscales (see Derogatis, 1983). Some researchers have questioned the validity of the SCL-90-R's subscales because of their lack of specificity, and how greatly there are

intercorrelated (Cyr, Doxey, & Vigna, 1988; Cyr, McKenna-Foley, & Peacock, 1985). Therefore, it was stipulated that the instrument is appropriate only as a general measure of distress. However, due to the time constraints related to completing the questionnaires in a high school class, as well as the desire for an overall exploratory symptomatology investigation, this questionnaire offered the best overall option.

Inferential Confusion Questionnaire – Expanded Version (ICQ-EV). The ICQ-EV (Aardema et al., submitted for publication) is a 30-item revision of the original 15-item ICQ (Aardema et al., 2005). The ICQ-EV will be used to assess inferential confusion (imagined possibility versus real possibility based on sensory perception). Responses are made on a 6-point scale ranging from strongly disagree to strongly agree. The ICQ-EV has good internal consistency (coefficient alpha = .97 in an OCD sample and .96 in a French community group) and 12-week retest reliability (r = .90), as well as distinguishes OCD patients from both students and non-OCD anxiety patients (Aardema et al., submitted for publication).

Procedure

The first stage of protocol taken by the principal investigator was to create, with the help of an online survey and questionnaire tool software, the questionnaire package. Then, the second stage of protocol was to choose the high schools for recruitment. These were chosen out of convenience for the principal investigator (alumni at one, and living near the other). At the third stage of protocol, each school's principals for grades 15 and 16 were contacted via email in order to obtain permission for recruitment. Following that, the high school principals assigned specific teachers to settle the logistics involving the recruitment process (time and dates). At the fourth, and final, stage of protocol, the principal investigator visited the classes which took part in this study in order to collect the data for this project.

As mentioned earlier, data collection was completed through an online survey and questionnaire tool software. This data collection method was used for several reasons: efficacy in time-management to complete the questionnaires, automatic data entering, reduction of human error (entering data), as well as for confidentiality as

participants tend to be more honest in their responses online (Kam & Chismar, 2006). Furthermore, it turned out to be more environmentally friendly by decreasing the use of paper, which was a plus.

In the final stage of protocol, all students were approached in a computer science class in order to facilitate data collection with on-hand computers. The principal investigator visited following a few days of the teacher's announcement of the possibility for students to participate in this research project, and of the distribution of a letter addressed to the parents (see Appendix B). By then, the participants had given sufficient time to obtain a parent's authorisation to take part in this project if they were aged less than 14 years. At the school visit, the principal investigator provided the participants with verbal information pertaining to the study and informed consent. Following this, participants were provided with a link to complete the online forms through the online survey and questionnaire tool software, Survey Monkey. A nine digit ID number, in order to maintain their anonymity, was issued to them and was used to access the online forms. Once the internet link was accessed by the participants, they were asked to provide informed consent (See Appendix C). Participants were then asked to complete two questionnaires (see Appendix D) which are the measures described above. When the online form was submitted, a debriefing form indicated that participants were to be awarded their compensation shortly.

RESULTS

Descriptive statistics

Descriptive information on all measures is presented in Table 2.1. All variables were found to be normally distributed. Mean scores on the ICQ-EV for adolescents (M = 97.3; SD = 25.1) were elevated compared to previous studies with adults. Mean scores on the SCL-90-R T-scores were all within the normal range and are displayed in Table 2.1 and 2.2. More specifically, Table 2.2 offers percentile

information for where the SCL-90-R T-scores stand in terms of the general population. The subscales of interest for the SCL-90-R were OC, DEP, ANX, and PAR. The OC subscale was the most present in terms of depressive and anxious symptoms for this sample (girls 22% and boys 16%). Subscales related to somatization and personality sensitivity traits were strong for this sample as well (see Table 2.2).

A regression analysis exploring the relation between participants' age and ICQ-EV scores showed no significant effects ($R^2 = 0.01$, F (1,96) = 1.38, n.s.). An independent t-test for gender (girls ($M = 94.54$, $SD = 21.79$) and boys ($M = 96.03$, $SD = 26.30$)) and its link to the ICQ-EV scores revealed no significant effects (t (96) = 1.92, n.s.). An independent t-test for language-spoken (French ($M = 98.66$, $SD = 24.37$) and English ($M = 93.29$, $SD = 28.16$)) and its link to the ICQ-EV scores indicated no significant effects (t (96) = 0.73, n.s.).

Independent t-tests for gender (see Table 1 for means and standard deviations) and its link to the SCL-90-R T-scores revealed no significant effects for the OC (t (96) = 0.60, n.s.), PAR (t (96) = -0.73, n.s.), PSY (t (96) = -0.52, n.s.), ANX (t (96) = 1.08, n.s.), PHOB (t (96) = 0.67, n.s.), HOS (t (96) = 1.90, n.s.), and GSI (t (96) = 0.42, n.s.) subscales. However, independent t-tests for gender differences and the SCL-90-R T-scores were significant for the following subscales: DEP (t (96) = 2.12, $p < .05$) (girls (M = 37.85, SD = 10.73) and boys (M = 31.93, SD = 16.44)), and IS (t (96) = 2.40, $p < .05$) (girls (M = 41.92, SD = 11.46) and boys (M = 36.62, SD = 18.38)). Subscales of the SCL-90-R were all significantly positively intercorrelated ($r = .79$-$.32$, $p < 0.001$). So unsurprisingly all scores of the ICQ-EV were significantly positively correlated with the subscales of the SCL-90-R ($r = .60$-$.32$, $p < 0.001$). See Table 2.3 for all correlations between the SCL-90-R and the ICQ-EV.

Factor Analysis for HYPOTHESIS 1 (The ICQ-EV is a reliable measure of inferential confusion in an adolescent non-clinical sample.)

The items for the ICQ-EV were subjected to principal components analysis with oblimin rotation (ratio 3.7:1), similarly to Aardema and colleagues (2010) study

with adults. This was first done for the ICQ-EV data of boys and girls separately, as well as for English and French separately. However, as analyses essentially revealed the same pattern of results, only the findings for the total sample will be presented hereafter. Factor analysis yielded a one-factor solution that accounted for 37.42% of the variance with an eigenvalue of 11.23 (eigenvalues for the following 9 'factors' were 2.16, 1.80, 1.52, 1.38, 1.16, 1.10, 1.06, 0.99, and 0.90). A single factor solution showed item loadings ranging from 0.37 to 0.78. The average communality was 0.71. The average item loading was .60. Four items had a factor loading lower than 0.50 (items 1 "*I am sometimes more convinced about what might be there than by what I actually see*"; 10 "*My imagination is sometimes so strong that I feel stuck and unable to see things differently*"; 12 "*I often cannot tell whether something is safe, because things are not what they appear to be*"; and 15 *"In order to tell whether there is a problem or not I tend to look more for that which is hidden than what I can actually see"*). Finally, the internal consistency of the ICQ-EV scale was high: Cronbach's alpha was 0.94 for 30 items. The average item-total correlation was 0.57 (range .35 to .74).

A final factor analysis was completed without items 1, 10, 12, and 15. The factor analysis yielded a one-factor solution that accounted for 40.44% of the variance with an eigenvalue of 10.51 (eigenvalues for the following 9 'factors' were 1.82, 1.64, 1.27, 1.16, 1.08, 0.99, 0.90, 0.87, and 0.70). A single factor solution showed item loadings ranging from 0.50 to 0.79. The average communality was 0.73. The average item loading was .65. No items had a factor loading lower than 0.50.

Hierarchical regressions for HYPOTHESIS 2 (ICQ-EV will be associated with OC symptoms.)

Previous experiments (Hart, Bryer, & Martines, 1991; Todd, Deanne, & McKenna, 1997) demonstrated little differences between severity index scales of non-clinical versus clinical participants, whereas SCL-R-90 pathology subscales were better indicators of clinical severity. In addition and as mentioned earlier, the SCL-90-R's subscales are highly intercorrelated. Subsequently, a five step hierarchical

regression was conducted with the ICQ-EV total scores as the dependent variable. The OC subscale was entered at step one of the regression as it is the primary domain which relates to OC symptoms. At step two, the DEP and ANX subscales were entered as they are domains closely associated with OC symptoms. The PAR, PSY, and PHOB subscales were entered at step three. At step four, the SOM, IS, and HOS subscales. Finally, the GSI, PSDI, and PST subscales were entered at step five. The PAR, PSY, and PHOB subscales were entered in this order as it seemed plausible that these domains are linked to OC symptoms as well, whereas the SOM, IS, and HOS subscales seemed to be less connected to OC symptoms. See Table 2.4 for regression statistics.

The hierarchical regression revealed that at step one, the OC subscale contributed significantly to the regression model, ($R^2 = 0.29$, $F(1,92) = 38.02$, $p < .001$) and accounted for 29.2% of the variance in the ICQ-EV scores. Introducing the DEP and ANX subscales at step two explained an additional 6.5% of the variation in the ICQ-EV and this change in R^2 was significant ($R^2 = 0.36$, $F(1,90) = 4.55$, $p < .05$). Adding the PAR, PSY, and PHOB subscales to the regression model at step three explained an additional 3.7% of the variation in the ICQ-EV scores, yet this change in R^2 was not significant, ($R^2 = 0.39$, $F(1,87) = 1.77$, n.s.). Then, adding the SOM, IS, and HOS subscales to the regression model at step four explained 0.6% of the variance in the ICQ-EV sores, and the change in R^2 was not significant, ($R^2 = 0.40$, $F(1,84) = 0.28$, n.s.). Finally, the addition of the three subscales of total average scores (GSI, PSDI, PST) to the regression model at the final step explained an additional 8.3% of the variation in the ICQ-EV scores and this change in R^2 square was significant ($R^2 = 0.48$, $F(1,81) = 4.31$, $p < .05$). The most important predictor of inferential confusion was the OC subscale which uniquely explained 29% of the variation in the ICQ-EV scores ($\beta = 0.54$, $p < .001$). Together the 12 independent variables accounted for 48.3% of the variance of the ICQ-EV scores.

Adults' results in literature versus the adolescents' sample

As mentioned earlier, mean scores on the ICQ-EV for adolescents (n = 98; M = 96.03; SD = 26.30) were more coherent compared to previous studies with adults (n = 360; M = 75.74, SD = 26.55) (see e.g., Aardema, et al, 2010 for all adults' results). Adults' results pertaining to the factor analysis of the ICQ-EV yielded a one factor solution (item/sample ratio = 3.1), while the adolescent sample also yielded a one-factor solution with an item/sample ratio of 3.7/1. The eigenvalue of the first factor for the adults' results was 15.9 explaining 49.6% of the variance, while for the adolescents' sample first factor eigenvalue was 11.2 and it accounted for 37.4% of the variance. The average communality was 0.51 for the adults' results, while the adolescents' sample was 0.71. Finally, the internal consistency for the adults' results for 30 items was 0.96, while it was 0.94 for the adolescents' sample.

DISCUSSION

The primary aim of this study was to explore the presence of inferential confusion in a medium-sized sample of non-clinical Quebecer adolescents (n=98). The findings indicated, through the completion of the ICQ-EV, that adolescents aged between 14 and 17 years reported the presence of inferential confusion in their reasoning, more so than non-clinical adults. Also, results demonstrated that the psychometric properties of the ICQ-EV for an adolescent sample were significant. The scale was found to have a clear-cut one factor structure. Furthermore, the reliability (internal consistency) coefficient of the ICQ-EV was significant (i.e., > 0.90). Therefore, inferential confusion is a cognitive process which is present even in adolescence.

Factor analysis of inferential confusion in adolescents yielded a clear-cut solution with a one factor of inferential confusion. This finding replicates previous findings for adults (see e.g., Aardema, et al, 2010). The reported incidence of inferential confusion in this study was relatively high in relation to comparable

studies with adult populations (adolescents $M = 96.03$ ($SD = 26.30$), versus adults $M = 71.12$ ($SD = 26.27$) (see for further adults results Aardema et al., 2010)). Due to the uniqueness of this project investigating inferential confusion in an adolescent population, there are no other studies to compare with these results. Nevertheless, it seems that other investigators looking at cognitive processes related to OCD in an adolescent population has encountered similar findings than ours. Well's metacognitive models and the cognitive appraisal model were both investigating adolescents and adults samples and also found that adolescent means tended to be relatively higher than adult's (Crye, Laskey, & Cartwright-Hatton, 2010; Libby, Reynolds, Derisley, & Clark, 2004). A possible theory for these findings pertains in adolescents' new and extensive use of their imagination, reasoning, and logistics in their current stage of development (Piaget, 1950). Such that, they are more likely to explore all possibilities in reasoning and interpretation, more so than adults, for any given situation as this process is still novel and evolving to them.

In terms of OC symptoms and cognitive process, it was hypothesized that the ICQ-EV would be associated with OC symptoms in an adolescent sample. Indeed, there was a strong and positive relationship between scores on the ICQ-EV and the SCL-90-R OC subscale. Furthermore, the OC subscale was the single most important indicator of inferential confusion in this study. These findings are in agreement with previous work involving adult samples. In fact, several studies have demonstrated the ICQ-EV's capacity to better differentiate OC symptoms in all adult samples compared to other psychometric measures (Aardema et al., 2010; Wu, Aardema, & O'Connor, 2009). In summary, these findings do provide some preliminary indication that inferential confusion may be important in the experience of reasoning and mental process in this age group.

If the experience of inferential confusion in non-clinical adolescents is similar to that in adults, it is possible that models used to understand these experiences in adults may also be appropriate to younger populations. These findings suggest that the inference-based model and therapy may be beneficial in the treatment of

adolescents with OCD. The clinical and research implications for these findings include adapting IBT for adolescents, early prevention and detection for OC symptomatology, and further developmental investigations aimed at exploring the emergence of OC cognitive processes.

Limitations

Three limitations of the current study should be acknowledged. First, the study relied on an analogue sample of normal adolescents displaying relatively low levels of OCD symptoms. Second, the sample size recruited for this study was not large. However, literature relating to the recommended sample size for the use of factor analyses varies greatly. Researchers (Hogarty et al., 2005; MacCallum et al., 1999) found that there is an important misconception concerning the minimum ratio of sample size to the number of variables, or the minimum sample size. In fact, it appears that the needed sample size depends on several characteristics of any given study, including the level of communality of the variables and the level of dimensions of the factors. According to researchers (Zhao, 2009; Hogarty et al., 2005; MacCallum et al., 1999), this investigation had an appropriate sample size since the ICQ-EV has been demonstrated as having a high average level of communality of variables (0.7) and a unidimensional structure (Aardema et al., 2010).

Finally, the third limitation is that the current study was correlational in nature and hence does not provide evidence for any kind of causal association between inferential confusion and psychopathology. Nevertheless, the data are supportive of the notion that inferential confusion is involved in a broad range of anxiety disorders and in particular OCD in an adolescent sample.

Conclusion

In conclusion, the pattern of inferential confusion in non-clinical adolescents seems to resemble findings as in adults. These findings support the notion that inferential confusion in non-clinical adolescents can be viewed as being on a continuum, which parallels the adult literature. The results of this study indicate that inferential confusion is related to OC symptoms in adolescents, as it is in adults.

Further investigation is needed in this area to expand on our knowledge in regards to the role of cognitive processes in OCD in adolescents, as well as to explore which and how cognitive processes are associated in the stages of development. Nevertheless, this study adds to the growing work suggesting that cognitive models of OCD may be suitable to adolescents.

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Table 2.1

Descriptive statistics for all measures completed

	N	Min	Max	Max possible	Range	Mean	Standard Deviation
ICQ-EV total	98	43	180	180	137	97.29	25.10
Girls	52	55	125	180	70	93.58	21.53
Boys	46	43	180	180	137	101.52	28.60
French	50	43	180	180	137	98.66	24.37
English	48	30	180	180	150	93.29	28.16
SCL-90-R OC	98	0	76	81	76	41.10	13.83
Girls	52	0	57	81	57	41.92	9.00
Boys	46	0	76	76	76	40.17	17.86
SCL-90-R DEP	98	0	54	81	54	35.10	13.93
Girls	52	0	54	81	54	37.85	10.73
Boys	46	0	54	76	54	31.93	16.44
SCL-90-R ANX	98	0	66	81	66	36.72	16.84
Girls	52	0	60	81	60	38.44	14.42
Boys	46	0	66	80	66	34.73	19.25
SCL-90-R PAR	98	0	63	78	63	39.64	20.45
Girls	52	0	58	75	58	41.08	18.57
Boys	46	0	63	78	63	37.98	22.55
SCL-90-R PSY	98	0	75	81	75	33.99	20.70
Girls	52	0	60	81	60	32.96	19.48
Boys	46	0	75	78	75	35.18	22.19
SCL-90-R PHOB	98	0	81	81	81	29.42	25.69
Girls	52	0	66	81	66	31.06	25.22
Boys	46	0	86	76	81	27.57	26.37
SCL-90-R SOM	98	0	63	81	63	47.45	12.53
Girls	52	0	63	81	63	50.35	10.55
Boys	46	0	63	78	63	44.11	13.86
SCL-90-R IS	98	0	62	73	62	40.57	15.43
Girls	52	0	62	56	62	43.98	11.46
Boys	46	0	60	73	60	36.62	18.38
SCL-90-R HOS	98	0	65	78	65	42.81	16.81
Girls	52	0	65	76	65	45.87	13.39
Boys	46	0	65	78	65	39.29	19.63
SCL-90-R GSI	98	0	61	79	61	40.56	10.26
Girls	52	0	58	79	58	41.35	9.55
Boys	46	0	61	78	61	39.64	11.08

Table 2.2

Participants' characteristics

	Raw score (SD)	T-score (SD)	Percentile
SCL OC subscale			
Female	0.76 (0.50)	41.92 (9.00)	22%
Male	0.95 (0.82)	40.17 (17.86)	16%
SCL DEP subscale			
Female	0.69 (0.49)	37.85 (10.73)	11%
Male	0.62 (0.77)	31.93 (16.44)	4%
SCL ANX subscale			
Female	0.64 (0.54)	38.44 (14.42)	11%
Male	0.72 (0.88)	34.73 (19.25)	7%
SCL PAR subscale			
Female	0.72 (0.59)	41.08 (18.57)	19%
Male	0.84 (0.84)	37.98 (22.54)	9%
SCL PSY subscale			
Female	0.38 (0.40)	32.96 (19.48)	5%
Male	0.60 (0.43)	35.18 (22.19)	7%
SCL PHOB subscale			
Female	0.64 (0.54)	31.06 (25.22)	11%
Male	0.72 (0.88)	27.57 (26.37)	7%

Table 2 (continued)

Participants' characteristics

	Raw score (SD)	T-score (SD)	Percentile
SCL SOM subscale			
Female	0.75 (0.48)	50.35 (10.55)	50%
Male	0.55 (0.64)	44.11 (13.86)	28%
SCL IS subscale			
Female	0.98 (0.66)	43.98 (11.46)	28%
Male	0.77 (0.79)	36.62 (18.38	9%
SCL HOS subscale			
Female	0.78 (0.58)	45.87 (13.39)	34%
Male	0.71 (0.79)	39.29 (19.63)	13%
SCL GSI subscale			
Female	0.67 (0.42)	41.35 (9.54)	19%
Male	0.68 (0.72)	39.64 (11.08)	16%

Table 2.3

Correlations for the ICQ-EV and the SCL-90-R subscales

	ICQOC	DEP	ANX	PAR	PSY	PHOB	PHO	IS	HOS	GSI	PSDI	PST
ICQ-EV	.434**	.546**	.487**	.339**	.459**	.496**	.324**	.545**	.513**	.595**	.417**	.484**
OC		.645**	.548**	.703**	.700**	.646**	.532**	.634**	.618**	.803**	.320**	.791**
DEP			.842**	.733**	.628**	.778**	.630**	.762**	.664**	.838**	.545**	.788**
ANX				.756**	.654**	.755**	.599**	.770**	.619**	.800**	.453**	.775**
PAR					.713**	.631**	.665**	.680**	.664**	.809**	.396**	.793**
PSY			.			.575**	.601**	.653**	.684**	.776**	.342**	.763**
PHOB							.499**	.738**	.652**	.741**	.327**	.711**
SOM								.616**	.562**	.714**	.533**	.703**
IS									.744**	.756**	.382**	.747**
HOS										.757**	.371**	.727**
GSI											.673**	.924**
PSDI												.373**
PST										.		

Note. Correlation is significant at the 0.01 level (2-tailed).

Table 4

Summary of Hierarchical Regression Analysis for ICQ-EV and SCL-90-R subscales

Variables	B	SE B	β	*t*	sr^2	*R*	R^2	ΔR^2
Step 1						0.54	0.29	0.29
OC	1.09	0.18	0.54	6.17***	0.29			
Step 2						0.60	0.36	0.07
DEP	-0.64	0.24	-0.34	-2.62**	0.05			
ANX	0.45	0.18	0.30	2.57*	0.05			
Step 3						0.63	0.39	0.04
PAR	0.27	0.18	0.22	1.51	0.02			
PSY	0.17	0.16	0.14	1.03	0.01			
PHOB	-0.03	0.12	-0.03	-0.26	0.05			
Step 4						0.63	0.40	0.01
SOM	0.27	0.32	0.12	0.85	0.01			
IS	0.19	0.32	0.11	0.61	0.00			
HOS	-0.09	0.22	-0.06	-0.39	0.00			
Step 5						0.70	0.48	0.08
GSI	-0.52	1.94	-0.18	-0.27	0.01			
PSDI	1.07	0.80	0.34	1.34	0.01			
PST	1.44	0.90	0.65	1.60	0.02			

Note. $N = 94$; *$p < .05$, **$p < .01$, ***$p < .001$

CHAPTER 3
GENERAL DISCUSSION

GENERAL DISCUSSION

This last chapter is a general discussion of this doctoral essay. A summary of its contents and its main results will first be recapped. This will include a review of the exploratory results investigating the presence of inferential confusion in an adolescent sample. Limitations of the IBA model in general will then be discussed. Finally, suggestions for future research and a general conclusion will end the chapter.

3.1 Summary and review

As discussed in the first section, CBT with the use of exposure response prevention (ERP) is currently the psychological treatment of choice for OCD, especially with children and adolescents. Despite positive outcomes, this treatment approach is associated with certain difficulties. Mainly, it presents particularly significant dropout rate and refusal to take part in exposure to feared stimulus. Subsequently, some CBT approaches (CAM, meta-cognitive model, and now IBA) have decided to further explore treatment options for OCD without the use of ERP.

This body of work aimed to increase our understanding and knowledge of OCD. Established, as well as new factors were examined to expand on previous findings for an inference-based approach. It was hypothesised that the experience of inferential confusion in non-clinical adolescents was similar to that in adults. The results in the second section demonstrated the presence of inferential confusion in an adolescent sample, and its continuous relationship with OC symptoms. Consequently, it is possible that models used to understand these experiences in adults may also be applicable to adolescents. These findings suggest that an inference-based approach and therapy may be useful in the treatment of adolescents with OCD. This study has generated examples of inferential confusion reported by adolescents that might provide a useful treatment resource for normalizing purposes.

The pattern of 'universal inferential confusion" (i.e. doubt reasoning process) in non-clinical adolescents seems to closely resemble that found in adults. These findings support the idea that inferential confusion in non-clinical adolescents can be viewed as being on a continuum, which parallels the adult literature, as well as several other cognitive processes related to OCD. Furthermore, the results of the second section highlight the presence and importance of doubt in the reasoning process in adolescents, as it is in adults. Further research is needed in this area to examine the role of cognitive processes in OCD in adolescents. However, this study adds to the growing literature suggesting that cognitive models of OCD may be applicable to adolescents.

3.2 Limitations of the Inference-Based Approach

Several limitations to the inference-based approach must be named. First, additional independent reproduction of the model and of its therapeutic application in diverse populations is essential. Also, the application of the inference-based approach to clinical disorders other than OCD requires further development. In the same way, it remains ambiguous whether or not this approach is suitable for children, or for individuals with developmental delays. Thus far, O'Connor and his colleagues have extended an IBA treatment protocol for eating disorders, delusional disorder, and for body dysmorphic disorder, but employment of an IBA model has yet to expand to other clinical problems. The successful practice of this approach to varied populations and clinical disorders would further validate the efficacy of the model. A final limitation to the inference-based model is that, although it seems to be fairly well integrated by clients (O'Connor, Aardema, Koszegi, & Delormes, in preparation), distribution of IBA treatment protocols to therapists presents a challenge. The inference-based approach is complex and requires a considerable understanding of reasoning processes. However, despite this drawback, IBA appears to have the potential to generate significant improvement in OCD clients, a result that will no

doubt motivate clinicians to assimilate inference-based approaches into their treatment plan.

3.3 Clinical implications, future directions, and conclusion

Despite the limitations mentioned above, this doctoral essay has important strengths. Mainly, it is the first to explore the presence of inferential confusion in an adolescent population. In return, this opens the door for further exploration and development of cognitive models of OCD, more specifically an IBA of OCD.

In terms of clinical implications, the study relates the importance of evaluating the working processes of reasoning and obsessive doubts involved in adolescents with OCD. Followed by the development and implementation of an IBT protocol aimed specifically at adolescents with OCD. In fact, several therapy-oriented investigations are in progress at the Fernand-Seguin Research Centre (FSRC) in Montreal, Quebec. O'Connor and colleagues are hoping to illustrate, by overseeing IBT protocol experiments, that other disorders differentiated by doubt and intrusive thoughts can be supported through an inference-based approach, and similarly, can be treated with IBT. This was recently illustrated through research evaluating and treating body dysmorphic disorder (Taillon, O'Connor, Dupuis, & Lavoie, 2013). Furthermore, O'Connor (O'Connor et al., in preparation) plans to provide further empirical evidence for respective cognitive-based therapies, and advance knowledge about treatment applications for OCD by comparing treatment effects of CBT with that of IBT.

In sum, theoretically and practically, both IBA and CAM are compatible with one another. They focus on and treat different phases in the obsessional cognitive process (Clark & O'Connor, 2004). Future research should not emphasise on maintaining or discarding one or another model. Instead, each model should focus on

further developing and explaining cognitive processes, unique to them, in the development of OCD.

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Appendix A.

Ethical Approval

Centre de recherche
Fernand-Seguin
de l'Hôpital
Louis-H. Lafontaine

Animés par l'espoir

Le 25 mars 2011

Docteur Kieron O'Connor **PAR COURRIEL**
Centre de recherche Fernand-Seguin

Objet : Projet 2011-010 – Inférences et obsessions : Exploration des cognitions chez les adolescents dans une population non-clinique.

Docteur O'Connor,

Le comité d'éthique de la recherche de l'Hôpital Louis-H. Lafontaine a évalué, le 23 mars 2011, les documents suivants :

- Le protocole de recherche amendé, non daté ;
- Le questionnaire justifiant les aspects éthiques du projet de recherche ;
- Annexe A : Annonce du projet de recherche ;
- Annexe B : Autorisation des parents à la participation au projet de recherche ;
- Annexe C : Formulaires d'information et de consentement en français et en anglais, datés du 10 mars 2011 ;

- Annexe D : Questionnaire déjà approuvé par le CÉR

Concernant le formulaire d'information et de consentement :

Le CÉR demande à la chercheure d'harmoniser les contenus des versions française et anglaise du formulaire de consentement.

Concernant l'annonce de recrutement :

Le CÉR demande de revoir l'annonce à l'intention des étudiants de façon à mettre l'accent davantage sur la recherche elle-même plutôt que sur le cadeau offert pour les participants à la recherche.

Me Odette Beaudoin, présidente intérimaire, est autorisée à approuver définitivement le projet principal, en accéléré, après s'être assurée de l'approbation du projet par le Comité d'évaluation scientifique et de la conformité des modifications demandées par le CÉR.

À des fins administratives, nous vous demandons de bien vouloir mentionner, dans votre correspondance, le numéro attribué à votre demande par notre institution.

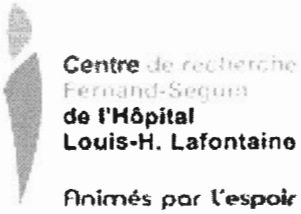
Espérant le tout à votre entière satisfaction, je vous prie d'agréer, Docteur O'Connor, mes salutations distinguées.

O. Beaudoin

Me Odette Beaudoin, présidente intérimaire
Comité d'éthique de la recherche
/kl

Appendix B

Letters to parents



UQÀM

DATE...

Madame, monsieur,

L'école secondaire Sophie-Barat souhaite évaluer le bien-être psychologique de ses jeunes afin de prévoir des mesures d'aide et d'intervention pour les élèves qui en auraient besoin.

Nous voulons vous informer que nous solliciterons la participation de votre enfant afin qu'il puisse compléter un sondage. Deux questionnaires seront distribués. Le premier est une échelle de mesure de manifestations de bien-être physique et psychologique (SCL-90) et le deuxième évalue le lien entre les pensées et la détresse psychologique (ICQ-EV).

- Les élèves compléteront le sondage le ***DATE.***
- Cela leur prendra environ de ***25 à 30 minutes***, lors de leur cours de NOM DU COURS.
- Tous les questionnaires seront complétés de façon **anonyme**; les résultats serviront à mieux connaître les aspects de la santé psychologique des jeunes et seuls les professionnels de l'école vont avoir accès aux résultats du sondage.

Si vous avez des questions concernant ce sondage, veuillez communiquer avec ***Lucien Turbis, Adjoint 3e et 4e secteur régulier / CPF***.

Nous vous remercions de votre collaboration,

_____

Lucien Turbis, Adjoint 3e et 4e secteur régulier / CPF

J'accepte que mon enfant participe à ce sondage

_____ _____

Signature Date

Centre de recherche
Fernand-Seguin
de l'Hôpital
Louis-H. Lafontaine

Animés par l'espoir

UQÀM

Hôpital
Louis-H. Lafontaine

Animés par l'espoir

DATE...

Dear parents,

Lauren Hill Academy wishes to evaluate the psychological welfare of its students in order to provide adequate resources and interventions for those who need it.

We would like to notify you that we will be soliciting your child to take part in a survey. The questionnaires included in the survey have been designed to be used in such instances, and are reliable measures. Two questionnaires will be distributed during this survey. The first questionnaire is a scale aimed to evaluate physical and psychological manifestations (SCL-90), while the second questionnaire aims to investigate the link between thoughts and psychological distress (ICQ-EV).

- The students will complete the survey on ***DATE.***
- The survey takes approximately ***25 to 30 minutes*** to complete. It will be completed during their NOM DU COURS class.
- All questionnaires will be completed anonymously; the results aim to provide further information concerning the mental health of the school's youth. Subsequently, only professional members at the school will have access to the results.

For more information or questions concerning the survey, please contact ***Pelagia Nickoletopoulos, acting principal***.

We thank you for your collaboration,

_____

Pelagia Nickoletopoulos, acting principal

I authorise my child to partake in the survey.

_____ _____

Signature Date

Appendix C

Consent Forms

Centre de recherche
Fernand-Seguin
de l'Hôpital
Louis-H. Lafontaine

Animés par l'espoir

Hôpital
Louis-H. Lafontaine

Animés par l'espoir

FORMULAIRE DE D'INFORMATION ET DE CONSENTEMENT

Inférences et obsessions: Explorer les cognitions chez les adolescents dans une population non-clinique

Chercheurs responsables : Kieron O'Connor, PhD, chercheur et psychologue, CRFS
Monique Lahoud, candidate au Psy.D, UQAM, CRFS

Organisme subventionnaire : Fonds de la recherche en santé du Québec (FRSQ)

Il est important de bien lire et comprendre le présent formulaire d'information et de consentement pour la recherche à laquelle nous vous demandons de participer. Prenez le temps nécessaire pour lire et comprendre tous les renseignements liés à cette recherche. Nous vous invitons à poser toutes les questions que vous jugerez utile au chercheur responsable ou aux membres de son équipe.

Description du projet de recherche

L'étude porte sur la relation entre les croyances et les pensées liées à l'anxiété. Des données seront recueillies via la complétion de questionnaires mesurant des processus cognitifs et des aspects liés à l'anxiété. L'expérimentation sera d'une durée d'environ 25 à 30 minutes et se fera en ligne sur un ordinateur à l'aide du programme « Survey Monkey ».

Nature de la participation

Votre participation à cette étude implique la complétion de plusieurs questionnaires, d'une durée d'environ 25 à 30 minutes, sur les processus de la pensée et l'anxiété.

Inconvénients pouvant découler de votre participation à ce projet

Il n'y a aucun risque physique relié à votre participation.

Avantages pouvant découler de votre participation au projet de recherche

Bien que vous ne retiriez aucun avantage direct de votre part, les données recueillies permettront de faire avancer la compréhension des mécanismes de la pensée chez les adolescents et de développer des alternatives de traitement pour les obsessions chez une population adolescente.

Indemnité compensatoire

Les participants recevront une compensation de 10 en chèque-cadeau pour leur participation à ce projet.

Liberté de participation et de retrait

Votre participation à ce projet de recherche est tout à fait 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 et sans aucune conséquence négative.

Confidentialité

Les résultats aux questionnaires recueillis dans le cadre du projet de recherche décrit ci-dessus seront traités de manière tout à fait anonyme et codifiée par numéro. Les documents papiers seront classés dans une filière sous clé et les données informatisées seront intégrées à une base de données avec un mot de passe dont seuls les membres de l'équipe connaissent. Il est entendu que les résultats de la présente étude pourront servir à des fins de publication scientifique tout en respectant les règles de confidentialité. Les données du projet de recherche seront conservées pour une période de 7 ans suivant la fin de l'étude, après quoi elles seront détruites.

Financement du projet de recherche

Le chercheur a reçu des fonds de l'organisme des Fonds de la recherche en santé du Québec (FRSQ) pour mener à bien ce projet de recherche

Contacts

Si vous avez des questions concernant le projet de recherche ou si vous croyez que vous éprouvez un problème relié à votre participation au projet de recherche, vous pouvez communiquez avec le chercheur responsable du projet de recherche (Kieron O'Connor) au numéro suivant 514-251-4015, poste 2343 ou avec l'étudiante doctorale responsable su projet (Monique Lahoud) au poste 3423.

Pour toutes questions sur vos droits à titre de participant à une recherche ou pour tout problème éthique concernant les conditions dans lesquelles se déroule votre participation à ce projet, vous pouvez contacter :

La Commissaire local aux plaintes
Hôpital Louis-H. Lafontaine, 7401, rue Hochelaga
Montréal, QC H1N 3M5
Téléphone : 514-251-4000, poste 2920.

Le comité d'éthique de la recherche du Centre de recherche Fernand- Seguin a approuvé ce projet de recherche et en assure le suivi. De plus, il approuvera au préalable toute révision et toute modification apportée au formulaire d'information et de consentement et au protocole de recherche.

Coordonnées du comité :

Comité d'éthique de la recherche
Centre Fernand-Seguin de l'Hôpital Louis-H. Lafontaine
7331, rue Hochelaga
Montréal (Québec) H1N 3V2
Tél. : 514-251-4015 poste 3591

Hôpital
Louis-H. Lafontaine
Animés par l'espoir

Signature du participant

Je déclare avoir lu le présent formulaire d'information et de consentement. Je consens librement et volontairement à participer à ce projet.

Nom du participant (lettres moulée) Signature du participant

Date

Signature de l'expérimentateur

Je certifie que j'ai expliqué au participant de recherche les termes du présent formulaire d'information et de consentement, que j'ai répondu aux questions que le participant avait à cet égard et que j'ai clairement indiqué qu'il demeure libre de mettre un terme à sa participation, et ce, oralement ou par écrit, sans préjudice.

Nom de l'expérimentateur (lettres moulée) Signature de l'expérimentateur

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Date

Centre de recherche
Fernand-Seguin
de l'Hôpital
Louis-H. Lafontaine

Animés par l'espoir

INFORMATION AND CONSENT FORM

Inferences and obsessions: Cognitions in non-clinical adolescents

Principal Researchers: Kieron O'Connor, PhD, researcher and psychologist, CRFS
Monique Lahoud, Psy.D candidate, UQAM, CRFS

Funding Agency: Fonds de la recherche en santé du Québec (FRSQ)

It is important to properly read and understand the following consent form of the study you are about to partake in. Please take all the necessary time needed to read carefully and fully understand all of the information pertaining to this study. We invite you to ask all and any questions that you might have about the study to the principal researchers, or to a member of their team.

Description of the research project

The purpose of the research is to examine the relationship between thoughts relating to different aspects of anxiety. The results will be collected with the help of questionnaires designed to measure cognitive processes which are related to anxiety. In total, the experiment will take approximately 25-30 minutes to complete. It will be completed on a computer and online with the help of the "Survey Monkey" program.

Nature of your participation

Your participation to this study, which can take from 25 to 30 minutes, includes the completion of two questionnaires about cognitive processes and how they relate to anxiety.

Discomforts that may result from your participation

There are no physical discomforts that will result from your participation.

Advantages that may result from your participation

Although there are no direct advantages to participate, the results obtained for this research will allow furthering the knowledge and understanding about mechanisms that may affect treatment of obsessions, as well as to develop alternative treatment methods for this population.

Compensation

Participants will receive a 10 gift certificate as compensation for their participation in this research project.

Right to withdraw participation

Participation in this study is voluntary; therefore, the participant is free to withdraw their consent and discontinue their participation in this study at any time, without any negative consequences.

Confidentiality

All of the information obtained will be kept strictly anonymous and will be stored under lock and key for a period of seven years, at which point it will be shredded. Access to this information will be made available only to members of the research team. Confidentiality is ensured as all data will be coded by number only. The data will be kept in a locked room

reserved for this purpose only. The data from this study may be published, but no identifying information will be released.

Funding for this research project

The principal investigator of this research project has received funding for this study from the *Fonds de la recherche en santé du Québec* (FRSQ).

Contacts

If you have any questions concerning this study or if you encounter any difficulties during your participation, please feel free to ask the principal investigator of the research project (Kieron O'Connor) at the following number 514-251-4015, extension 2343, or the graduate student responsible for this research project (Monique Lahoud) at extension 3423.

For all questions concerning you rights as a research participant or for any ethical concerns about your participation in this project, contact:

Complaints and Quality of Services Commissioner
Louis-H. Lafontaine Hospital
7401, rue Hochelaga, Bedard Pavillon, 2nd floor, room BE-2148
Montréal, QC H1N 3M5
Telephone : 514-251-4000, extension 2920
Fax : 514-251-2954

The Fernand-Seguin Research Centre's ethical committee has approved this research project and ensured its continuation. Furthermore, all future revision and modifications to this consent form and research protocol must also be approved by the committee. For more information, contact:

Research Ethics Committee
Louis-H. Lafontaine Hospital

7401, rue Hochelaga,
Montréal, QC H1N 3M5
Telephone : 514-251-4000, extension 2442
Fax : 514-251-2964
Participant's signature

I declare that I have carefully studied the above and understand this agreement. I freely consent and voluntarily agree to participate in this study.

Participant's name Participant's Signature

Date

Experimenter's signature

I declare that i fully and clearly explained to the participant all of terms of the following consent form of research, that i have answered all of the questions that were asked by the participant, and i clearly stated that the participant was free to withdraw from the study at any point without any negative consequences.

Experimenter's name Signature

Date

Appendix D

Questionnaire samples

QPI-EV

Questionnaire sur les processus inférenciels (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**

	Répondez (1 to 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.	

Inferential Confusion Questionnaire – Expanded Version (ICQ-EV)

Please rate your agreement or disagreement with the following statements using this scale:

Scale: 1 2 3 4 5 6

Strongly disagree **Disagree** **Somewhat disagree** **Somewhat agree** **Agree** **Strongly agree**

	Answer (1 to 6)
1. I am sometimes more convinced about what might be there than by what I actually see.	
2. I sometimes invent stories about certain problems that might be there without paying attention to what I actually see.	
3. Sometimes certain far-fetched ideas feel so real they could just as well be happening.	
4. Often my mind starts to race and I come up with all kinds of far-fetched ideas.	
5. I can get very easily absorbed in remote possibilities that feel as if they are real.	
6. I often confuse different events as if they were the same.	
7. I often connect ideas or events in my mind that would seem far-fetched to others or even to me.	

SCL-90-R

Below is a list of problems people sometimes have. Please read each one carefully, and select the number that best describes how much that problem has distressed or bothered you during the past 7 days including today. Select only one number for each problem and do not skip any items.

	Not at all	A little bit	Moderately	Quite a bit	Extremely	HOW MUCH WERE YOU DISTRESSED BY:
1	0	1	2	3	4	Headaches
2	0	1	2	3	4	Nervousness or shakiness inside
3	0	1	2	3	4	Repeated unpleasant thoughts that won't leave your mind
4	0	1	2	3	4	Faintness or dizziness
5	0	1	2	3	4	Loss of sexual interest or pleasure
6	0	1	2	3	4	Feeling critical of others
7	0	1	2	3	4	The idea that someone else can control your thoughts
8	0	1	2	3	4	Feeling others are to blame for most of your troubles
9	0	1	2	3	4	Trouble remembering things
10	0	1	2	3	4	Worried about sloppiness or carelessness
11	0	1	2	3	4	Feeling easily annoyed or irritated
12	0	1	2	3	4	Pains in heart or chest
13	0	1	2	3	4	Feeling afraid in open spaces or on the streets
14	0	1	2	3	4	Feeling low in energy or slowed down
15	0	1	2	3	4	Thoughts of ending your life
16	0	1	2	3	4	Hearing voices that other people do not hear
17	0	1	2	3	4	Trembling
18	0	1	2	3	4	Feeling that most people cannot be trusted
19	0	1	2	3	4	Poor appetite
20	0	1	2	3	4	Crying easily
21	0	1	2	3	4	Feeling shy or uneasy with the opposite sex
22	0	1	2	3	4	Feelings of being trapped or caught

SCL-90-R

Nom : _____

Date : _____

Voici une liste de problèmes dont se plaignent parfois les gens. Lisez attentivement chaque énoncé et indiquez, à l'aide du chiffre qui décrit le mieux ce que vous vivez, jusqu'à quel point vous avez été incommodé(e) par ce problème au cours des sept derniers jours. Encerclez le chiffre approprié.

		Pas du tout	**Un peu**	**Passablement**	**Beaucoup**	**Extrêmement**
1	Maux de tête	0	1	2	3	4
2	Nervosité et tremblements intérieurs	0	1	2	3	4
3	Pensées désagréables répétitives	0	1	2	3	4
4	Faiblesses ou étourdissements	0	1	2	3	4
5	Diminution de l'intérêt sexuel	0	1	2	3	4
6	Envie de critiquer les autres	0	1	2	3	4
7	L'idée que quelqu'un peut contrôler vos pensées	0	1	2	3	4
8	L'impression que les autres sont responsables de vos problèmes	0	1	2	3	4
9	Difficulté à vous souvenir de certaines choses	0	1	2	3	4