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JOSÉE RHÉAUME

LES VARIABLES COGNITIVES ASSOCIÉES AU TROUBLE
OBSSSIONNEL-COMPULSIF

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RÉSUMÉ

Malgré le fait que les traitements basés sur l'exposition et la prévention de réponse ont clairement démontré leur efficacité avec le Trouble Obsessionnel-Compulsif (TOC), les résultats cliniques avec cette combinaison sont loin d'être optimaux. La thérapie cognitive pour le TOC est prometteuse. Les quatre études présentées ici ont pour but d'approfondir la compréhension des variables cognitives associées au TOC. La première étude appuie empiriquement le lien entre la surestimation du danger, la responsabilité et le perfectionnisme et les symptômes obsessionnels-compulsifs (OC). La deuxième étude démontre que la correction des croyances idéographiques sans aucune forme d'exposition ou de prévention de réponse représente un traitement efficace avec les vérificateurs compulsifs. La troisième étude suggère qu'au moins un des mécanismes impliqués dans le traitement cognitif et le traitement comportemental impliqueraient la précedence d'un changement cognitif sur la diminution de symptômes. Utilisant la même méthodologie, la quatrième étude démontre les liens bidirectionnels entre les états émotionnels indépendants, les cognitions et les symptômes. De plus, cette étude suggère que le processus de changement entre ces trois variables pourrait être différent chez les patients qui répondent bien ou non au traitement. Ces quatre études fournissent un appui empirique aux modèles théoriques formulés pour expliquer le TOC. Elles comportent également des implications cliniques considérables.

Josée Rhéaume, M.Ps.

Étudiante au doctorat

Robert Ladouceur, Ph.D.

Directeur de recherche

RÉSUMÉ

Malgré le fait que les traitements basés sur l'exposition et la prévention de réponse ont clairement démontré leur efficacité avec le Trouble Obsessionnel-Compulsif (TOC), les résultats cliniques avec cette combinaison sont loin d'être optimaux. Les récents modèles cognitifs et les derniers essais de thérapie cognitive ont démontré que la thérapie cognitive pour le TOC est prometteuse. Les quatre études présentées ici ont pour but d'approfondir la compréhension des variables cognitives associées au TOC. La première étude vérifie la contribution relative de la perception de danger, de la responsabilité et du perfectionnisme dans la prédiction des symptômes obsessionnels-compulsifs (OC) dans un échantillon de volontaires sains. Les résultats démontrent que les trois variables sont toutes modérément reliées aux symptômes OC. De plus, les croyances sur la responsabilité et le perfectionnisme sont des prédicteurs équivalents. Cette étude justifie empiriquement l'utilisation de la correction cognitive sur ces trois variables dans le traitement des symptômes OC. La deuxième étude teste l'efficacité d'une intervention cognitive portant sur ces trois variables avec des patients souffrant de compulsions de vérification et la compare à un traitement d'exposition et de prévention de réponse. Les deux traitements démontrent des résultats cliniquement et statistiquement significatifs au post-test. Les résultats montrent que la correction des croyances idéographiques sans aucune forme d'exposition ou de prévention de réponse représente un traitement efficace avec les vérificateurs compulsifs. Le but de la troisième étude est d'explorer les changements cognitifs individuels durant le traitement cognitif et le traitement comportemental des compulsions de vérification. L'analyse de Séries Chronologiques démontre que pour 2/3 des patients ayant reçu la thérapie cognitive, et pour les trois patients ayant reçu le traitement comportemental, le changement sur au moins une variable

cognitive précède le changement des symptômes de vérifications. Ceci suggère qu'au moins un des mécanismes impliqués dans le traitement cognitif et le traitement comportemental impliquerait la précédence d'un changement cognitif sur la diminution de symptômes. Cette étude est la première à démontrer qu'un changement de croyance spécifique précède la diminution des symptômes au cours du traitement avec cette population. Utilisant la même méthodologie, la quatrième étude explore les liens temporels entre l'état émotionnel, les obsessions et les cognitions durant le traitement cognitif-comportemental de cinq patients souffrant de TOC. Les résultats démontrent que pour 3/5 des patients, le changement dans l'état émotionnel précède la diminution des obsessions et que pour 2 des 5 patients, le changement dans l'état émotionnel précède le changement de croyance. Par contre, seulement pour les trois patients qui sont cliniquement rétablis, la diminution des obsessions précède le changement dans l'état émotionnel et des croyances. Cette étude donne un appui partiel à l'hypothèse postulant une influence des états émotionnels indépendants sur le TOC. De plus, elle suggère que les processus de changement entre l'état émotionnel, les cognitions et les symptômes pourraient être différents entre les patients qui répondent bien ou non au traitement. Ces quatre études fournissent un appui empirique aux modèles théoriques formulés pour expliquer le TOC. Elles comportent également des implications cliniques considérables.

Josée Rhéaume, M.Ps.
Étudiante au doctorat

Robert Ladouceur, Ph.D.
Directeur de recherche

ABSTRACT

Although treatment based on exposure and response prevention has clearly shown its effectiveness with Obsessive-Compulsive Disorder (OCD), clinical results with this combination are less than optimal. Recent cognitive models and the latest trials of cognitive therapy have shown that cognitive therapy for OCD is promising. The four studies presented here aim to give a better understanding of the cognitive variables associated with OCD. The first study tests the relative contribution of Perceived Danger, Responsibility and Perfectionism in the prediction of Obsessive-Compulsive (OC) symptoms in a nonclinical sample. Results show that the three variables are all moderately related to OC symptoms. Moreover, Beliefs about Responsibility and Perfectionism are equivalent predictors. This study gives empirical support for the use of cognitive correction of these three specific variables in the treatment of OC symptoms. The second study tests the effectiveness of cognitive therapy targeting these specific cognitive variables with six patients suffering from compulsive checking, and compares this treatment to exposure and response prevention. Both treatments demonstrate clinically and statistically significant changes for all patients at post-test. Results show that correction of idiographic beliefs, without any exposure nor response prevention instructions, is an effective treatment for OC checkers. The goal of the third study is to explore individual cognitive change during both successful cognitive therapy and behavioral treatment of compulsive checking. Multivariate Time Series analyses show that for 2/3 of patients in cognitive therapy and all 3 patients in the exposure treatment, change on at least one cognitive variable precedes the decrease of checking interference. This suggests that at least one mechanism involved during both cognitive and exposure therapy would imply the precedence of cognitive change over symptom change. This study is the first to

demonstrate that distinct specific changes in beliefs precede the decrease of symptoms during treatment with this population. Using the same methodology, the fourth study explores the temporal link between mood, obsessions and cognitions during cognitive-behavioral treatment of five patients suffering from OCD. Results show that for 3/5 of patients, Mood change precedes Obsessions change, and for only 2/5 of patients, Mood change precedes Beliefs change. However, only for the 3 patients who are clinically improved, the decrease in Obsessions precedes the decrease in Mood and Beliefs. This study gives partial support for the influence of independent mood states on OCD. Moreover, this study suggests that the process of change between mood, cognitions and symptoms may differ between treatment responders and nonresponders. These four studies provide empirical support for theoretical models of OCD. They also have considerable clinical implications.

TABLE DES MATIÈRES

Avant propos	II
Résumé (court)	IV
Résumé (long)	V
Abstract.....	VII
Table des matières	IX
Liste des tableaux.....	X
Chapitre 1 Introduction générale	1
Chapitre 2 La prédiction des symptômes obsessionnels-compulsifs: Des facteurs cognitifs multiples de vulnérabilité.....	9
Chapitre 3 Le traitement cognitif et le traitement comportemental du Trouble Obsessionnel-Compulsif Première partie. Un examen de leur efficacité relative.....	39
Deuxième partie. Un examen du changement cognitif individuel.....	95
Chapitre 4 Les changements dans l'état émotionnel, les symptômes et les croyances durant le traitement cognitif- comportemental du Trouble Obsessionnel-Compulsif.....	127
Chapitre 5 Conclusion générale	169
Liste des ouvrages cités	176

Liste des tableaux

Table 1:	Matrix of Correlations between Beliefs about responsibility, Perceived Responsibility, Perceived Danger, Perfectionism, and Obsessive-Compulsive symptoms.....	35
Table 2:	Correlations between Perceived Danger, Responsibility, Perfectionism, and the Padua Inventory subscales.....	36
Table 3:	Hierarchical Regression for Perceived Danger, Responsibility, and Perfectionism.....	37
Figure 1:	Self-rating of Checking interference for each patient.....	85
Table 1:	ADIS-III-R severity scores, comorbidity, and duration of illness for patients from both conditions.....	87
Table 2:	Results of Time-Series Analysis on Interference caused by checking.....	88
Table 3:	Individual scores on the measures of OC symptoms before treatment, after treatment, at six month follow up, and clinical significance.....	89
Table 4:	Individual scores on the measures of general functioning before treatment, after treatment, at six month follow up, and clinical significance.....	90
Table 5:	Individual scores on the process measures before treatment, after treatment, at six month follow up, and clinical significance.....	91
Table 6:	Endstate functioning on the obsessive compulsive measures.....	92
Table 7:	Treatment credibility and expectancies for improvement.....	94

Figure 1: Series of beliefs and checking interference..... 121

Figure 2: Summary of precedence testing..... 123

Table 1: Summary of the ARMA models,
with diagnostic indices of model adequacy..... 124

Table 2: Precedence tests between the strength in beliefs and
interference caused by checking..... 125

Figure 1: Self-rating of obsessions, mood states, and beliefs..... 160

Figure 2: Summary of precedence testing..... 162

Table 1: ADIS-III-R severity scores, comorbidity, and duration
of illness for the 5 patients 163

Table 2: Individual scores on the measures of OC symptoms
before treatment, after treatment, at six month
follow up, and clinical significance..... 164

Table 3: Individual scores on the general functioning measures
before treatment, after treatment, at six month
follow up, and clinical significance..... 165

Table 4: ARMA models with diagnostic indices
of model adequacy..... 166

Table 5: Precedence tests between Mood State, Obsessions, and
Beliefs..... 167

CHAPITRE 1

INTRODUCTION GÉNÉRALE

Le Trouble Obsessionnel-Compulsif se définit par la présence d'obsessions ou de compulsions. Les obsessions sont des pensées, des images ou des impulsions intrusives et difficiles à chasser, créant de la détresse chez l'individu (APA; DSM-IV, 1994). Les thèmes des obsessions représentent généralement (mais pas obligatoirement) des idées qui sont égodystones, c'est-à-dire contraires au système de valeurs et de croyances de l'individu. Les plus fréquents font référence à l'agressivité, la perte de contrôle, la sexualité, la religion, la contamination et la maladie (e. g., Rasmussen & Eisen, 1992). Les compulsions sont des actions répétitives qui visent à chasser les obsessions, les régler ou réduire l'inconfort qui en résulte (APA; DSM-IV, 1994). Les formes les plus connues regroupent les compulsions de vérification, d'ordre et de nettoyage.

Les études épidémiologiques suggèrent que la prévalence du TOC se situe entre 2 et 3%, ce qui est 50 fois plus grand que ce qui avait été rapporté antérieurement (Bland, Orn & Newman, 1988; Ramussen & Eisen, 1989; Robins et al., 1984). D'autres auteurs rapportent des taux similaires, avec 1.8% en Allemagne de l'Ouest et 2.5% en Finlande (Marks, 1987), et de 1.2 à 2.4% dans cinq communautés aux États-Unis (Karno, Golding, Sorenson, & Burnam, 1988). Certains soupçonnent même que ces taux représentent une sous-estimation du taux de prévalence réel dans la population en général, puisque peu de patients révéleraient leurs obsessions et compulsions sans être directement questionnés à leur sujet (Ramussen & Eisen, 1989). Par ailleurs, ces taux sont presque deux fois plus élevés que le taux de prévalence pour le

trouble panique, qui a fait sans aucun doute l'objet du plus grand nombre d'études parmi les troubles anxieux (Hafner & Miller, 1990).

L'introduction des techniques comportementales a considérablement amélioré le pronostic des gens souffrant du Trouble Obsessionnel-Compulsif (TOC). Dans sa forme initiale, l'approche comportementale se basait sur les théories de l'apprentissage qui stipulent que les obsessions produisent de l'anxiété et que les compulsions, bien qu'elles réduisent l'inconfort, renforcent l'émission de rituels futurs (Foa, Steketee, & Ozarow, 1985). Les traitements qui se basent sur l'exposition et la prévention de réponse ont démontré leur efficacité pour le TOC et différentes combinaisons de ces deux interventions ont été testées cliniquement (e.g., Van den Hout, Emmelkamp, Kraaykamp, & Griez, 1989; Foa, Steketee, & Grayson, 1985). Dans l'ensemble, les études rapportent des taux de succès se situant entre 55% et 85% avec les patients qui souffrent de TOC (Steketee & Shapiro, 1993).

Malgré les succès de l'exposition et la prévention de réponse avec le TOC, les résultats avec cette combinaison sont loin d'être optimaux (Steketee, 1993). D'abord, il demeure approximativement 25% des patients qui ne répondent pas à cette approche thérapeutique. Différents facteurs, comme la dépression sévère et l'anxiété, nuiraient à l'exposition (Foa, Steketee, & Groves, 1979). D'autres variables, comme la présence d'idées surévaluées ainsi que des troubles de personnalité comorbides, seraient associées à un moins bon pronostic avec ce type de traitement (Baer, & Jenike, 1990; Steketee, 1990; Foa, 1979). Enfin, les rechutes sont fréquentes, particulièrement lorsque les gains thérapeutiques ne sont pas optimaux à la fin du traitement (Foa, Steketee, Grayson, & Doppelt, 1983). Dans l'ensemble, lorsque l'on considère les refus et

les échecs thérapeutiques, seulement 50% des patients sont aidés par cette forme de traitement (Salkovskis, 1995).

Peu de chercheurs se sont intéressés à l'intégration de nouvelles formes de traitements pour le TOC jusqu'à récemment. Bien que plusieurs recommandent la thérapie cognitive avec ce trouble (e.g., Cottraux, 1989; Emmelkamp, 1987; Foa & Steketee, 1983; McFall & Wollersheim, 1979; Salkovskis, 1985, 1989; Salkovskis & Warwick, 1988; Warren & Zgourides, 1991) peu d'auteurs ont évalué empiriquement la thérapie cognitive, à l'exception du groupe d'Emmelkamp (Emmelkamp & Beens, 1991; Emmelkamp, van der Helm, van der Zanten, & Ploch, 1980; Emmelkamp, Visser, & Hoekstra, 1988; Neziroglu & Newman, 1990). Dans l'ensemble, ces études ont démontré que la thérapie cognitive de type Rationnelle Émotive (Ellis, 1962) serait efficace pour traiter le TOC. Néanmoins, certains problèmes méthodologiques limitent l'interprétation des résultats.

Parallèlement, les modèles cognitifs du TOC ont grandement évolué. Parmi les plus citées, figurent les modèles théoriques de Rachman (1993, 1974, 1971) et Salkovskis (1985, 1989, 1995). Inspiré par le modèle de Beck pour la dépression, Salkovskis propose une explication cognitive du TOC qui se base sur la présence d'un schème cognitif centré sur le thème de la responsabilité excessive. L'individu évaluerait ses intrusions cognitives en fonction du tort qu'il pourrait occasionner à lui-même ou aux autres. Cette évaluation erronée provoquerait de l'anxiété et de l'inconfort que l'individu tenterait de réduire avec diverses stratégies de neutralisation. La neutralisation se définit comme toute activité volontaire qui a pour but de chasser, prévenir ou diminuer la pensée obsédante (Ladouceur, Freeston, & Rhéaume, 1996). Les formes les plus

connues correspondent aux compulsions de vérification et de nettoyage. Toutefois, l'étendue des stratégies est beaucoup plus vaste et inclut des stratégies mentales et comportementales moins stéréotypées.

Salkovskis (1985) a aussi proposé que l'état émotionnel aurait un impact sur les symptômes OC et ce à différents niveaux. D'abord, les variations de l'humeur augmenteraient l'étendue des stimuli pouvant déclencher des intrusions et par le fait même les intrusions provoquant des pensées automatiques négatives. Il suggère que l'humeur pourrait aussi stimuler le niveau d'activité des schèmes cognitifs dysfonctionnels de base. Dans leur modèle, Ladouceur et ses collègues attribuent un rôle modulateur à l'état émotionnel dans le maintien des symptômes OC (Ladouceur, Freeston, & Rhéaume, 1996; Freeston & Ladouceur, 1996). D'abord, l'état émotionnel négatif augmenterait la fréquence et la durée des obsessions (Rachman, 1981). Ensuite, il augmenterait la possibilité d'évaluation inadéquate concernant la nature et la probabilité des conséquences négatives anticipées (Freeston & Ladouceur, 1995). Il a aussi été démontré que l'état émotionnel diminue l'efficacité des stratégies de neutralisation (Freeston, Ladouceur, Provencher & Blais, 1995). Enfin, l'état émotionnel négatif accentuerait l'hypervigilance pour les stimuli qui déclenchent les obsessions (Mathews, 1990) et diminuerait la motivation et l'habileté à pratiquer les stratégies apprises en cours de traitement.

L'intérêt suscité par ces nouveaux modèles théoriques a généré une prolifération d'études visant à tester différents éléments de ces modèles. Une des conséquences fût le développement impressionnant d'instruments de mesure pour les différentes cognitions pouvant être associées au TOC. À cela

s'ajoute l'élaboration d'études en laboratoire visant à mesurer les schèmes cognitifs ou d'autres processus. Bien que l'ensemble de ces études ait grandement contribué à accroître l'avancement des connaissances sur les aspects cognitifs et comportementaux du TOC, elles comportent aussi des répercussions négatives. En effet, considérant la disparité des instruments et des méthodes actuellement utilisés dans les études, les comparaisons entre les différentes études ainsi que la généralisation des résultats deviennent difficiles. Des efforts de conciliation sont présentement entrepris dans le milieu visant à développer des consensus sur l'utilisation des concepts et des instruments de mesure (e.g., The Obsessive Compulsive Cognitions Working group, 1996). Dans l'ensemble, bien que plusieurs études aient tenté de donner des appuis aux différentes parties de ces modèles (pour une revue, voir Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995), plusieurs de ces idées restent à être démontrées de façon empirique.

La proposition de nouveaux modèles cognitifs du TOC a aussi stimulé le développement de la thérapie cognitive pour ce trouble. Récemment, van Oppen et ses collègues ont comparé l'efficacité de la thérapie cognitive telle qu'inspirée par Beck (1976) à un traitement d'exposition et de prévention de réponse, dans une étude contrôlée (van Oppen, de Haan, van Balkom, Spinhoven, Hoogduin, & van Dick, 1995). Ils n'ont pas trouvé de différence significative entre les deux formes d'intervention sur les mesures de symptômes, après avoir contrôlé pour les différences entre les groupes au pré-test. Cependant, significativement plus de patients ayant reçu la thérapie cognitive étaient "rétablis" comparativement aux patients de la condition exposition. Dans une étude à cas unique, nous avons récemment obtenu des résultats cliniquement significatifs avec un traitement cognitif pur, portant

exclusivement sur la correction cognitive de la responsabilité avec 4 patients de type vérificateur (Ladouceur, Léger, Rhéaume, & Dubé, 1996). Cependant, nous croyons que d'autres types de distorsions cognitives peuvent maintenir les symptômes dans certains cas. Dans l'ensemble, ces résultats sont encourageants et justifient la poursuite de l'exploration de la thérapie cognitive pour ce trouble.

Récemment, Rachman (1996) et Salkovskis (1996) ont soulevé les limites des études actuelles qui tentent d'établir un lien entre les cognitions erronées et les symptômes OC. Ces auteurs soulèvent que le débat concernant la précedence des cognitions ou des comportements est stérile puisqu'il se concentre presque exclusivement sur l'efficacité du traitement, au détriment des variables de processus (Salkovskis, 1996). Le fait que la plupart des protocoles actuels se basent sur des scores sur des mesures générales au pré-test et post-test n'encourage pas l'examen des relations causales entre les variables de processus. Dans une présentation récente, Rachman (1997) a d'ailleurs mis en lumière la nécessité d'explorer les cognitions et les symptômes de façon continue et simultanée pour mieux comprendre les processus impliqués dans le maintien des symptômes OC.

Les quatre études présentes s'inscrivent dans un courant visant à développer et à appliquer des interventions thérapeutiques ayant des fondements théoriques et empiriques. De plus, bien qu'elles visent à tester l'efficacité d'un nouveau traitement, elles portent un intérêt particulier aux processus impliqués durant le traitement. Le deuxième chapitre vise à donner un appui empirique à certaines variables cognitives stipulées comme étant associées aux symptômes OC. Bien que réalisée auprès d'un échantillon de

volontaires sains, cette étude infère que les mêmes processus sont présents dans la population clinique. En effet, il a été suggéré que les différences entre ces deux populations seraient davantage quantitatives que qualitatives (Burns, Formea, Keortge, & Steinberger, 1995). Le troisième chapitre vise d'abord à tester l'efficacité d'une intervention cognitive qui se base sur la correction des variables associées aux symptômes OC, auprès d'un échantillon de patients avec des compulsions de vérification. Dans sa deuxième partie, ce chapitre explore les processus de changements cognitifs durant le traitement cognitif. On y vérifie aussi si des processus similaires sont observables chez les patients qui reçoivent un traitement comportemental. Ensuite, le quatrième chapitre explore la relation entre l'état émotionnel, les obsessions et les croyances durant un traitement cognitif-comportemental pour le TOC. Finalement, le cinquième chapitre discute brièvement les principaux résultats obtenus, leurs implications cliniques, théoriques et méthodologiques, et soulève des pistes de recherches futures.

CHAPITRE 2

LA PRÉDICTION DES SYMPTÔMES OBSESSIONNELS-COMPULSIFS: DES FACTEURS COGNITIFS MULTIPLES DE VULNÉRABILITÉ

Résumé

La plupart des travaux récents portant sur les aspects cognitifs du TOC ont été inspirés par le modèle proposé par Salkovskis (1985), qui postule la présence d'un schème dysfonctionnel de responsabilité chez les patients obsessionnels-compulsifs (OC). Plusieurs études empiriques ont démontré un lien entre la responsabilité et les symptômes OC autant chez les patients souffrant de TOC qu'auprès d'échantillons analogues. Comme d'autres variables cognitives, dont la surestimation du danger et le perfectionnisme ont été soulignées, la question qui se pose ici concerne la part relative de la responsabilité dans l'explication des symptômes OC. Cette étude explore la contribution relative du Danger Perçu, de la Responsabilité et du Perfectionnisme dans la prédiction des symptômes OC dans une population non clinique. Cent quatre-vingt-deux participants complètent le Questionnaire de Responsabilité (QR), l'Échelle-R (ER), le Questionnaire de Perfectionnisme (QP) et l'Inventaire de Padova (IP). Les résultats montrent que la responsabilité, le danger perçu et le perfectionnisme sont tous modérément reliés aux symptômes OC. Une analyse de régression hiérarchique démontre que le perfectionnisme explique une part significative de la variance de l'IP une fois l'effet des autres variables contrôlé. Dans la présente étude, les croyances concernant la responsabilité et le perfectionnisme sont des prédicteurs équivalents des symptômes OC. Ces résultats répliquent avec une nouvelle mesure de perfectionnisme ceux qui avaient été trouvés antérieurement. Les implications théoriques et cliniques sont discutées.

The prediction of obsessive-compulsive symptoms: New evidence for multiple
cognitive vulnerability factors

Josée Rhéaume, Robert Ladouceur, and Mark H. Freeston
Ecole de Psychologie, Université Laval, Québec, CANADA

Running Head: COGNITIVE PREDICTORS OF OC SYMPTOMS

Abstract

Much of the recent work on cognitive accounts of OCD has been inspired by the model proposed by Salkovskis (1985), which postulates the presence of a dysfunctional responsibility schema in Obsessive Compulsive (OC) patients. Several empirical studies have demonstrated a link between responsibility and OC symptoms among both OC patients and analogue samples. As other cognitive variables such as perceived danger and perfectionism have been pointed out, the question being asked here is to what extent responsibility can account for OC symptoms. This study explores the relative contribution of Perceived Danger (PD), Responsibility and Perfectionism in the prediction of OC symptoms in a nonclinical population. One hundred and eighty two participants completed the Responsibility Questionnaire (RQ), the R-Scale (R-S), the Perfectionism Questionnaire (PQ) together with the Padua Inventory (PI). Results showed that Responsibility, Perceived danger and Perfectionism were all moderately related to OC symptoms. Hierarchical regression analysis demonstrated that Perfectionism still accounted for a significant part of the PI variance once the other variables were partialled out. Beliefs about Responsibility and Perfectionism were equivalent predictors of OC symptoms. These results replicate previous findings with a new measure of perfectionism. The theoretical and clinical implications are discussed.

The prediction of obsessive-compulsive symptoms: New evidence for multiple cognitive vulnerability factors

Cognitive therapy for Obsessive-Compulsive Disorder has received a great deal of attention lately (e.g., van Oppen & Arntz, 1994; Van Oppen et al., 1995; Freeston, Rhéaume, & Ladouceur, 1996; Ladouceur, Léger, Rhéaume, & Dubé, 1996; Freeston et al., 1997). Limits in the efficacy of well-established behavioral packages may partially explain this heightened interest. Exposure and response prevention have a 75% success rate with OCD, but about 25% of suitable patients refuse this type of treatment (Foa, Steketee, Grayson, & Doppelt, 1983). When refusals and failures are considered, this means that only half of the Obsessive Compulsive (OC) patients are successfully helped by behavior therapy. These considerations suggest that different tools, such as cognitive correction (e.g., van Oppen & Arntz, 1994; Freeston et al., 1996) and group treatment (e.g., Enright, 1991; Epsie, 1986) may be used to improve treatment response, compliance and relapse prevention.

Another reason for the interest in cognitive therapy comes from the growth of cognitive models of OCD. Among the first attempts was Carr's model (1971, 1974), suggesting that OCD was due to both the overestimation of subjective probability and associated cost of potential threat (primary appraisal), and the underestimation of coping strategies (secondary appraisal). Others (e.g., Salkovskis, 1985, 1989; Salkovskis, Richards, & Forrester, 1995; Rachman, 1976, 1993) have suggested alternative explanations which are more specific to OCD (see Rhéaume, Freeston, Dugas, Letarte & Ladouceur, 1995). Several recent studies have been inspired by Salkovskis' cognitive model (1985). He postulates the presence of a dysfunctional responsibility schema in OC patients, leading them to evaluate their intrusive thoughts as a function of the harm

they could cause to themselves or others. His conceptualization is consistent with work done by Rachman, who had initially observed variations in compulsive activities associated with patients' perceived personal responsibility (Rachman, 1976; Rachman & Hodgson, 1980).

Manifestations of perceived responsibility in OC patients have been observed in experimental contexts (e.g., Lopatka & Rachman, 1995), hospital settings (e.g., Rachman, 1993), with outpatients (e.g., Salkovskis, 1989; van Oppen et al., 1995; Ladouceur, Léger, et al., 1996) and with pure obsessionals (Freeston, Ladouceur et al., 1997). Differences on responsibility measures were also obtained when OC patients were compared to normal controls (Freeston, Ladouceur, Gagnon, & Thibodeau, 1992; Freeston, Ladouceur, Gagnon, & Thibodeau, 1993).

Responsibility has also been the focus of several empirical studies with nonclinical participants. Burns and his colleagues have recently found empirical support for the use of analogue samples in the study of OCD (Burns, Formea, Keortge, & Steinberger, 1995). First, responsibility associated with OCD has been operationalized as the belief that one possesses the pivotal power to provoke or prevent negative crucial outcomes which may be real or moral (Salkovskis, Rachman, Ladouceur, & Freeston, personal communication, June 20, 1992). This definition has been supported empirically by questionnaire data (e.g., Rhéaume, Ladouceur, Freeston, & Letarte, 1995) and experimental manipulations (e.g., Ladouceur, Rhéaume, Freeston, Aublet, Jean, Lachance, Langlois, & De Pokomandy Morin, 1995). Significant correlations were found between responsibility measures and OC symptoms self-reports (e.g., Rhéaume, Ladouceur, Freeston, & Letarte, 1994; Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995). In a recent experimental manipulation of perceived responsibility, participants in the High Responsibility condition hesitated and

checked more during a classification task, were more preoccupied with errors, and reported being more anxious than participants in the Low Responsibility condition (Ladouceur et al., 1995). High Responsibility participants also made more modifications during the task and reported more subjective doubt, compared to the Low Responsibility condition participants (Ladouceur, Rhéaume, & Aublet, 1996).

The question being asked here is not whether perceived responsibility is associated or not with OCD, but to what extent it explains OC symptoms as proposed by Salkovskis (1985). Clinical observations and empirical studies (Gershuny & Sher, 1995; Frost, Steketee, Cohn, & Griess, 1994; Rhéaume, Freeston et al., 1995) have identified other cognitive variables that may contribute to the cognitive distortions seen in OCD. Perfectionism is one of them. For example, subclinical OC participants were more perfectionistic than noncompulsive individuals (Frost et al., 1994) and anxious controls (Gershuny & Sher, 1995). Perfectionism was a common feature in a group of obsessive patients without overt compulsion, whereas excessive perception of responsibility was not always evident (e.g., Freeston, Ladouceur et al., 1997). In a recent trial with compulsive checkers, cognitive correction of both excessive responsibility and perfectionism led to significant decrease of compulsions (Ladouceur, Rhéaume, & Léger, 1996).

Among the different perspectives on perfectionism, that proposed by Pacht (1984) is particularly interesting. According to Pacht, perfection does not exist, and the search for this perfect state is associated with psychopathology. Although very simple, Pacht's conceptualization has the advantage of being applicable to all aspects of human life. As perfectionism can also be a positive personality trait, Hammacheck (1978) made a distinction between pathological and healthy perfectionism. He suggested that pathological perfectionists, as

opposed to healthy ones, do not feel a sense of pleasure as a result from their efforts, do not let themselves be less precise in some situations, and feel that efforts are never sufficient. Although perfectionism has been associated with OCD in the literature (e.g., Pacht, 1984; Mallinger, 1984; Rasmussen & Eisen, 1989), there is currently no detailed model that defines its role in the disorder.

There is little evidence for a link between perfectionism, responsibility, and OC symptoms. In a recent study using questionnaires with nonclinical participants, perfectionism was still a significant predictor of OC symptoms once responsibility had been partialled out (Rhéaume, Freeston et al., 1995). Although responsibility was found to be a better predictor of OC symptoms, it has been hypothesized that the multidimensional nature of the perfectionism measure influenced this result. In this context, the ideas proposed by both Pacht and Hammacheck inspired the development of the Perfectionism Questionnaire (PQ). This instrument was developed in order to distinguish between functional and dysfunctional perfectionism. Construct validity was supported in a recent study showing that dysfunctional perfectionists, as defined by the PQ scores, reported significantly more scholastic procrastination, higher fear of negative evaluation, and a poorer self-esteem than functional perfectionists (Rhéaume, Freeston, & Ladouceur, 1995). In another study, dysfunctional perfectionists were slower on a precision task, reacted differently during an ambiguous decision making task and showed a different pattern of intrusions following an unresolved problem. They also obtained higher scores on an OC symptoms measure (Rhéaume, Freeston, Ladouceur, Bouchard, Gallant, Talbot, & Vallières, 1995). These results support the link between this conceptualization of perfectionism and OC symptoms.

Recent work on responsibility allows a better understanding of its role in the development and maintenance of OCD, leading to the development of

several techniques and clinical recommendations (e.g., van Oppen & Arntz, 1994; Lopatka & Rachman, 1995; Rachman, 1993; Freeston, Rhéaume, Ladouceur, 1996; Tallis, 1994). Considering the latest improvements of cognitive therapy based on the correction of excessive responsibility (e.g., van Oppen et al., 1995; Freeston, Ladouceur et al., 1997; Ladouceur, Léger et al., 1997), there is a need to investigate how other variables, such as perfectionism and a general perception of danger are linked to responsibility and OC symptoms in order to develop specialized cognitive interventions that are better adapted to this population.

The present study was conducted in order to investigate the respective links between Perfectionism, Perceived danger, Responsibility, and OC symptoms. First, moderate correlations were expected for all variables and OC symptoms, as these variables are all hypothesized as being related to the disorder (e.g., Rachman, 1993; Rhéaume, Freeston et al., 1995). Second, this study investigated the relative strength of Perfectionism, Perceived danger and Responsibility as predictors of OC symptoms. Although Responsibility should explain a greater portion of OC symptoms, Perfectionism should also explain a significant part of variance of OC symptoms, once Responsibility has been partialled out. As Perceived danger is a common but non specific component of OCD (Rhéaume, Freeston et al., 1995), it should be a moderate predictor of the PI scores when presented alone. However, it should be a weak predictor when entered in the model jointly with Perfectionism and Responsibility; variables which may involve the tendency to overestimate Perceived danger.

Method

Participants

One hundred and eighty two adults recruited from social work and psychology courses participated in the study. They completed the PI and a series of questionnaires on a voluntary basis in return for participation in a lottery. The total sample included 167 women and 15 men with a mean age of 23.17 years ($SD = 7.71$).

Instruments

The R-Scale (RS; Salkovskis, 1992) contains 27 items concerned with irrational beliefs related to personal responsibility (e.g., Doing nothing to prevent a negative outcome is as bad as causing the problem). For each item, participants mark on a 5-point scale, to what extent they believe them to be true. The French version (Letarte, Rhéaume, Freeston, Dugas, & Ladouceur, 1993) shows good internal consistency ($\alpha = .92$), and concurrent and convergent validity is satisfactory.

The Responsibility Questionnaire (RQ; Rhéaume, Ladouceur et al., 1994, 1995) was developed to give empirical support to a new definition of responsibility in OCD. The abridged version¹ consists of a 5-page booklet, containing 9 different OCD-relevant target situations. Examples of the situations are: Not being sure if the stove is turned off, transmitting a cold by sharing a glass, and doubting whether work is finished. After reading each situation, participants describe a possible negative outcome. Next, they rate on a nine point scale, the outcome on four different dimensions: severity, probability, influence, and pivotal influence. The first two dimensions, severity and probability, correspond to the "subjectively crucial aspect" of the responsibility definition. The next two dimensions, influence and pivotal influence, correspond respectively to power and pivotal power.

The Perfectionism Questionnaire (PQ; Rhéaume, Freeston, & Ladouceur, 1995) is a new measure developed in order to distinguish between functional and dysfunctional perfectionism. This instrument was developed in response to certain criticisms of the multidimensional measures of perfectionism which would include some correlates of perfectionism (Rhéaume, Freeston et al., 1995). The PQ contains 64 items and is divided into three subscales²: (1) perfectionistic tendencies (10 items, $\alpha=.82$), (2) domains affected by perfectionistic behavior (30 items, $\alpha=.88$), and (3) negative consequences of perfectionism (24 items, $\alpha=.96$). Construct validity is excellent.

The Padua Inventory (PI; Sanavio, 1988) is a 60-item measure of obsessive and compulsive symptoms. Four factors have been identified and replicated in Italy, Holland, the United States and Quebec: Mental Control, Contamination, Verification and Impulse Control. The psychometric properties of the abridged 40 item French version are excellent (Freeston, Ladouceur, Letarte, Rhéaume, Gagnon, & Thibodeau, 1995).

Procedure

At the beginning of class, participants completed a consent form. They then completed the RS, the RQ, the PQ, and the PI, presented in random order. Anonymity and confidentiality were ensured by using the last four numbers of the participants' telephone numbers for the lottery, and by separating the consent form and the questionnaires.

Variables

Five variables are measured in this study: (1) Beliefs about Responsibility (RS), (2) Perceived Responsibility (RQ-R), (3) Perceived Danger (RQ-D), (4) Perfectionism (PQ), and (5) OC symptoms (IP). Perceived Responsibility and



Perceived Danger were both measured by the RQ. The Perceived Danger score was calculated by multiplying both total probability and severity scores (Carr, 1971, 1974). In the same way, Perceived Responsibility was calculated by multiplying both the total perceived influence and perceived unique influence scores.

Results

The sample contained unequal proportions of women and men. Wilcoxon rank sum tests conducted on the different questionnaires revealed significant and near significant sex differences for the responsibility measures; men reported more Beliefs about Responsibility ($z = 2.62, p < .01$) and Perceived Responsibility ($z = 1.85, p < .065$) than women. Further control of sex was obtained by entering this variable first in the regression analysis. Sex did not explain a significant part of the PI scores, and was eliminated from the original model.

Correlation analysis

The correlations among the PI total score and the other questionnaires are presented in Table 1. Significant correlations were found among all variables. Obsessive-Compulsive symptoms were moderately related to Beliefs about Responsibility, Perfectionism, Perceived Responsibility, and Perceived Danger.

Insert Table 1 here

Correlations between PI subscales, Responsibility and Perfectionism are presented in Table 2. Beliefs about Responsibility was moderately correlated to

Mental Control and Checking, and weakly correlated to Washing. Perceived Responsibility was moderately correlated with Mental Control, and weakly correlated with both Washing and Checking. Perfectionism was moderately related to Mental Control, Washing and Checking.

 Insert Table 2 here

Correlations between Beliefs about Responsibility and Mental Control were significantly higher than for Checking ($T_2 = 4.57, p < .01$; Williams, 1959, cited in Steiger, 1980). There was also a trend in the same direction for Perceived Responsibility ($T_2 = 1.94, p > .05$). The correlation between Beliefs about Responsibility with Checking was significantly higher than with Washing ($T_2 = 2.41, p < .01$). Perceived Responsibility was not differentially correlated with Checking and Washing.

Hierarchical Regression analysis

Hierarchical regression analysis was used to determine the relative contribution of the three variables in predicting PI scores. Note that when Perceived Danger was entered after the other variables in the model, it explained less than one percent of the variance of the PI scores. However, we kept it entered first in the model to control for its part of explained variance. When entered in this position, Perceived Danger explained 17.6 % of the variance of PI scores ($F(1, 180) = 38.32, p < .0001$). When Responsibility variables were entered before Perfectionism, they accounted for 20.7 % of the variance ($F(2, 178) = 29.51, p < .01$) whereas Perfectionism accounted for 5.9 % ($F(1, 177) = 18.72, p < .01$). However, when the order was reversed, Perfectionism accounted for 18.5 % ($F(1, 179) = 51.25, p < .01$) and Responsibility for 7.7 % ($F(2,$

177)= 12.81, $p < .01$). As hypothesized, Perfectionism still accounted for a significant part of the variance once Responsibility had been partialled out. Moreover, compared to Perfectionism, Responsibility variables only accounted for an additional 2% of variance in OC symptoms when entered second. When both sets of variables were entered separately, betas were .18 and .50 for Perceived Responsibility and Beliefs about Responsibility, respectively, and .54 for Perfectionism. However, when all variables were entered together, betas were .24 and .47 for the Responsibility variables and .57 for Perfectionism. Entering the interaction set did not significantly improve the prediction.

Insert Table 3 here

Discussion

The correlations obtained between both responsibility measures, the PQ and the PI are all moderate, suggesting that both responsibility and perfectionism are related to OC symptoms. These results are consistent with those from a previous study using Frost's Multidimensional Perfectionism Scale (Rhéaume, Freeston et al., 1995). As the correlations between the PQ and the Responsibility scales are in the moderate range, it can be assumed that although related, they measure different constructs. These results support Salkovskis' model as a partial account of OCD, but indicated that perfectionism may also play an equally important role in OCD.

It has been proposed in the literature that manifestations of responsibility are more often observed in checkers (Rachman, 1993). However, the pattern of correlations between subscales of the PI and the Responsibility variables does not support this idea. First, the correlations are higher between

Mental Control and the two Responsibility variables than between Checking and the Responsibility variables. These differences were significant for Beliefs about Responsibility and near significant for Perceived Responsibility. Second, although Beliefs about Responsibility was more strongly correlated with Checking than Washing, Perceived Responsibility was not more strongly correlated with Checking than with Washing. Taking these results together, it seems a little soon to assume that responsibility would better predict checking behaviors than other types of OC symptoms. It should of course be noted that the pattern of results with Perfectionism was similar to the one obtained with Responsibility: Perfectionism was moderately related to Mental Control, Washing and Checking, and was weakly related to the Impulse subscale.

A hierarchical regression analysis was conducted to determine the unique contribution of perfectionism to predicting OC symptoms, by entering Perceived Danger and both Responsibility variables in the model before Perfectionism. Results suggest that both Responsibility and Perfectionism are better predictors of OC symptoms than Perceived Danger. More importantly, results show that Perfectionism explained a significant part of the variance of OC symptoms after Responsibility had been controlled. The Betas obtained for all variables also suggest that Perfectionism and Beliefs about Responsibility are OC predictors of the same strength. Taken together, these results give additional support for the underestimated link between perfectionism and OC symptoms.

Results obtained with the RQ-D scale are consistent with the last hypothesis. Indeed, Perceived Danger was not a significant predictor of OC symptoms, once Responsibility and Perfectionism had been controlled. This result is consistent with the idea that the perception of danger is a necessary but insufficient basis for the manifestations of OC symptoms (Ladouceur,

Rhéaume et al., 1995). This is also consonant with the interpretation of Carr's model where the overestimation of danger would represent a more general threat schema, which has also been observed in other forms of anxiety (e.g., Butler & Mathews, 1983). Salkovskis (1985) has suggested that the perception of danger without the evaluation of responsibility would rarely lead to a compulsive activity. However, we believe the addition of the Perceived Danger in the regression model gives a better representation of both general and specific variables associated with OCD.

The very high correlation between Perceived Responsibility and Danger suggests that these two constructs are quite related. This may be explained by the fact that both danger and responsibility evaluations were based on the nine vignettes of the RQ. A separate measure of perceived danger may have provided a better test of this construct. On the other hand, this is consistent with the definition of responsibility which contains both the pivotal aspect of the influence and perceived negative crucial outcomes (Rhéaume, Ladouceur et al., 1995). Despite the lack of independence between the two variables, results from the hierarchical regression analysis show that Perceived Danger is a weaker predictor of the PI (Beta=.02) than Perceived Responsibility (Beta=.18), suggesting that in terms of their relationship to OC symptoms, Perceived Responsibility includes the contribution of Perceived Danger. This supports the notion that Perceived Danger is a necessary but insufficient basis for the manifestations of OC symptoms.

Comparing the pattern of correlations with a previous study using the Frost Multidimensional Perfectionism Scale (MPS) (Rhéaume, Freeston et al., 1995) is interesting. The correlation between the PQ and the PI is very similar to the one obtained with the MPS in the original study ($r = .56, p < .0001$). However, the fact that the correlation remained stable with the use of the PQ is

promising since this measure is free of any developmental or social aspects, and was developed with a particular attention to exclude reference to OCD-like behavior that may be present in the Concern over Mistakes and Doubting subscales of the MPS, thus inflating the true correlation. This is consistent with a recent suggestion stipulating that perfectionism associated with OCD would be essentially self-referent (Freeston, 1994).

When compared to factorial designs, the present study did not permit a maximal use of the PQ, both the functional and dysfunctional dimensions of perfectionism being confined to the PQ total score. In previous studies with the PQ, median split on both the first (perfectionistic tendencies) and the third (negative consequences of perfectionism) subscales were used to separate functional from dysfunctional perfectionistic participants before comparing them on different measures. However, even when the more healthy aspect of perfectionism was not removed from the PQ score, perfectionism was definitely as important in predicting OC symptoms as responsibility.

Taken together, the results of the present study, if replicated with OC patients, have important theoretical implications. First, they add to the substantial empirical work supporting cognitive models that give responsibility an important role in the acquisition and maintenance of OCD. In the present study, this specific link was demonstrated even in the presence of other cognitive variables. Secondly, responsibility was associated with other variables such as perfectionism and the perception of danger, highlighting that responsibility alone may not account for OC symptoms. Thirdly, the similar strength of responsibility and perfectionism as predictors of OC symptoms suggests that perfectionism may be just as good a predictor as responsibility. In a recent attempt to include perfectionism in Salkovskis' model, perfectionism was viewed as a personality trait influencing the distorted responsibility

evaluation of intrusive thoughts (Rhéaume, Ladouceur et al., 1995). Like perceived danger, perfectionism was judged to be necessary but insufficient in the development of OCD. Although the present results do not show that perfectionism may account for the entire prediction, they suggest that perfectionism may play a more important role than previously estimated.

From a clinical standpoint, these results may contribute to the decentralization of cognitive correction of responsibility recently recommended (e.g., Freeston, Rhéaume, & Ladouceur, 1996; Freeston & Ladouceur, 1995) and already observed in some clinical trials with OC patients (e.g., van Oppen et al., 1995; Ladouceur, Rhéaume, & Léger, 1997; Léger, Freeston, & Ladouceur, 1996). Our clinical experience with OC patients, with and without compulsions, has raised some doubts about the need to correct only responsibility in treating these patients. In a recent adaptation of Salkovskis' theory, we have proposed that there are at least five types of faulty appraisals that may be present in some patients. They are the overimportance given to the intrusive thoughts, exaggerated responsibility, need to seek a perfect state, overestimation of the negative consequences, and beliefs about the negative consequences of anxiety. Although these faulty appraisals are not mutually exclusive, we believe that other appraisals may sometimes be more salient than responsibility for some cases (Freeston, Rhéaume, & Ladouceur, 1996).

Recently, it has been suggested that perfectionism would be more present in obsessions in which feared negative consequences in the real world are absent; the patient evaluating the mere presence of bad thoughts as proof that he is abnormal or imperfect (Rhéaume, Ladouceur et al., 1995). After we successfully corrected excessive responsibility with our compulsive checkers, some patients still felt the need to perform compulsions. The need for

perfection seemed to account for these remaining compulsions. This suggests that responsibility and perfectionism may sometimes be simultaneously present. Salkovskis' model has the advantage of being centered on a single cognitive variable, which is parsimonious at a theoretical level. However, taking all potential cognitive variables that are clinically relevant and appear to interfere with the normal functioning of OC patients may have greater explanatory power.

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Correspondence should be addressed to Josée Rhéaume, Ecole de psychologie, Université Laval, Québec, CANADA, G1K 7P4.

Footnotes

1 In a previous study using the original version of the RQ, correlations of .98 were found between both Influence total scores and Perceived Responsibility, suggesting that these variables measure the same construct (Rhéaume, Ladouceur et al., 1995). Since Pivotal Influence seems to be the central component of the definition of responsibility associated with OCD, we chose to keep both influence items to represent perceived responsibility. The original version of the RQ contained 14 situations (two of each seven OC themes). A factorial analysis was conducted on the 14 situations, and when both vignettes representing a same theme were loaded on the same factor, the situation with the highest subjective relevance was kept to represent this theme. Five situations were eliminated from the original version.

2 According to Hammacheck (1978), to be dysfunctional, perfectionistic people must not only have perfectionistic tendencies, they also must suffer from these tendencies. Coherent with this theoretical point of view, total score is calculated by multiplying the Perfectionistic tendencies total score (first subscale) by the Negative Consequence total score (third subscale).

Table 1

Matrix of Correlations among Beliefs about Responsibility, Perceived Responsibility, Perceived Danger, Perfectionism and Obsessive-Compulsive symptoms

	RQ-R	RQ-D	PQ	PI
RS	.48*	.48*	.58*	.58*
RQ-R		.70*	.39*	.46*
RQ-D			.42*	.42*
PQ				.56*

$N = 182$ participants. ** $p < .0001$.

RS = Responsibility Scale, RS-R = Responsibility Questionnaire-Responsibility, RS-D = Responsibility Questionnaire-Danger, PQ = Perfectionism Questionnaire, PI = Padua Inventory.

Table 2

Correlations between Perceived Danger, Responsibility, Perfectionism and the Padua Inventory subscales

	RS	RQ-R	RQ-D	PQ
MC	.66**	.46**	.43**	.55**
W	.27*	.38**	.31**	.41**
C	.44**	.35**	.32**	.42**
I	.22*	.08	.07	.29**
PI	.58**	.46**	.42**	.56**

$N = 182$ participants. ** $p < .0001$. * $p < .002$.

RS = Responsibility Scale, RQ-R = Responsibility Questionnaire-Responsibility, RQ-D = Responsibility Questionnaire-Danger, PQ = Perfectionism Questionnaire.

MC = Mental Control, W = Washing, C = Checking, I = Impulses, PI = Padua Inventory.

Table 3

Hierarchical Regression for Perceived Danger, Responsibility, and Perfectionism

	Beta	R ²	F
Danger (RQ-D) (first)	.02	17.55%	38.32**
Responsibility variables (second)		20.66%	29.51*
Beliefs (RS)	.30		
Perception (RQ-R)	.18		
Perfectionism (PQ) (third)	.31	5.99%	18.72*
Danger (RQ-D) (first)	.02	17.55%	38.32**
Perfectionism (PQ) (second)	.31	18.45%	51.25*
Responsibility variables (third)		7.74%	12.81*
Beliefs (RS)	.30		
Perception (RQ-R)	.18		

$N = 182.$

* $p < .01$

** $p < .0001$

CHAPITRE 3

LE TRAITEMENT COGNITIF ET LE TRAITEMENT COMPORTEMENTAL DU TROUBLE OBSESSIONNEL-COMPULSIF

PREMIÈRE PARTIE

UN EXAMEN DE LEUR EFFICACITÉ RELATIVE

Résumé

Malgré que les traitements basés sur l'exposition et la prévention de réponse ont clairement démontré leur efficacité avec le Trouble Obsessionnel-Compulsif (TOC), les résultats cliniques avec cette combinaison sont loin d'être optimaux (Steketee, 1993). Les récents modèles cognitifs et les derniers essais cliniques suggèrent que la thérapie cognitive pour le TOC est prometteuse. Le but de la présente étude est d'abord de tester l'efficacité d'un traitement cognitif ciblant des variables cognitives reliées au TOC (Freeston, Rhéaume, & Ladouceur, 1996). Ensuite, la thérapie cognitive est comparée à l'exposition et la prévention de réponse. Deux protocoles à cas uniques sont utilisés dans cette étude. Six patients OC avec des compulsions de vérification sont assignés alléatoirement à l'un des deux traitements de 24 rencontres. La thérapie cognitive porte sur la correction cognitive de la responsabilité excessive, des tendances perfectionnistes et de la surestimation du danger; aucun forme d'exposition ou de prévention de réponse n'est utilisée. Dans le traitement comportemental, l'exposition in vivo auto-dirigée et dirigée par le thérapeute est préconisée; aucune intervention cognitive n'est permise. Les deux traitements produisent des changements cliniquement significatifs pour les six patients au post-test. Les gains se sont maintenus au suivi pour tous les patients à l'exception d'un patient dans la condition d'exposition. Des analyses univariées de séries chronologiques montrent que pour les deux conditions de traitement, l'intervention donne des résultats statistiquement significatifs pour tous les patients. Les résultats suggèrent que la correction des croyances idiosyncratiques sans intervention d'exposition ou de prévention de réponse représente un traitement efficace pour les patients OC de type vérificateurs. Les implications théoriques et cliniques sont discutées.

Cognitive treatment and behavioral treatment of checking behaviors. Part one. An examination of their relative effectiveness.

Robert Ladouceur and Josée Rhéaume,
Ecole de Psychologie, Université Laval, Québec, CANADA.

Running Head: TREATMENT OF COMPULSIVE CHECKERS

Abstract

Although treatment based on exposure and response prevention has clearly shown its effectiveness with Obsessive-Compulsive Disorder (OCD), clinical results with this combination are less than optimal (Steketee, 1993). Recent cognitive models and the latest trials of cognitive therapy have shown that cognitive therapy for OCD is promising. The purpose of the present study was first to test the effectiveness of cognitive therapy targeting specific cognitive variables related to OCD (Freeston, Rhéaume, & Ladouceur, 1996). Second, cognitive therapy was compared to exposure and response prevention treatment for OCD. Two single case designs were used in this study. Six Obsessive Compulsive (OC) patients with compulsive checking were randomly assigned to either treatment for 24 sessions. The Cognitive Therapy (CT) focused on the cognitive correction of excessive responsibility, perfectionistic tendencies and overestimation of danger; no form of exposure and response prevention procedures were used. In the Exposure Treatment (ET), *in vivo* self-instructed and therapist-directed exposure were used. No cognitive interventions were allowed. Both treatments demonstrated clinically significant changes for the six patients at post-test and gains were maintained for all but one patient in ET at follow up. Univariate Time Series Analyses (TSA) show that for both treatment conditions, results were statistically significant for all participants. Results showed that correction of idiographic beliefs, without any exposure nor response prevention instructions, represents an effective treatment with OCD checkers. Both theoretical and clinical implications are discussed.

Cognitive treatment and behavioral treatment of checking behaviors. Part one. An examination of their relative effectiveness.

The introduction of behavioral techniques have considerably enhanced the prognosis for people suffering from Obsessive-Compulsive Disorder (OCD). The initial forms of treatments were based on learning theory which stipulates that obsessions produce anxiety and that compulsions, although reducing the discomfort, reinforce the emission of further rituals (Foa, Steketee, & Ozarow, 1985). Treatments based on exposure and response prevention have shown to be effective for OCD, and different packages of these two combinations have been tested with this disorder (e.g., Van den Hout, Emmelkamp, Kraaykamp, & Griez, 1989; Foa, Steketee, & Grayson, 1985). Overall, studies report between 55% and 85% success rates with obsessive-compulsive (OC) patients (Steketee & Shapiro, 1993). Moreover, better results have been obtained when these two components are combined rather than isolated (Foa, Steketee, & Milby, 1980).

Although treatment based on exposure and response prevention has clearly shown its effectiveness with OCD, clinical results with this combination are less than optimal (Steketee, 1993). First, still approximately a fourth of patients do not respond to this form of treatment. Indeed, the inability to suspend rituals and the difficulty tolerating anxiety during exposure sessions is often responsible for therapeutic failures. Different factors, such as severe depression and anxiety, would enable the patients to expose themselves (Foa, Steketee, & Groves, 1979). Other variables such as the age of onset, the presence of overvalued ideations, and comorbid personality disorders are all associated with a poorer prognostic with this type of treatment (Baer, & Jenike, 1990; Steketee, 1990; Foa, 1979). Second, these treatments are long and expensive, which considerably reduces their accessibility. Third, relapse is common,

especially when therapeutic gains are not optimal at the end of treatment (Foa, Steketee, Grayson, & Doppelt, 1983). Overall, considering both refusals and failures, only 50% of patients are being helped by this form of therapy (Salkovskis, 1995).

Despite these limitations, few researchers have been interested in the integration of new forms of treatments for OCD until recently. Although several authors have suggested cognitive therapy for this disorder (e.g., Cottraux, 1989; Emmelkamp, 1987; Foa & Steketee, 1983; McFall & Wollersheim, 1979; Salkovskis, 1985, 1989; Salkovskis & Warwick, 1988; Warren & Zgourides, 1991), few authors have empirically tested cognitive therapy with the exception of Emmelkamp's team (Emmelkamp & Beens, 1991; Emmelkamp, van der Helm, van der Zanten, & Ploch, 1980; Emmelkamp, Visser, & Hoekstra, 1988; Neziroglu & Newman, 1990). In one of their studies, they compared Rational Emotive Therapy (RET; Ellis, 1962) to in vivo exposure for the treatment of 18 OC patients. Results suggested that RET was as effective as exposure therapy (Emmelkamp et al., 1988). More recently, RET was compared to in vivo exposure and response prevention with 21 OC patients (Emmelkamp & Beens, 1991). Both therapies were found equally effective in reducing OC symptoms. Moreover, adding exposure to RET was not found to be superior to exposure alone. Overall, some methodological problems limit the interpretation of the results of these two studies, such as the absence of a structured diagnostic interview as a diagnostic tool and the lack of statistical power to detect significant differences. Moreover, most patients from both groups needed extra sessions of therapy after post-test, suggesting that both forms of therapy were not administered in an optimal way.

A growing interest in cognitive therapy has been raised by Salkovskis' cognitive model for OCD (Salkovskis, 1985, 1989, 1995). Inspired by Beck's

model for depression, Salkovskis proposed a cognitive explanation of OCD based on the presence of a cognitive schema centered on excessive responsibility. Several studies with both clinical and analogue samples have provided some empirical ground for Salkovskis' model, linking excessive responsibility to obsessions (e.g., Freeston, Ladouceur, Gagnon, & Thibodeau, 1992) and compulsive behaviors (Lopatka & Rachman, 1995; Ladouceur, Rhéaume, Freeston, Aublet, Jean, Lachance, Langlois, & De Pokomandy Morin, 1995; Steketee & Frost, 1993). Recent clinical trials were applied following this theoretical view (e.g., van Oppen, de Haan, van Balkom, Spinhoven, Hoogduin, & van Dick, 1995; Salkovskis & Warwick, 1985; Ladouceur, Léger, Rhéaume, & Dubé, 1996). Van Oppen and colleagues (1995) compared cognitive therapy and self-controlled exposure and response prevention in a controlled study. They found no significant differences between both treatment forms on the symptoms measures after controlling for pre-treatment differences between groups. No difference were found between cognitive therapy and exposure therapy in reducing OC symptoms. However, significantly more patients from cognitive therapy were rated as "recovered" compared to patients from exposure therapy.

The "purest" clinical application of Salkovskis model was done by Ladouceur and colleagues (Ladouceur, Léger et al., 1996) who treated four OC patients suffering from checking behaviors using exclusively the cognitive restructuring of excessive responsibility, without any form of exposure nor response prevention. Clinical significant results were found for all patients at post-test and gains were maintained at a six months follow up for 3 of them. However, the authors observed that responsibility was not predominant in at least two participants, where overimportance given to the meaning of intrusive thoughts and perfectionism were clearer. Tallis (1994) also observed

the presence of other variables, such as thought-action fusion and aggressiveness, in the etiology of two OCD cases. Although van Oppen and Arntz (1994) suggested that cognitive correction of excessive responsibility is necessary with OC patients, it is not clear at this point whether responsibility is always central in some cases.

Currently, there are enough data and clinical observations suggesting that responsibility is not the only cognitive distortion by which OC patients would appraise their intrusive thoughts (e.g., Rachman, 1993; Freeston, Rhéaume & Ladouceur, 1996; McFall & Wollersheim, 1979). For example, it has been suggested that OC patients have difficulty with their evaluation of a perceived danger, overestimating both the severity and probability of potential negative outcomes (van Oppen & Arntz, 1994; Salkovskis, 1995; Carr, 1974). Perfectionism has also been clinically observed (Freeston, Rhéaume & Ladouceur, 1996; Freeston, Ladouceur et al., 1997; Tallis, 1996) and empirically linked with self-reported OC symptoms in an analogue sample (e.g., Rhéaume, Freeston, Dugas, Letarte, & Ladouceur, 1995). In a recent study using a student sample, we found that responsibility and perfectionism were both significant predictors of OC symptoms (Rhéaume, Ladouceur, & Freeston, 1997).

Until now, there are few controlled studies that have evaluated the efficacy of cognitive therapy with OCD, and none have tested a specific cognitive intervention on perceived danger, responsibility and perfectionism. Taking into account the limitations of exposure therapy and the promising results of cognitive therapy, the present study empirically tests the application of a cognitive treatment, exclusively based on the cognitive correction of perceived danger, excessive responsibility, and perfectionistic tendencies in the treatment of checking behaviors.

The purposes of the present study are twofold. First, it tests the effectiveness of a pure cognitive therapy targeting specific cognitive variables related to OCD (Freeston, Rhéaume, & Ladouceur, 1996). Its effectiveness is then compared to that of standard exposure and response prevention therapy.

Method

Participants

Recruitment. Two different methods were used to recruit participants. An advertisement was published in a Quebec newspaper and letters were addressed to mental-health professionals in the area. Seventy-two potential participants called our clinic and were screened by a professional psychologist experienced with OCD. From this pool, fifteen participants presenting clinical features of OCD with predominant checking behaviors were invited for a clinical diagnostic interview. In each case, the diagnosis was established using the Anxiety Disorder Interview Schedule-Revised for the DSM-III-R (ADIS-R-III; APA, 1987). Each diagnosis was confirmed by having an independent psychologist with four years of experience with anxiety disorders listen to the audiotaped interviews.

Exclusion criteria. The following exclusion criteria were used: (a) principal diagnosis other than OCD; (b) presence of other types of compulsions more prominent and distressing than checking behaviors; (c) self-report of less than one hour of obsessions, compulsions, or minimal interference; (d) duration of illness being less than six months; (e) current diagnosis of alcohol dependency or abuse; (f) any signs of bipolar disorder, psychotic features, or severe personality disorders; (g) age below 18 or above 65; (h) refusing to interrupt a concurrent psychological treatment; (i) if taking medication, have

used it for less than one month and (j) refusal to maintain medication during treatment.

Sample. Ten participants (5 self-referred and 5 referred by professionals) met the selection criteria for the study and were randomly assigned to each treatment condition. Of these patients, one withdrew during baseline measurement because of a complicated pregnancy. Another patient was excluded after 8 weeks for not respecting medication intake. One patient abandoned treatment after 12 weeks because of his wife's suicidal attempts. Another patient withdrew after 8 weeks; despite a decrease of checking behaviors, the patient still had magical numbers associated with family members which forced him to perform some compulsions in order to prevent danger from occurring to them. Foa and Steketee (1983) have pointed out that magical thinking constituted a poor prognostic for OCD. During the course of therapy, this patient also reported having started drinking alcohol again after two years of sobriety. The proportion of withdrawals was equivalent for both conditions. The final sample consisted of six patients, three in each treatment condition.

Patient 1 was a 40 years old married mechanic without any children. For three years, he had been suffering from obsessions about errors he may have made while fixing cars. He compulsively checked nuts, and bolts when installing tires and doing other repairs. Because of his doubts, he refused promotions in the garage and avoided major repairs such as motor problems. After work, he ruminated about potential errors made during the day. Both checking and ruminations about potential errors took up about three hours of his day.

Patient 2 was a 21 years old woman, living with her parents. She had quit college after a year and was without work. She was suffering from severe

compulsions that had started five years ago. She had checking rituals of water tap, the refrigerator door, the front door and windows. She also had to make sure everything was clean and in the right place. She often counted in order to make sure she had checked enough times, or rigidly stared at things to insure they were perfectly closed. Checking and staring would last more than 8 hours a day. The patient often felt that all she did during the day was check things. She also did a lot of hand washing and was preoccupied with cleanliness, but these compulsions were less interfering than the compulsive checking. She had been on 75mg of clomipramine for three years.

Patient 3. This 41 year old woman lived in her house with her husband and two teenagers. She worked as a maid in an important hotel. Her main concern was the potential errors made while cleaning rooms. This began four years prior to consultation. She checked each of the 14 rooms she cleaned 6 or 7 times, looking for forgotten soap, towels, or a spot of dirt, and often returned if too much in doubt. Overall, her compulsive checking took up two hours a day. She was afraid that she would be blamed if her job was not perfectly done. She was also repetitively checking doors, the stove and electric appliances at home.

Patient 4. This 36 year old man was living in an apartment with his wife and baby boy. He had been suffering from checking behaviors related to lights, doors, electric appliances, money, and keys for 15 years. He also had to compulsively check whether he was correctly shaved and dressed, if everything was clean before leaving home, and if the parking brake was on when leaving the car. He was bothered by excessive doubts about what he had read and repetitively checked letters, bills, and important documents. His rituals had lead him to fail his professional internship twice. At the time of

treatment, he was working part time in a hospital. He had been on 60 mg of fluoxetine for seven months before starting treatment.

Patient 5. This 31 year old married woman complained of more than 15 years of several checking rituals for doors, windows, the electric heating system, lights, and other objects. When checking, she was also repeating words such as "closed" or "checked". She was obsessed with the idea of preventing something bad from happening to her 6 year old daughter. She was also excessively concerned with order and checked several times a day to see if things were in the right place. Her rituals were taking up three hours each day. This patient also met diagnostic criteria for Obsessive Compulsive Personality Disorder and had been taking 80 mg of fluoxetine for three years before beginning treatment.

Patient 6. This 43 year old lawyer was divorced, had no children, and was living alone. For twenty years, he had suffered from checking rituals associated with water taps, electric maintenance, lights, doors and windows, which he checked for more than two hours a day. He was also extremely preoccupied with the idea that his house could collapse and fall on children, or that he may be responsible for a flooding resulting from not turning the water tap off correctly. He was often late to work because of his rituals and had not used his bath over the last year.

Experimental protocols

Two single cases multiple baseline design across subjects were used (see Kazdin, 1993). In these protocols, the intervention is introduced at a different moment for each patient. It is possible to establish a causal relationship when change for each patient follows closely the introduction of intervention. In this study, we extended the baseline duration for participants in each condition

in order to permit visual inspection. However, different baseline length is not a necessary condition for statistical intervention analysis with Time Series Analysis (TSA).

Baseline

Three sessions of approximately ninety minutes were conducted during baseline for assessment and explanation of self-rating procedures. Before the establishment of baseline (from 30 to 50 days), the clinician identified obsessions and compulsions with the patient and explained the self-rating methods. At this stage, the therapist assessed the onset of the disorder, its evolution, the familial history and the social domains affected by the disorder. An independent evaluator administered the Yale Brown Obsessive Compulsive Scale (YBOCS; Goodman, Price, Rasmussen, Mazure, Fleischmann, Hill, Heniger, & Charney, 1989a) semi-structured interview to assess the severity and depth of OC symptoms. The therapist also identified relevant beliefs concerning responsibility, perfectionistic tendencies, and subjective threat.

Dependent variables

Self-ratings

Obsessions and compulsions. Participants rated (1) the presence of checking behaviors and (2) obsessions, (3) the interference caused by checking and (4) obsessions, as well as (5) time spent on the most important ritual and (6) another ritual. These variables were measured by daily self-rating scales that patients completed at the end of each day, during all treatment and a week before the six month follow up. Our research team has already used these scales with OC patients (see Ladouceur, Freeston, Gagnon, Thibodeau, &

Dumont, 1993). They consisted of small booklets in which the first page contained the general 0 to 100 category partitioning scale (Ellermeier, Westphal & Heidenfelder, 1991), followed by six pages; one for each question. At the end of the day, patients evaluated the different variables with the scale.

Symptom measures

The Yale-Brown Obsessive-Compulsive Semi-structured interview (Y-BOCS; Goodman et al., 1989a) assesses severity of obsessions and compulsions with 10 questions. First, patients are presented with a list of OC symptoms for which they rate extent to which they have experienced each of them in the past and the extent to which they are experiencing them. The patient then answer different questions about all their obsessions or compulsions over the last seven days. The interview shows good internal consistency, sensitivity to clinical change, and good concurrent validity (Goodman et al., 1989a, 1989b). Although Woody and colleagues obtained a poor test-retest reliability after 48 days (Woody, Steketee, & Chambless, 1995), the Y-BOCS is the best available measure of OC symptoms in terms of reliability, validity and sensitivity to treatment effects (Taylor, 1995).

The Padua Inventory (PI; Sanavio, 1988) is a 60-item measure of obsessive and compulsive symptoms. Four factors of this scale have been identified and replicated in Italy, Holland, the United States and Quebec: Mental Control, Contamination, Verification and Impulse Control. The psychometric properties of the French version are excellent (Freeston, Ladouceur, Letarte, Rhéaume, Gagnon, & Thibodeau, 1995). The abridged 40 items version was used.

The Compulsive Activity Checklist (CAC; Marks, Hallam, Connolly, & Philpott, 1977) assesses interference caused by obsessive-compulsive behaviors.

The French version shows good internal consistency ($\alpha = .79$) and good stability (test-retest: $r = .68$) (Freeston, Ladouceur, Gagnon, & Thibodeau, 1993). The short 19-item version is a French translation by Cottraux, Bouvard, Defayolle, & Messy (1988).

General functioning

The Beck Depression Inventory (BDI; Beck, Rush, Shaw, & Emery, 1979) measures the presence and severity of depressive symptoms. The French version (Bourque & Beaudette, 1982) shows good reliability ($\alpha = .92$; test-retest: $r = .62$). The 13-item abridged version was used.

The Beck Anxiety Inventory (BAI; Beck, Epstein, Brown, & Steer, 1988) is a list of 21 anxiety symptoms. The psychometric properties of a French translation (Freeston, Ladouceur, Thibodeau, Gagnon & Rhéaume, 1994) demonstrates good reliability ($\alpha = .85$; test-retest: $r = .63$) and good convergent, discriminant and factorial validity.

Process measures

The Perfectionism Questionnaire (PQ; Rhéaume, Freeston, & Ladouceur, 1995) was developed in response to criticism of previous measures of perfectionism which includes correlates of perfectionism. The PQ contains 64 items and is divided into three subscales: (1) perfectionistic tendencies (10 items, $\alpha=.82$), (2) domains affected by perfectionistic behavior (30 items, $\alpha=.88$), and (3) negative consequences of perfectionism (24 items, $\alpha=.96$). The instrument shows good construct validity.

The Responsibility Questionnaire (RQ; Rhéaume, Ladouceur, Freeston, & Letarte, 1994, 1995) was developed to give empirical support to a new definition of responsibility in OCD (Salkovskis, Rachman, Ladouceur &

Freeston, personal communication, June 1992). It consists of a 15-page booklet; the first page containing the instructions and each subsequent page starting with different OCD-relevant target situations. Examples of the 14 situations are: Not being sure if the stove is turned off, transmitting a cold by sharing a glass, doubt about finished work, and unacceptable sexual thoughts. After reading each situation, participants described a possible negative outcome. Next, they rated on a nine-point scale this outcome on six different dimensions: severity, probability, influence, pivotal influence, responsibility and relevance. The total responsibility score is calculated by summing the responsibility ratings for the 14 situations. The reader is referred to previous studies (Rhéaume et al., 1994, 1995) for details on the development and psychometric properties of the instrument.

The R-Scale (RS; Salkovskis, 1992) is a belief scale about responsibility in OCD. It contains 27 statements typical of obsessional patients (e.g., Doing nothing to prevent a negative outcome is as bad as causing the problem). A French adaptation of the initial version has recently been developed for the purpose of a series of studies on OCD. The instrument shows a good reliability ($\alpha=.94$) and concurrent validity (Rhéaume, Ladouceur, & Freeston, 1996).

Participants completed all measures before treatment, at post-test and at six month follow up.

Treatments

Cognitive Treatment (CT). Twenty-four one hour sessions were conducted over sixteen weeks; two sessions a week for the first half of treatment and one session a week for the last half. Treatment consisted of cognitive correction of dysfunctional attitudes and beliefs concerning the patient evaluation of danger, responsibility, and perfectionism using the

cognitive therapy developed by Beck and his colleagues (Beck, 1976; Beck, Rush, Shaw, & Emery, 1979), and specific clinical guidelines for this population (Freeston, Rhéaume & Ladouceur, 1996). For each cognitive variable, the following steps were taken: (1) the identification of situations in which the patient has his or her erroneous beliefs, (2) automatic thought training awareness, (3) the correction of automatic thoughts, and (4) the development of alternative adequate perceptions concerning the situations.

Subjective overestimation of danger. Treatment targeted distorted evaluations of danger that patients attributed to specific situations. Subjective probability and severity of negative outcomes were confronted and re-evaluated more objectively. Patients then had the possibility to compare the importance they attribute to a specific situation while not being attentive to other situations with greater objective probability or severity.

Excessive responsibility. Patients were invited to pay more attention to situations in which they took more responsibility than they should have. Several cognitive techniques correcting responsibility have been developed lately. An example consists of dividing a whole 'pie' of total responsibility between all agents that may have a role in influencing the occurrence of the negative anticipated outcomes (van Oppen & Arntz, 1994). The patient must first determine the responsibility of others and then his or her own personal influence on the outcome. Using such exercises, the patients are able to adopt more appropriate perceptions of the situations.

Perfectionistic tendencies. OC patients often believe that a perfect state exists and that it is only a question of making efforts to achieve it. These attitudes are

often characterized by "all or nothing" thinking (Pacht, 1984); patients thinking that if they can not achieve their ultimate goal, it is as bad as doing wrong. Perfectionistic thinking in OCD is not only related to concrete situations, but may apply to different domains such as the need for perfect certainty, perfect control over thoughts, or a perfect internal state (Rhéaume et al., 1995). This dichotomous way of thinking is emphasized during treatment and challenged by having the patient list the advantages and inconveniences of thinking in that way. Previous experiences where the patients have "felt perfection" were also re-evaluated.

Since it has been suggested that both responsibility and perfectionism may not be necessarily present together or at a same level in some patients, treatment was oriented in function of the presence and importance of both cognitive targets.

Exposure and Response Prevention Treatment (ET). Participants from this condition received a treatment based on in vivo exposure and response prevention of checking behaviors (Steketee, 1993; Foa & Steketee, 1983). This treatment package is actually the gold standard with OC patients (Steketee & Shapiro, 1993).

In vivo exposure. Stimuli provoking discomfort were identified during sessions and hierarchically listed in terms of perceived threat by the patients. Participants were then instructed to gradually expose themselves to these situations, beginning with the less threatening situations, and to tolerate the discomfort produced by the confrontation. When judged necessary, the therapist was present for some exposure sessions to make sure exposure was done properly. In some cases (e.g., compulsions occurring at their job), it was

not possible to be present for their exposure. In these cases, in vivo exposure was practiced with the therapist for other rituals in order to facilitate self-directed exposure in other situations. Some patients spontaneously suggested that they try exposure alone first. The general attitude was to assist patients whenever there were some doubts about their ability to do or to comply with self-directed exposure.

Response prevention. Participants received instruction to restrain from checking during and following exposure to threatening situations. For most patients, a gradual decrease of checking behaviors was done instead of stopping them all at once. A normal frequency of checking was permitted (e.g., a single checking of the front door lock when leaving home) and criteria for normality in specific situations were examined with the therapist.

Therapists

Three patients were treated by the second author, a doctoral student with three years of cognitive-behavioral clinical experience with OCD. The remaining three patients were treated by a licensed psychologist with one year of clinical experience with cognitive therapy of OCD. Therapists conducted therapy in both treatment conditions.

Treatment integrity

Treatment integrity of both conditions was ensured by having two independent evaluators listen to 15% of the treatment sessions for each patient. As recommended by Kazdin (1993), both the necessary and not allowed interventions were listed on distinct grids for each condition. The mean agreement score was 96.6% for Cognitive Therapy and 94.9% for

Exposure Therapy. Agreement rates were similar for cases treated by both therapists, supporting the conclusion that both treatments were conducted appropriately by both therapists.

Treatment credibility and expectancies for improvement

An adapted French version of the one developed by Borkovec and Nau (1972) was used to assess patients' belief in the credibility of treatment and expectancies for improvement. An initial version was completed by participants after the second week to make sure that the therapeutic model for OCD was fully understood by the participants. Of the seven questions, five were concerned with treatment credibility (e.g., How logical do you consider this treatment for your OCD problem?), and two evaluated expectancies for improvement (e.g., How much exaggerated checking do you think you will be doing at the end of treatment?). A post-test version was administered after treatment. Socially desirable responses were reduced by telling participants that the experimenter would not see their comments, and by having them put their questionnaire in a sealed envelope.

Results

Individual pre-treatment differences

Although the limited number of participants does not permit an empirical comparison of individual differences between groups, Table 1 presents the ADIS-III-R severity scores, comorbidity, Y-BOCS scores, duration of illness and medication for participants from both conditions. Both the ADIS-III-R and the Y-BOCS pre-treatment scores suggest that patients from both conditions were similar according to symptom severity and comorbidity.

One patient, compared to two patients, were taking antidepressive medication. Most differences between groups stem from the comorbidity and duration of illness; participants in CT reporting more comorbid axis I disorders but shorter duration of illness, compared to patients in ET.

Insert Table 1 here

Self-ratings

In this study, Time Series Analysis (TSA) was used to empirically test the therapeutic effect on each patient's self-rating data (Checking Interference). Although TSA has been used for the analysis of therapeutic effect in several distinct psychological domains (e.g., Jones, Ghannam, Nigg & Dyer, 1993; Savard, Laberge, Gauthier, Fournier, Bouchard, Baril & Bergeron, 1996; Junginger & Head, 1991), its use in social sciences is relatively new. This statistical method is more reliable than the traditional visual inspection of data which has obtained poor interjudge reliability across studies over time (e.g., DeProspero & Cohen, 1979; Wampold & Furlong, 1981; Furlong & Wampold, 1982). Two other considerations for the careful use of visual inspection are particularly relevant for OCD. The interpretation of therapeutic effect by visual inspection is greatly facilitated when the change in data is abrupt and when there is a low variability of the data within each phase of the series (Kazdin, 1993); two conditions that are often not obtained with this clinical population (Ladouceur et al., 1993; Freeston, Ladouceur et al., 1997). TSA is also consider to be superior than usual statistical tests such as ANOVAs and t-tests, because it controls for the effects of auto-correlations in serial data (Wei, 1990).

This analysis contains three steps: (1) the estimation of the model, (2) the estimation of the parameters, and (3) the diagnostic checking of the model

(Bouchard, Gauthier, Nouwen, Ivers, & Pelletier, 1993). If the model is adequate, the residuals should not contain any significant auto-correlations once the model has controlled for serial dependency between observations. The intervention analysis then consists of adding an intervention variable (w) to the baseline phase model to test whether this new model better predicts the series. A treatment will be judged as significant if the model better predicts the data with the intervention variable than without it.

In the present study, series representing Checking Interference were submitted to TSA in order to first establish the mathematical model for each patient. This variable was chosen because it reflects all checking symptoms as opposed to time spent during the main ritual. Figure 1 depicts the series for each participant.

Insert Figure 1 here

Results of the time-series analysis for each patient of both conditions are presented in Table 2. For each patient, the first part of the table shows the mathematical model best describing the baseline phase and the statistical significance of all parameters present in the model. To accept the model as adequate, two conditions were necessary: The residuals should not be significant at any of the 12 first lags, and the Schwarz's Bayesian Criterion (SBC) had to be the lowest within the potential models. Once the model explaining the serial data was adequate, the intervention analysis was conducted, which consists of the modeling and diagnostic checking of the intervention effect. The intervention effect may be described as a level shift in the series, and represented by a 'W' indicating the immediate effect of the intervention. The effect could also be more gradual, such as a change in slope

of the observations. Here we use 'S', describing the rate of change in the intervention.

Insert Table 2 here

Results show that the intervention was significant for all participants. In CT, the effect of the intervention was gradual for 2 participants (participants 1 and 3) as shown by a significant slope change, and one patient (patient 2) showed a level change. For two participants in ET (participants 4 and 5), the effect of the intervention took the form of a level change, whereas patient 6 showed a significant slope change.

Symptoms measures

Table 3 shows the individual scores on the OC symptoms measures before treatment, after treatment and at six month follow up. Results show that for all participants in CT, scores on the Y-BOCS decreased after treatment. Scores for the three participants decreased 9, 24, and 11 points after treatment. Moreover, the gains were maintained or continued to decrease for all participants at the six month follow up. Participants in ET also showed a decrease on the Y-BOCS after treatment. Scores decreased 14, 17 and 21 points at post-test. However, scores for participants 4 and 6 both increased at follow up. Moreover, despite the fact that patient 5 refused to come for the follow up evaluation, a phone discussion with her revealed that she had relapsed entirely a couple of weeks after the end of treatment. Scores on the Padua Inventory show a similar pattern. All participants from both conditions showed a decrease at post-test. However, only one patient from CT (patient 2) lost considerable gains at the six month follow up as opposed to all participants

from ET who showed an increase of their scores on that measure. Scores on the CAC were more difficult to interpret but generally demonstrate the same tendency since all participants showed a decrease at post-test and all but two participants from ET showed some relapse on this instrument at follow up.

Insert Table 3 here

General functioning

Results on the BAI and the BDI show that both CT and ET were helpful in reducing anxiety and depressive symptoms exclusively for participants with high pre-test scores on the two measures (patient 2 and 6). However, those gains were only maintained at follow up for patient 6 (see Table 4).

Insert Table 4 here

Process measures

Individual scores on the R-Scale, the RQ and the PQ are presented in Table 5. Results were less interpretable for the three measures, compared to the symptoms measures. Generally, all participants from both conditions showed a slight decrease after treatment on both measures of responsibility and perfectionism. However, scores tended to return to pre-test scores six months after treatment. One exception was patient 6 who seemed to maintain his scores on the three measures at follow up.

Insert Table 5 here

Clinical significance

Two indications of clinically significant changes were calculated: endstate functioning and the magnitude of change during treatment. According to Jacobson and Truax (1991), significant clinical change occurs when "the level of functioning subsequent to therapy places that client closer to the mean of the functional population than it does to the mean of the dysfunctional population" (Jacobson and Truax, 1991, p. 634). When norms for the symptoms measures are available and when functional and dysfunctional distributions of scores do overlap, the following formula is recommended:

$$c = \frac{s_0M_1 + s_1M_0}{s_0 + s_1}$$

Where "c" is the cut-off score, "s" the standard deviation and "M" the mean score (Jacobson & Truax, 1991, p. 637). The cutoff point for clinically significant change for the Y-BOCS was 13.75, 24.6 for the PI, and 1.78 for the CAC.

Another way to determine clinical significant change is by addressing the question of "how much change has occurred during the course of therapy" (Jacobson & Truax, 1991, p. 636). Thus, a severe patient's score may reflect significant changes but still not be within the normal range after treatment. Jacobson and colleagues (1984) have proposed a reliable change index. When RC is larger than 1.96, it can be concluded that the post-test score reflects real change. Clinical significance for the symptoms measures and process measures at post-test and follow up are presented in Tables 3, 4 and 5.

Results show that for all 6 participants, Y-BOCS scores were in the nonclinical range after treatment. Two out of 3 participants in CT and 2/3 participants in ET scored in the nonclinical range on the PI at post-test. Note that for patient 3 in CT, reliable changes were obtained although still within the clinical range. For the CAC, 2/3 participants in CT and 1/3 participants in

ET scored within the nonclinical range after treatment. Overall, two participants in both conditions were clinically improved on at least two symptoms measures at post-test (see Table 6). At follow up, all but one patient in ET were in the nonclinical range on the Y-BOCS. On the PI, scores tended to regain clinical range for one patient in CT and 2 participants in ET, while 1/3 of each condition remained in the nonclinical range for CAC.

For general functioning measures, results show that all participants scored in the nonclinical range on the BDI after treatment, and all but one patient in CT scored in the nonclinical range on the BAI. At follow up, results were maintained for 2/3 of the participants in both conditions on the BDI, and for 1/3 of the participants in CT and 2/3 of the participants in ET on the BAI.

Insert Table 6 here

Treatment credibility and expectancies for improvement

Beliefs in treatment credibility scores and expected exaggerated checking by participants from both conditions at the beginning and after treatment are presented in Table 7. Because the limited number of participants, no statistical analysis was performed to compare both groups on these variables. However, the examination of the individual scores from participants of both treatment condition suggests that treatment credibility was high for all participants since all scores were higher than 22 on a possible total score of 30. Expectancies appears similar for both conditions. The number of expected exaggerated checking was variable across participants, but were generally extremely low both before and after treatment for all participants.

Insert Table 7 here

Discussion

The main aim of the present study was to test the effectiveness of cognitive therapy targeting excessive responsibility, perfectionism and perceived danger in decreasing compulsive checking. Results from TSA showed that daily self-rating of Checking Interference significantly decreased during treatment for the three participants treated with CT. Moreover, the examination of clinical significance showed that all participants's scores on the Y-BOCS were in the nonclinical range after treatment. Taken together, results from both self-rating data and the symptoms measures suggest that correction of idiographic beliefs without any intervention on exposure or response prevention instructions represents an effective treatment for OCD checkers. Moreover, six months after treatment, all participants who received CT maintained their gains. Despite the challenge that pure cognitive therapy often presents for both therapists and patients, it may be a less threatening form of intervention for some patients who refuse classical exposure therapy.

A second aim of the present study was to examine the relative effectiveness of both CT and the standard ET in the treatment of compulsive checking. Both treatments demonstrated statistically significant change for the six patients after treatment. Although visual inspection of the series on checking interference suggests that the effect of treatment was greater in the exposure condition since all patients rated being free of Checking Interference at post-test as opposed to none in the cognitive therapy, both interventions were statistically significant for all participants. Note that the effect of treatment was variable across participants from both conditions. For one patient in CT and two participants in ET, the intervention effect was abrupt

(level change), whereas for the other participants, the effect was more gradual (slope change). It is worth noting that one limitation of visual inspection in the interpretation of intervention effect is that the therapeutic change must occur abruptly to be easily interpreted (Kazdin, 1982). In the present study, the effect of the intervention was gradual for half of the participants, a tendency that has previously been observed with this population (e.g., Freeston, Ladouceur et al., 1997; Ladouceur et al., 1993). Thus, the use of time-series intervention analysis was especially useful in determining the statistical significance of therapeutic effect that is less visually obvious. Since the six month follow up contained only one week of self-report data, TSA could not be computed to test if changes were still significant at this point. However, visual inspection of the these data suggests that Checking Interference was maintained at the same level as the post-test scores for all patient but one in ET.

Both treatments demonstrated clinically significant changes for the six patients at post-test. All Y-BOCS scores were in the normal range after treatment and all but one patient in Exposure Therapy maintained gains at follow up on this measure. Although 2 participants in each condition scored on the PI in the nonclinical range after treatment, only one patient in each condition maintained those gains at follow up. Results on the CAC tend towards the same direction. Overall, 2 participants in both conditions showed clinically significant changes on at least two symptoms measures at post-test and follow up. Two participants in CT showed clinically significant changes on the three measures while only one patient in ET. At follow up, only one patient still maintained those gains in CT. Van Oppen and colleagues (1996) have studied the treatment sensitivity of three measures of OC symptoms and found that the Y-BOCS was more sensitive to treatment effects than the PI (van

Oppen, van Balkom, & van Dyck, 1996). Results of the present study are coherent with these results.

Results on the process measures were less interesting, although most of the participants who scored within the clinical range before treatment (e.g., patient 5 and 6) were classified as recovered on the three process measures at post-test and follow up. Indeed, nearly half of the participants from both groups showed adequate scores on the three instruments before treatment. This may be that the idiographic cognitive distortions regarding responsibility and perfectionism were not captured by these general beliefs scales. This may also result from a lack of sensitivity in the measures, since clinical and normative distribution of scores of these instruments overlapped too much. It has been suggested that since process measures reflect too general statements, using global scores may not sensitively reflect clinical change after therapy (Rachman, 1996).

Of course, one may also argue that results from the process measures may also suggest that cognitive change did not really occur following CT in the present study. Indeed, it has been proposed that the mechanism of change during CT may not change cognitive schema, but CT may provide the patient with a repertoire of strategies for coping with stressful emotional experiences (Persons, 1993), thus leaving the schema intact at the end of therapy. If what Persons (1993) suggested is true for OCD, the small decrease on process measures may reflect that schemas are still present but that the patient now possesses some skills for not following this rigid way of thinking. Although this explanation is interesting, it is mostly speculative since there is still no empirical evidence in favor of the compensatory skills model. Moreover, the generally low pre-test scores on the process measures do not support this hypothesis. Overall, the fact that some decreases on the process measures were

also observable for participants who received ET may suggest that the mechanisms involved in both CT and ET may share some similarities.

Results from the present study have great implications for cognitive behavioral models of OCD. Thus, targeting exclusively idiographic assumptions and attitudes regarding excessive responsibility, perfectionistic tendencies and overestimation of danger would produce significant decrease of checking behaviors. This gives a direct empirical test for the theoretical link between responsibility, perfectionism and perceived threat and checking compulsions (e.g., Salkovskis, 1985, 1989, 1995; Ladouceur, Freeston, & Rhéaume, 1996). In a recent article, we proposed that there is at least five distinct ways by which OC patients appraise their intrusive thoughts (Freeston, Rhéaume, & Ladouceur, 1996). Excessive responsibility, perfectionism and overestimation of danger were three of them. We suggested that although several cognitive targets may be present at the same time for one patient, an idiographic approach would facilitate the ponderation of each target. In the present study, although both excessive responsibility and perfectionistic tendencies were identified in all patients, the proportion of each was different for every patient and sometimes varied as a function of different compulsions.

The present study demonstrates that pure cognitive therapy may be effective with compulsive checkers. This is the second time that CT without any behavioral technique was successfully used with OC checkers (e.g., Ladouceur, Léger et al., 1996). Comparatively to van Oppen et al.'s study, no behavioral experiments were allowed in the CT condition, to ensure that habituation to anxious symptoms could not explain the decrease in compulsions. However, selective specific behavioral experiments are well known as exercises that can contribute to discarding irrational beliefs (Salkovskis, 1995a; van Oppen et al., 1995). In such cases, the patient is

challenged to empirically test specific beliefs in real situations. There are practically no limits to the variety of behavioral experiments with OC patients (for some examples, see Freeston, Rhéaume & Ladouceur, 1996). Using these behavioral tests may represent a more complete way of doing cognitive therapy (Beck & Weishaar, 1989; Salkovskis, 1995b).

We obtained particularly successful results with Exposure Therapy in this study, as reflected by both the self-rating data and the low post-test scores on the Y-BOCS for the 3 participants. Indeed, all three participants' Y-BOCS post-test scores were below 10, which is considerably low when considering that mean scores at post-test was 17.9 for patients from the self-controlled exposure condition in van Oppen's study (van Oppen et al., 1995). Note that 16 is the usual point of entry in OCD drug studies (Frost, Krause, & Steketee, 1996). This may be due to at least three factors: (1) the treatment combined therapist and self-instructed in vivo exposure which may have maximized the integration of exposure; (2) two sessions a week during the first half of treatment and a total of 24 sessions represent an optimal package, allowing consistent supervision for practicing exposure at the beginning of treatment and providing enough time to generalize the strategies to most of the threatening situations; and (3) Exposure Therapy was presented to the patients within a behavioral model of OCD, offering patients a clear schematic explanation for their disorder that may have considerably dedramatized their fears and facilitated their acceptance of exposure and response prevention therapy. Together, these factors may have all contributed to the success of Exposure Therapy in eliminating most or all checking behaviors for the three participants at the end of therapy.

Although the main complaints were checking behaviors, some patients also reported washing and other types of compulsions that were not main

treatment targets for either treatment. These symptoms were also measured by the PI and the CAC, and mostly remained unchanged after treatment, which may partially explain the absence of significant change for some participants on these instruments. One should expect a lack of generalization between checking and washing compulsions since they address different concerns and would operate through different mechanisms (Rachman & Hodgson, 1980; Rachman, 1971; Watts, 1995; Steketee, Grayson, & Foa, 1985).

Although pure cognitive therapy was effective with checking behaviors in this study, a replication with other forms of compulsive patients needs to be carried out in order to generalize results obtained with this specific form of CT. Some authors have recently highlighted the heterogeneity of OC patients, and how it may limit the generalization of results across studies (e.g., Rachman, 1994a; Enright, 1996; Pigott, Meyers, & Williams, 1996; Tallis, 1996). Most studies have overincluded checkers and washers, to the detriment of other forms of compulsions, ruminations and combined compulsions (Ball, Baer & Oto, 1995). It has been suggested that classifying OC patients according to symptom content may not be valid, and a speculative typology has even been proposed (Pigott, Meyers, & Williams, 1996). To date, little is known about how distinct subgroups of OC patients may benefit from cognitive-behavioral treatment. However, in a recent trial, significant results were obtained using pure CT within a case formulation approach with ruminators (Léger, Freeston, & Ladouceur, 1996). The problems related to generalization are even more complex when considering the large variability that may exist within a same category of patients. This was nicely depicted by Rachman (1994b) who recently described three different cases of compulsive washers who were preoccupied with distinct concerns. Tallis (1996) even proposed a fourth one. Overall, this

calls for the use of continuous assessment to capture subtleties of the clinical picture of this population.

At this point, we are confident that correction of idiographic distorted assumptions concerning the ideas of responsibility, perfectionism and perceived danger can successfully decrease checking compulsions, anxious state and depressive symptoms. Until now, clinicians have relied most exclusively on exposure and response prevention to treat OCD. Correcting specific cognitive distortions has proved to be effective in decreasing checking compulsions and may represent an alternative approach for some patients. The similar treatment credibility scores obtained for both treatment conditions suggest that CT is judged to be as logical and effective as ET in the treatment of OC symptoms. This suggests that neither exposure nor response prevention need to be presented to the patient as a pre-requisite for successful relief of OC symptoms. Moreover, used in combination with exposure and response prevention, CT may constitute a more comprehensive method for patients. Thus, the patient must not only confront threatening situations to habituate to anxiety, but test whether feared expectations really occur when not performing rituals (van Oppen et al., 1995).

Finally, one should recommend the replication of these results in a controlled study to statistically address the question of which treatment is more effective with OCD. However, we believe this under-taking to be extremely money and time-consuming, considering it would require approximately 60 participants in each condition in order to gain enough statistical power to find a significant effect (Freeston, Ladouceur, & Bouchard, 1996), especially if the control treatment is the gold standard form of ET. At this point, two questions seem more interesting from our point of view. The first concerns the generalization of these results with other subtypes of OC patients. The second

is related to the mechanism of change that occurs during cognitive-behavioral treatment of OC patients.

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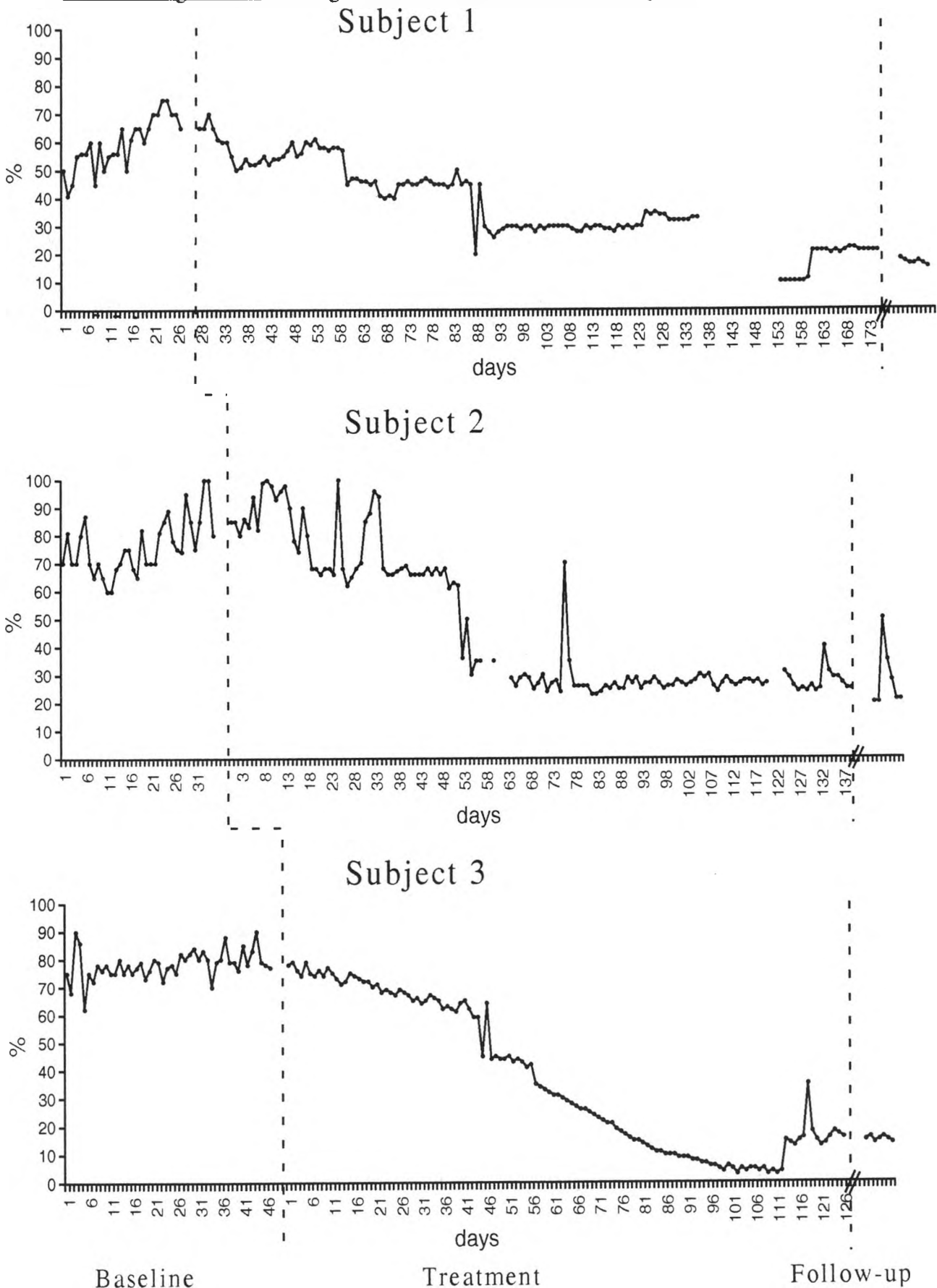
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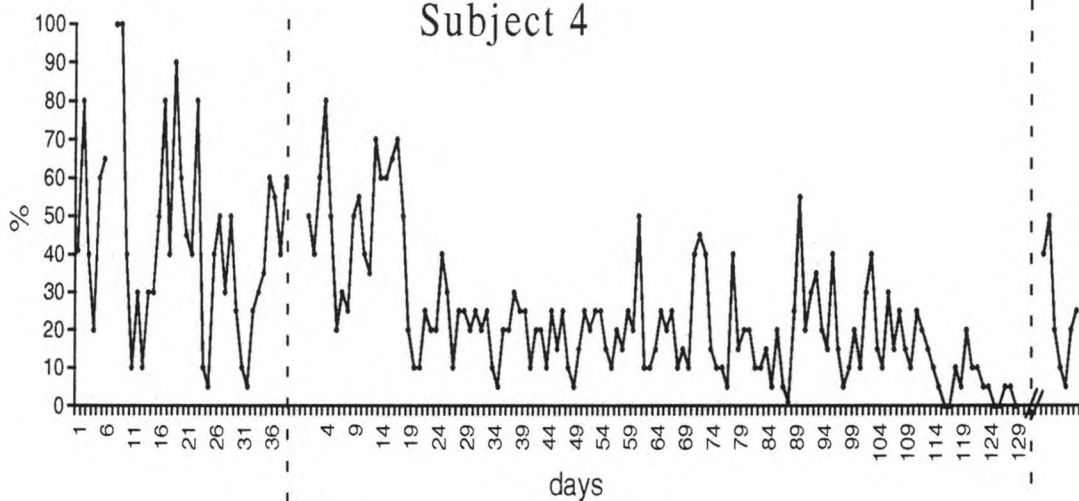
Correspondence to Josée Rhéaume, Ecole de psychologie, Université Laval, Québec, CANADA, G1K 7P4.

Figure 1
Self-rating of Checking Interference for each subject.

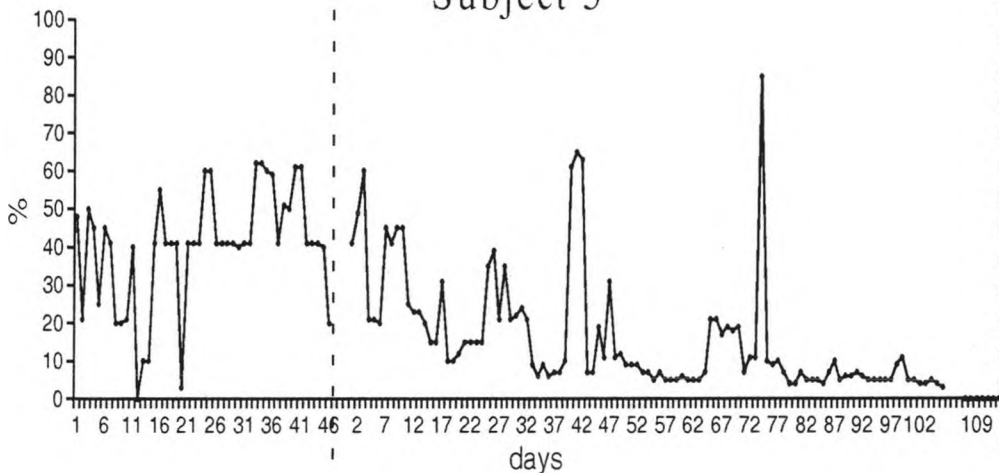


Self-rating of Checking Interference for each subject.

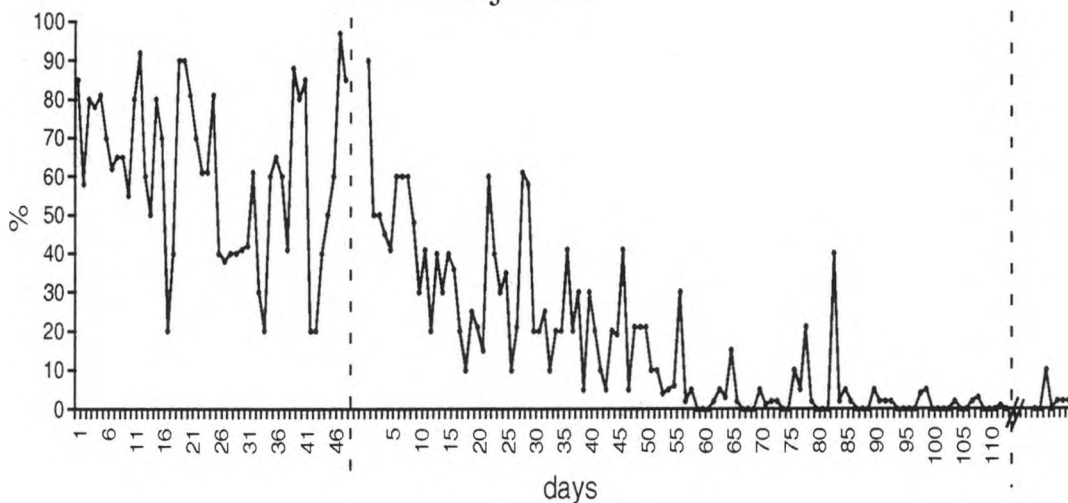
Subject 4



Subject 5



Subject 6



Baseline

Treatment

Follow-up

Table 1

ADIS-III-R severity scores, comorbidity and duration of illness for participants from both conditions

Patient	Pretreatment scores				
	ADIS-R severity	Secondary diagnoses	YBOCS Score	Duration of illness	Medication
Cognitive Therapy					
Patient 1	7	Social phobia (sev:4)	21	4 years	none
Patient 2	8	Social phobia (sev:4) GAD (sev:4) Dysthymic disorder (6)	35	5 years	yes
Patient 3	7	Simple phobia (sev:6)	20	4 years	none
Exposure Therapy					
Patient 4	7	none	19	15 years	yes
Patient 5	8	none	22	15 years	yes
Patient 6	8	Major depression (sev:4)	30	20 years	none

Table 2
Results of Time-Series Analysis on Interference caused by checking

Parameter	Value	SD	t
Patient 1			
Baseline ^b			
Constant ^a	58.08	1.16	50.04***
Including the intervention ^b			
Constant ^a	-.06	.17	-.36
W ^a	2.42	1.57	1.55
D ^a	-.81	.17	-4.74***
Patient 2			
Baseline			
Constant ^a	3.19	3.08	1.03
MA ₁ ^a	1.00	.09	10.74***
AR ₁ ^a	.97	.04	26.05***
Including the intervention			
Constant ^a	4.39	.71	6.20***
W ^a	-2.73	.37	-7.44***
MA ₁ ^a	.65	.07	9.71***
AR ₁ ^a	.96	.01	123.53***
Patient 3			
Baseline ^b			
Constant ^a	77.40	.71	108.74***
MA ₁ ^a			
Including the intervention ^b			
Constant ^a	.01	.25	.02
W ^a	-1.23	.49	-2.51**
D ^a	.98	.01	118.88***
MA ₁ ^a	.60	.06	9.37***

^aAfter outlier adjustment; ^bNecessitate a differencing; W: level change; D: slope change; **p<.01; ***p<.0001.

Table 2 (continued)

Parameter	Value	SD	t
Patient 4			
Baseline			
Constant	32.91	7.99	4.12***
AR ₁	.28	.16	1.82*
Including the intervention			
Constant ^a	18.87	3.62	5.21***
W ^a	-12.19	2.90	-4.20***
AR ₁ ^a	.63	.06	10.01***
Patient 5			
Baseline			
Constant	7.43	5.03	1.48
AR ₁	.48	.12	3.86***
AR ₄	.29	.13	2.33*
Including the intervention			
Constant	13.22	3.89	3.40***
W	-8.60	3.16	-2.72**
AR ₁	.47	.08	6.04***
AR ₄	.14	.08	1.77*
Patient 6			
Baseline			
Constant ^a	37.45	8.48	4.41***
MAg ^a	-.25	.13	-2.00*
AR ₁ ^a	.33	.13	2.49**
Including the intervention			
Constant	39.01	4.95	7.89***
W	-1.54	.41	-3.80***
D	.96	.01	99.63***
MAg	-.18	.08	-2.24*
AR ₁	.28	.08	3.65***

^a After outlier adjustment; W: level change; D: slope change; *p<.05; **p<.01; ***p<.0001.

Table 3

Individual scores on the measures of OC symptoms before treatment, after treatment and at six month follow up and clinical significance

Participant	Pre-test	Post-test	Follow up	Clinical significance	
				Post-test	Follow up
Y-BOCS					
1	21	12	11	*	*
2	35	11	11	*	*
3	20	9	8	*	*
4	19	5	13	*	*
5	22	5	-	*	-
6	30	9	11	*	*
PIa					
1	33	15	17	*	*
2	74	38	50	ns ^a	ns ^a
3	40	16	13	*	*
4	24	11	21	*	*
5	93	-	77 ^b	-	ns
6	104	4	33	*	ns ^a
CAC					
1	4	0	2	*	ns
2	14	9	-	ns	-
3	5	0	0	*	*
4	5	3	7	ns	ns
5	26	-	23 ^b	-	ns
6	25	0	0	*	*

* = $p < .05$.

Y-BOCS = Yale-Brown Obsessive-Compulsive Scale, PIa = Padua Inventory abridged version, CAC = Compulsive Activity Checklist.

^a : Although post-test score was still in the clinical range, the rc index was significant indicating that the change was real.

^b : for this patient, data from follow up were obtained by phone approximately 9 months after the end of treatment.

Table 4

Individual scores on the measures of general functioning before treatment, after treatment and at six month follow up and clinical significance

Participant	Pre-test	Post-test	Follow up	Clinical significance		
				Post-test	Follow up	
BAI						
1	9	7	9	ns	ns	
2	21	6	19	*	ns	
3	8	8	9	ns	ns	
4	3	1	6	ns	ns	
5	23	-	31 ^b	-	ns	
6	29	3	7	*	*	
BDIa						
1	5	1	5	*	ns	
2	27	7	18	*	ns	
3	6	2	1	*	*	
4	1	1	4	ns	ns	
5	7	0	-	*	-	
6	25	0	0	*	*	

* = $p < .05$.

BAI = Beck Anxiety Inventory, BDIa = Beck Depression Inventory abridged version.

^b : for this patient, data from follow up were obtained by phone approximately 9 months after the end of treatment.

Table 5

Individual scores on the process measures before treatment, after treatment and at six month follow up and clinical significance

Participant	Pre-test	Post-test	Follow up	Clinical significance	
				Post-test	Follow up
R-S ^a					
1	68	64	60	c	c
2	65	45	54	c	c
3	54	41	49	c	c
4	45	43	45	c	c
5	106	-	-	-	-
6	108	62	67	ns	ns
RQ					
1	59	57	62	c	c
2	91	72	77	ns	ns
3	52	45	28	c	c
4	50	59	53	c	c
5	109	-	-	-	-
6	96	46	-	*	-
PQ ^{ab}					
1	103	77	93	c	c
2	92	83	89	c	c
3	75	55	55	c	c
4	97	67	95	c	c
5	147	-	-	-	-
6	160	61	56	*	*

* = $p < .05$. R-S = Responsibility Scale, RQ = Responsibility Questionnaire, PQ = Perfectionism Questionnaire. Cut scores were 69.12 for the R-S, 66.15 for the RQ and 132.32 for the PQ.

^a : RC index were not calculated for this instrument since no test-retest correlation was available.

^b : One standard deviation over the nonclinical mean score was used as a criteria for clinical significant change since no norms were available for the clinical population on this instrument.

^c : Score already in the nonclinical range at pretest.

Table 6

Endstate functioning on the obsessive compulsive measures

	Endstate functioning			
	Post-test		Follow up	
	CT	Exposure	CT	Exposure
Y-BOCS	3	3	3	2*
IP	2	2*	1	1
CAC	2	1*	1	1
On a min of two measures ^a	2	2*	2	2
On all three measures	2	1*	1	0

^a Patients who scored in the nonclinical range after treatment on at least two measures were judged as having a high endstate functioning.

* Missing data for Patient 5

Table 7
Treatment credibility and expectancies for improvement

Patient	Treatment credibility		Number of checking anticipated	
	<u>Pre-test</u>	<u>Post-test</u>	<u>Pre-test</u>	<u>Post-test</u> ^a
CT				
1	21	24	10/week	10/month
2	25	28	10/day	10/month
3	24	24	10/month	10/month
ET				
4	-	23	-	10/week
5	23	30	10/week	none
6	28	30	10/year	none

^a Here the patient was asked how many exaggerated checking he or she expected to do for the next three months.

- : missing data.

DEUXIÈME PARTIE

UN EXAMEN DU CHANGEMENT COGNITIF INDIVIDUEL

Résumé

Un nombre restreint mais grandissant d'études ont traité de la question de la relation entre les cognitions erronées et les symptômes Obsessionnels-Compulsifs (OC). La plupart des défenseurs des modèles cognitifs s'accordent sur l'idée que la façon dont les patients OC évaluent leurs pensées intrusives les amènent à utiliser des compulsions. Au contraire, d'autres ont suggéré que les cognitions des patients seraient des rationalisations a posteriori pour leurs neutralisations. Cette étude examine les changements cognitifs individuels durant un traitement cognitif des compulsions de vérification en utilisant l'analyse Multivariée de Séries Chronologiques (MSC). Nous avons aussi vérifié si des changements cognitifs similaires se produisent durant un traitement standard d'exposition et de prévention de réponse. Quatre variables sont cotées quotidiennement par les participants durant tout le traitement: (1) une croyance sur la responsabilité, (2) une tendance perfectionniste, (3) la gravité des conséquences perçue si la vérification n'est pas effectuée et (4), l'interférence causée par les vérifications. Les résultats montrent que pour 2/3 patients dans la condition cognitive, et pour les 3 patients de la condition exposition, des changements sur au moins une cognition précèdent la diminution des symptômes. Pour 4/5 patients, une diminution de symptômes précède également un changement cognitif à un moment durant le traitement. D'autres ont trouvé que l'exposition amène certains changements cognitifs (e.g., Ito, Araujo, Hemsley, & Marks, 1995). La présente étude suggère qu'au moins un des mécanismes impliqués durant les deux formes de traitements implique la précérence d'un changement cognitif sur la diminution des symptômes. Les résultats appuie la présence d'un autre mécanisme, incluant la précérence d'un changement de symptômes sur le changement cognitif. Les implications théoriques et cliniques sont discutées.

Cognitive treatment and behavioral treatment of checking behaviors. Part 2.

An examination of individual cognitive change.

Josée Rhéaume and Robert Ladouceur

Ecole de Psychologie, Université Laval, Québec, CANADA

Running Head: COGNITIVE CHANGE IN COMPULSIVE CHECKERS

Abstract

A restricted but growing number of studies have addressed the question of the association between erroneous cognitions and Obsessive-Compulsive (OC) symptoms. Most tenants of cognitive models agree that the way OC patients evaluate their intrusive thoughts leads them to use compulsions. On the contrary, others have suggested that patients' cognitions would be post hoc rationalizations for their irrational neutralizing. This study examined individual cognitive change during successful cognitive therapy of compulsive checking using Multivariate Time Series (MTS) analysis. We also verified if similar cognitive changes occurred during a standard treatment of exposure and response prevention. Four variables were recorded daily by participants during treatment: (1) belief about responsibility, (2) perfectionistic tendency, (3) perceived severity of outcome if checking not performed and (4) Checking Interference. Results show that for 2/3 of patients in cognitive therapy and all 3 patients in the exposure treatment, change on at least one cognitive variable preceded the decrease of checking. For most patients, some change in symptoms also preceded cognitive change at some point during treatment. Others have found that exposure would result in some cognitive change (e.g., Ito, Araujo, Hemsley, & Marks, 1995). The present study suggests that at least one mechanism involved during both CT and ET for OCD would involve the precedence of belief change over symptoms. Results also raise some evidence for another mechanism, which would include the precedence of symptom change over cognitions. Theoretical and clinical implications are discussed.

Cognitive treatment and behavioral treatment of checking behaviors. Part 2.

An examination of individual cognitive change

The development of behavior (e.g., Bandura, 1977; Meichenbaum, 1977) and cognitive (e.g., Ellis, 1973; Beck, 1976) theories have emphasized the potential contribution of cognitions in both anxious and mood disorders. It is now fairly recognized that cognitions, as crucial mediators of emotions and behaviors, need to change in order to have some lasting effect on emotions and behaviors (Wessler, 1987).

Despite this claim for the contribution of cognitive factors in emotional disorders, cognitive-behavioral treatments have often failed to demonstrate significant change on measures of cognitions after successful treatment for both depressive and anxious disorders (Beckham & Watkins, 1989). This may reflect methodological problems, such as difficulties operationalizing cognitions across studies. Indeed, there are different types of cognitions and there is no consensus on what level may be more important in explaining psychopathology (Goldberg & Shaw, 1989). Researchers also disagree on the methods to be used in measuring these different types of cognitions. While cognitive products (e.g., beliefs, attributions, temporary assumptions) may well be captured by self-report, structure and process variables (e.g., appraisals, schemas, basic assumptions) may better be measured by information processing tasks. For a review on information-processing approaches with compulsive checking, see Watts (1995). It has been suggested that self-statement measures may not be reliable for cognitive schemas, since this material would not be accessible to the patient's consciousness while answering self-report (Arnkoff & Glass, 1982). To counter that limitation, others have suggested triggering the dysfunctional schema before measuring cognitions. Overall, these examples

illustrate a more general problem related to the fact that behavioral changes are more accessible and easier to measure than cognitions and their fluctuations (Rachman, 1996).

Some authors have pointed out that in order to confirm the cognitive treatment mechanism, pre-treatment to post-treatment comparisons should be made on the cognitive assessment instruments as well as symptoms measures (e.g., Kendall & Korgeski, 1979). A restricted but growing number of studies on OCD have addressed the question of whether a decrease in erroneous cognitions is associated with a decrease of symptoms. In a clinical study comparing Cognitive Therapy to Exposure alone on OC patients, only patients in Cognitive Therapy showed a significant decrease on the Irrational Belief Inventory after treatment (van Oppen, de Haan, van Balkom, Spinhoven, Hoogduin, Dyckenson, 1995). However, post-test mean scores were still high for both groups, suggesting the magnitude of change on cognitions was low. In another study using the information processing paradigm, Foa & McNally (1986) demonstrated that OC patients show better detection of fear-relevant words than neutral words on a dichotic listening task before treatment, but not after treatment. This suggests that treatment has an impact on this cognitive bias. Recently, Freeston and colleagues showed that contrarily to general beliefs, post-treatment scores on the Irrational Beliefs Related to Obsessions inventory were found to be significantly correlated with clinical improvement for 29 pure obsessionals (Freeston, Ladouceur, Gagnon, Thibodeau, Rhéaume, Letarte, & Bujold, 1997). In a single case study with four OCD checkers, some patients spontaneously reported less severe negative outcomes resulting from hypothetical ambiguous idiographic OC situations after treatment (Freeston, & Ladouceur, 1995). However, decrease on global cognitive measures were less apparent. This is consistent with another study on checkers, where clinical

change on cognitive measures were less obvious than the decrease in OC symptoms per se (Ladouceur & Rhéaume, 1997). Although modest, both factorial and correlational designs have shown significant cognitive changes in OC patients following successful cognitive-behavioral treatment. Overall, better results have been obtained using more specific self-statements, compared to general irrational beliefs. What these studies tell us is that cognitive change is associated with cognitive behavioral treatment. What they do not tell us is whether cognitive change precedes or follows the reduction in symptoms.

Although most authors agree on the importance of cognitive change, there is still a debate on its role during therapy and how to best affect such change (Arkowitz & Hannah, 1989). Cognitive therapy sees cognition as primary and tries to change cognitions by providing new experiences and through the use of more purely cognitive techniques. Behavior therapists who rely on a social learning perspective see cognition as one mediating factor in a continuous behavior-cognition-environment loop and emphasize providing the patient with new experiences as the method of changing cognitions. The recognition of the implication of cognition in psychopathology has raised a further debate between behaviorists and cognitivists which Wessler has clearly depicted:

"Most approaches to cognitive-behavioural therapy agree (...) that cognitions must change in order for enduring behavioural changes to occur. Some behaviourists argue that cognitions are epiphenomenal rationalizations to explain behaviours that are determined by reinforcement; behaviours must change in order for cognitions to change (...). Cognitive-behavioural approaches, then, can be seen as having a chicken-and-egg dilemma. " (Wessler, 1987, p. 25)

This disagreement is also present in the OCD literature, where most tenants of cognitive models (e.g., Salkovskis, 1985; 1996a; Freeston & Ladouceur, in press; Ladouceur, Freeston, & Rhéaume, 1996) agree that the way people evaluate their intrusive thoughts (for example, in function of excessive responsibility) produces discomfort and leads them to use compulsions. On the contrary, others (e.g., Enright, 1996) have suggested that patients' excessive responsibility may be a post hoc rationalization for their irrational neutralizing, having little to do with causing the symptoms. Finally, for others, even if cognitions are the mechanisms responsible for therapeutic change, it has to be conceded that cognitions can be removed as effectively by indirect non-cognitive methods as by Cognitive-Behavioral Therapy (e.g., Rachman, 1996).

Direct examination of the mechanisms of change during CT is quite limited as researchers are only beginning to test the primary premise of CT (Beckham & Watkins, 1989). One possible reason for the lack of process studies is that debates concerning the primacy of cognitive or behavior change have focused almost exclusively on treatment response, to the detriment of process variables (Salkovskis, 1996b). Moreover, the fact that most of the actual designs rely mainly on pre and post-test scores on general measures does not encourage the examination of the relationships between the process variables.

One more parsimonious way of studying the process of change in therapy may be by using continuous measurement of the key variables through time. As Rachman (1996) states for panic disorder:

"If the reductions in negative cognitions are no more than correlates of panic reduction, or if the cognitive changes follow rather than precede the reduction of panic, we need to study the sequence of events with care" (p. 15).

Some empirical evidence for the precedence of change in cognitions over panic apprehension has been obtained lately with daily measurement of both key cognitions and symptoms (Bouchard, Gauthier, Nouwen, Ivers, & Vallières, 1996). In a recent study using a single case methodology, Freeston & Bouchard (1995) have demonstrated that the decrease in obsessions was directly followed by a decrease in negative interpretations for a patient suffering from aggressive obsessions. However, they did not find a significant effect in the opposite direction. The precedence of cognitive change over symptoms then still remains to be empirically demonstrated for OCD.

The purpose of this study was to extend the results from a previous study where both pure cognitive therapy and exposure therapy were found statistically and clinically significant for compulsive checking (Ladouceur & Rhéaume, 1997). The present study investigates the mechanisms of individual cognitive change during successful Cognitive Therapy (CT) of OCD using Multivariate Time Series (MTS) analysis. We also verified if similar cognitive changes occur during a standard treatment of exposure and Response Prevention (ET). We hypothesized that the cognitive change would precede change in checking behavior for the patients in CT, because the intervention directly focused on these beliefs. For patients in ET, we expected cognitive change to follow change in symptoms, since exposure and response prevention targeted the reduction of compulsions.

Method

Participants and procedure

Six patients suffering from compulsive checking participated in the study. Two single case multiple baseline designs across subjects were used with baseline ranging from 30 to 50 days. The participants were randomly assigned

to either CT or ET. For a complete description of participants, methodology, and treatment content, see Ladouceur & Rhéaume (this chapter). Self-rating data from the six patients were analyzed with the SCA statistical system for Multivariate Time Series (MTS) Analysis (Hudack, Liu, Box, Hiller & Tiao, 1991).

Time-Series

Checking Interference. The interference caused by checking behaviors was evaluated daily by participants throughout all treatment. This variable was chosen because it reflects all checking behaviors as opposed to time spent on one particular ritual (see Ladouceur & Rhéaume, this chapter).

Cognitions. Participants evaluated daily the extent to which they believed in: (1) a personal statement on responsibility, (2) a perfectionistic tendency, and (3) danger occurring if compulsion not performed. Beliefs were selected according to the patients' highest scores on different questionnaire items that had then been reformulated in a personalized way.

Results

Model building

Data were analyzed using Multivariate Time Series analysis; more precisely the vector autoregressive and moving-average (V-ARMA) modeling technique. For all but one participant¹, the series of daily self-monitored observations from first day of treatment to the end of the intervention were submitted for the analysis. Four series were included in the model building of each patient; one for the OC symptoms (Checking Interference) and three for the cognitions (responsibility, perfectionism and danger). As showed in Figure 1, all four series of the six patients decreased over the course of treatment.

Insert Figure 1 here

Table 1 depicts the summary of the ARMA models for each patient, with diagnostic indicators of model adequacy. We used the Schwarz's Bayesian Criterion (SBC; Lütkepohl, 1985) and the residuals exceeding the critical chi-square value.

Insert Table 1 here

Although an adequate model was obtained for each patient, several models were very complex. Indeed, all but two models necessitated the presence of at least three orders autoregressive matrices. This may reflect the combination of four series in the model, which can complicate the analysis in V-ARMA modeling (Haynes, 1992).

Precedence testing

Analyses were conducted to evaluate if the decrease of each patient's beliefs significantly preceded a decrease in Checking Interference. A complete description of the results is presented in Table 2 and a summary is depicted in Figure 2. Results show that for all patients but one, Checking Interference on a specific day was related to the Checking Interference on a previous day and the strength of beliefs on the previous day. Results reveal that beliefs preceded Checking Interference for 2 out of the 3 patients in CT (all but participant 3) and for all 3 patients in ET. In order to allow a potential reciprocal interaction, the impact of Checking Interference on beliefs was also tested. Results show that

the decrease in checking preceded a decrease of at least one belief for all but one patient in ET (patient 4).

Insert Table 2 and Figure 2 here

Discussion

The general aim of the present study was to verify whether specific cognitive change occurs during CT and ET for compulsive checking. The observation of the series representing cognitive variables for the six patients showed that all series tend to decrease over the course of therapy. However, some series seem to decrease more than others. Interestingly, the series of patients in ET decreased as well. Both treatments were associated with a decrease in beliefs, suggesting that both forms of interventions involve some change in cognitions, at least when treatment is successful.

A second goal of the study was to empirically test the precedence of cognitive change over OC symptoms. MTS analysis was carried out on the four variables for each patient to test whether cognitive change preceded the decrease of Checking Interference. Results show that for 2/3 of patients in CT and all 3 patients in ET, change on at least one cognitive variable preceded the decrease of Checking Interference at some point during treatment. We used pure cognitive therapy with four OC patients and observed clinically significant decreases of their compulsive checking, suggesting that cognitive change was responsible for the reduction in symptoms (Ladouceur, Léger, Rhéaume, & Dubé, 1997). Moreover, others have found that exposure would involve some cognitive change (e.g., Ito et al., 1995; Lelliott, Norshirvani, Basoglu, Marks, & Monteiro, 1988; van Oppen et al., 1995; Freeston &

Bouchard, 1995). The present study suggests that at least one mechanism involved during both CT and ET would involve the precedence of belief change over symptoms.

The impact of Checking Interference on cognitions was also tested. Results show that the decrease in checking preceded the decrease of a belief for all but one patient in ET at some point during therapy. The fact that it happened for most patients in ET is coherent with Rachman's vision of safety acquisition through exposure (1996). He suggested that the patients would accumulate disconfirmatory evidence during exposure which would have an impact on their distorted beliefs. However, the similar pattern obtained in all patients in CT is contrary to our initial hypothesis. Since two of them (patients 1 and 2) also showed a significant precedence of cognition over symptoms, this may reflect the retroactive interaction often involved in the process of therapeutic change (see Bandura, 1986). More surprisingly, it was the only significant link for Patient 3. One plausible explanation may concern the potential impact of the cognitive model of OCD presented to the patients in CT, which may have served as a reassurance for this patient, spontaneously exposing herself early in treatment.

Taken together, these results support the cognitive-behavioral models of OCD, whereby specific cognitions have been stipulated to be linked to the development and maintenance of OC symptoms (e.g., Salkovskis, 1985; Freeston, & Ladouceur, in press; Ladouceur, Freeston, & Rhéaume, 1996). However, considering the few numbers of participants and since significant bidirectional temporal links were found for most patients from both conditions, these results do not support our hypotheses concerning the first variable to change during treatment. Others have found reciprocal determinism, using MTS, with cognitive variables and apprehension of panic

attacks (e.g., Bouchard et al., 1996) and worry (Dugas, Ladouceur, & Rhéaume, 1997). Replicating this study with larger groups may allow the detection of some trends between patients from both conditions. Moreover, using a longer period of self-rating data would permit to carry out precedence tests at different points of time during treatment, which may facilitate the detection of which variable really precedes the other, when bidirectional links are present for a participant.

An examination of individual results shows a wide range of patterns according to both the number of cognitions that were significantly related to symptom change and the direction of the temporal links. This suggests that the cognitive pathways by which the individuals may change their distorted beliefs is highly idiosyncratic. Thus, the three cognitions were involved in up to five different ways with the symptoms for some patients (e.g., Patient 5), whereas only few significant associations were observed for others (e.g., Patient 1). One could also infer that other cognitive variables that were not measured in the present study may play a significant role as well. In a recent article, it has been proposed that OC patients evaluate their intrusive thoughts as a function of at least five distinct faulty appraisals (Freeston, Rhéaume, & Ladouceur, 1996). Overestimation of danger, excessive responsibility and perfectionistic tendencies were three of them. Moreover, the overimportance given to both the presence or content of the intrusive thoughts would constitute a central cognitive therapeutic target for some cases. The overestimation of anxiety was the last distortion which, although not specific to OCD, may deserve specific attention in therapy with some patients.

Overall, patients in ET showed more cognitions involved in the process of symptom changes than patients in CT. Considering the few numbers of patients, it is not clear whether this difference is due to individual

differences or related to the treatments received. However, if replicated with more participants, this result suggests that although cognitive mechanisms are involved in OCD, the most efficacious way to modify them would be by using behavioral methods. This conclusion was nicely illustrated by Bandura's views on change in therapy in the following statement:

On the one hand, explanations of change processes are becoming more cognitive. On the other hand, it is the performance-based treatments that are proving more powerful in effecting psychological changes. This apparent discrepancy is reconciled by recognizing that change is mediated through cognitive processes, but that cognitive events are induced and altered most readily by experiences of mastery arising from successful performance. (1977, p. 79).

Results from the present study also have great methodological implications. MTS analysis has shown to be a powerful statistical tool to study the mechanism of change during the course of therapy. This method possesses numerous advantages: (1) MTS allows the empirical study of change process in a single participant through statistical determination of precedence of one variable over another; (2) it can simultaneously compare how several variables affect or are affected by other variables; and (3) it allows both idiographic and group comparisons. However, a considerable limit of this statistical method is that it cannot specify which one of two variables is the first to change, when bidirectional links are present.

Moreover, the application of the MTS methodology for social sciences still needs further empirical demonstration. Several variables need to be controlled in order to be more confident of the results obtained with this methodology. First, series from which analyses are carried out rely exclusively on self-rating data, which has been judged less reliable than more objective

measures (e.g., physiological measures, independent assessor rating). Second, it is not clear whether criteria used in self-rating of all the variables remain stable throughout therapy. Some patients may raise or decrease their criteria for severity during therapy which may not depict real change. Third, there may be a wide variability among patients in clearly understanding and efficaciously using self-rating in the daily assessment of both their symptoms and cognitions. Finally, some patients are more resistant to self-rating which leads to missing data that may render impossible the observation of real differences in the series.

Several guidelines have been recommended to maximize both adherence and comprehension of self-rating techniques by the patients (e.g., Meichenbaum & Turk, 1987), such as the importance of adapting the instructions to each patient. In order to control for change in criteria for severity, we would also recommend to systematically note the initial criteria in the notebook for each variable. The therapist may also ask participants to explain what their scores mean on each variable on a regular basis to make sure the patients still understand all the variables. Finally, one should minimize the number of variables submitted to self-rating in order to facilitate both adherence and comprehension.

This study demonstrates that cognitive change may be part of both pure cognitive and behavioral therapy. These results are coherent with results from studies with other forms of anxiety disorders where positive effects on cognitive measures were not exclusive to cognitive therapy (Chambless & Gillis, 1993). For example, similar decreases in negative cognitions were found in panic disorder patients (Margraf & Schneider, 1991) and claustrophobic patients (Booth & Rachman, 1992) who received pure cognitive or exposure therapy. Moreover, others have found decreases in negative cognitions after

successful treatment of panic with applied relaxation (Ost & Westling, 1995). Indeed, most controlled studies have found similar decreases in erroneous cognitions after other forms of treatments of panic disorder (e.g., Emmelkamp, Brillman, Kuiper, & Mersh, 1986; Williams & Rappoport, 1983), and social phobia (e.g., Heimberg, Dodge, Hope, Kennedy, Zollo, & Becker, 1990; Mattick & Peters, 1988).

More interestingly, this study shows that for most patients of both conditions, some specific cognitive change precedes change in symptoms, suggesting that at least one mechanism involved in the decrease of symptoms may be a shift in distorted cognitions. However, since the reverse relationship was also observable for most patients, we still are confronted with a chicken-and-egg dilemma. Distinct patterns were observable for all participants in terms of number of cognitions involved as well as the various links between them and the symptoms, suggesting this process would be highly idiosyncratic. Extensive studies will be needed to explore whether some factors according to the cognitions involved (e.g., number, type) may be associated with a better prevention of long term relapse.

Results of the present study show the presence of temporal links between cognitions and compulsive symptoms for all patients. The idea that a temporal precedence represents a necessary condition to infer causality between two variables is central in Haynes' (1992) elaboration of the preresquired conditions to assume causality in behavioral science. Among other prerequisites are the presence of a covariation between the theoretically linked variables, the need for the predictor variable to better account for the predicted variable than other variables, and most importantly, the presence of serial dependency within each variable. Although more strict conditions for the inference of causality have been proposed for serial data, such as the need

for the predictor variable to be both necessary and sufficient to explain the predicted variable, they would be too strict for the behavioral sciences considering that one variable is rarely sufficient to explain a psychopathology (Haynes, Spain, & Oliveira, 1993). Considering the limits of both designs and statistical techniques, researchers need to accumulate several indices before inferring causality. The precedence is certainly one of them. Controlled studies using group comparisons and manipulation of both cognitions and behaviors with repeated measures of each may represent the next step.

The present study gives supplementary support for the notion that negative cognitions can decline after a direct attack or after an indirect non-cognitive attack. Thus, Rachman (1996) suggested that during exposure, the patient may acquire fresh, disconfirmatory evidence that weakens the catastrophic cognitions. This explanation still does not solve the embarrassing question of whether a direct assault on cognitions is not more effective than indirect, incidental effects of exposure, nor can it explain why significant cognitive change can be observed following pharmacological treatment as well (e.g., Clark, Salkovskis, Hackmann & Gelder, 1991). These tricky questions remain to be empirically tested.

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Correspondence should be addressed to Josée Rhéaume, Ecole de psychologie, Université Laval, Québec, CANADA, G1K 7P4.

Footnotes

1 For participant 4, observations from last 50 days of treatment were eliminated from the analysis because at least one series was flat after the 10th week. In order to give enough span to conduct the analysis, data from baseline were also included, for a total of 88 observations.

2 As no results were significant for that participant, series were re-analyzed using Time spent for most important ritual as the symptom variable. Although results still showed no temporal precedence of beliefs on symptoms, a reciprocal effect was found for Responsibility ($X^2(1) = 11.35, p < .001$), for Perfectionism ($X^2(1) = 8.03, p < .005$) and for Danger ($X^2(1) = 10.6, p < .002$). At this point, it is not clear what these results means. First, this may reflect problems with self-rating, since at some points during therapy, this patient's scores on the self-rating were discordant with her own self-report concerning the interference caused by her checking. Second, it is possible that for this patient, another variable not measured here was responsible for decrease of checking. Third, the absence of any effect of beliefs on the decrease of symptoms may suggest that this patient has spontaneously exposed herself. However, this explanation would be improbable since when questioned about it, the patient attributed the success of therapy to the fact that it made her understand that the consequences resulting from not checking were less important and probable than she first thought.

Figure 1

Series of Beliefs and Checking Interference for each subject.

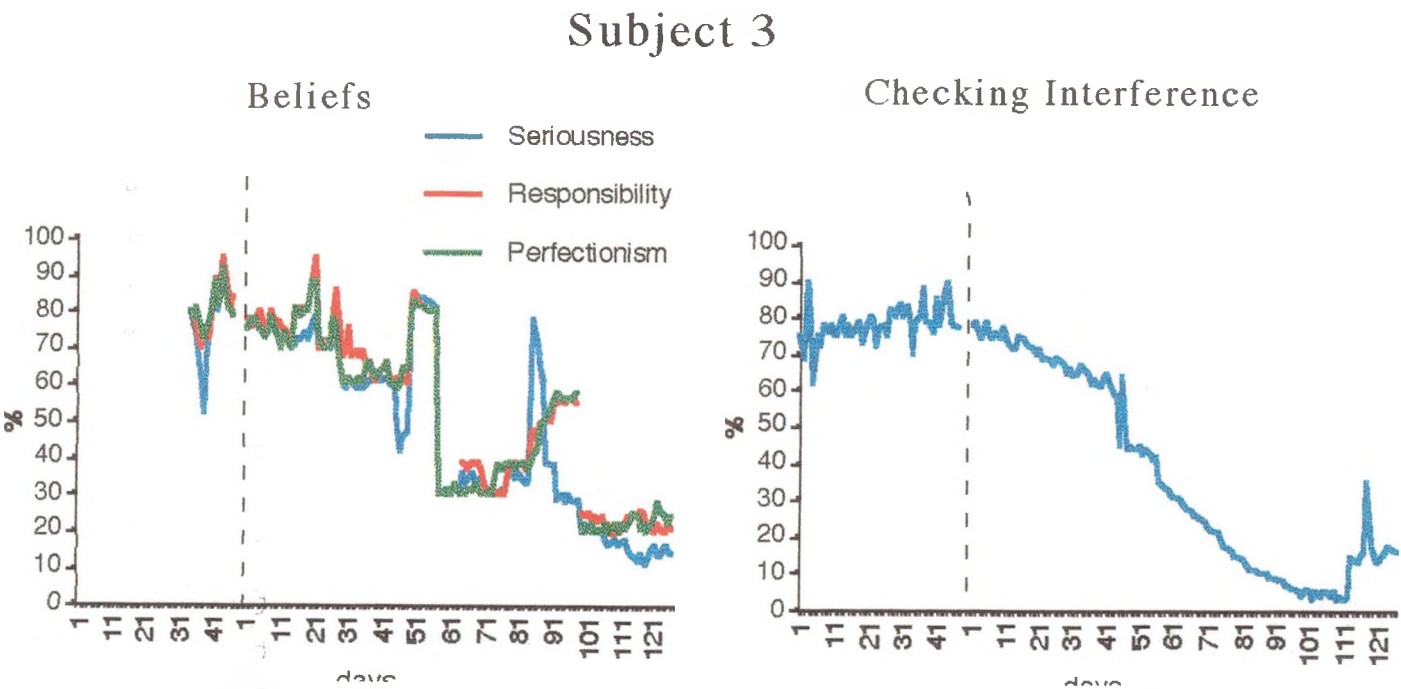
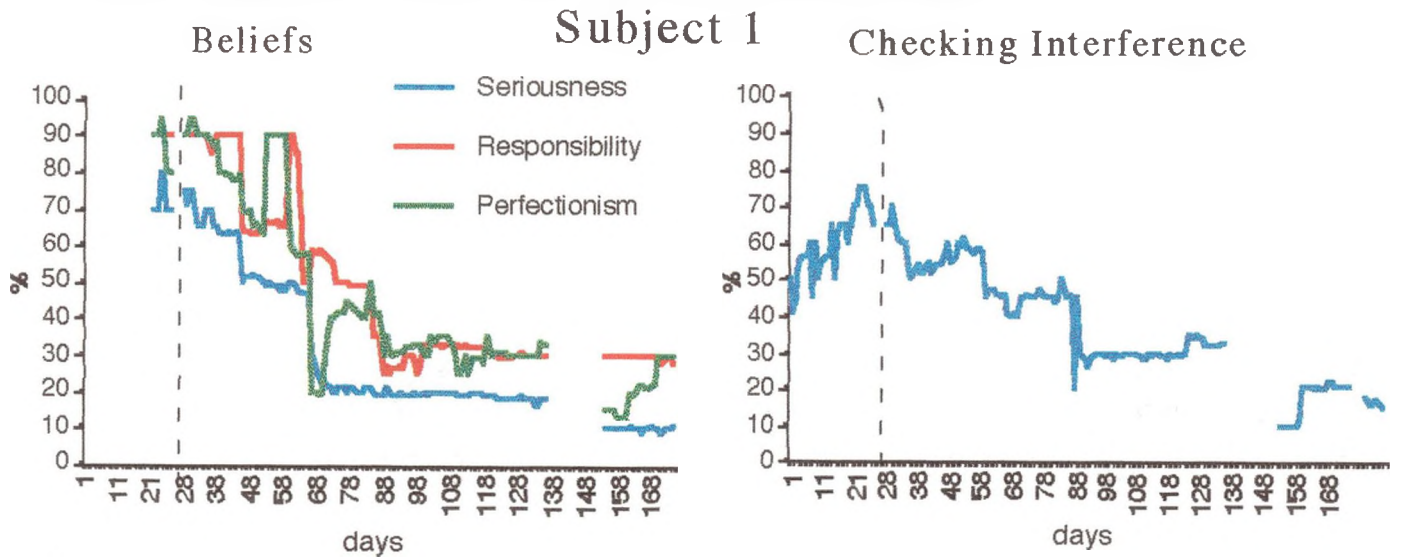
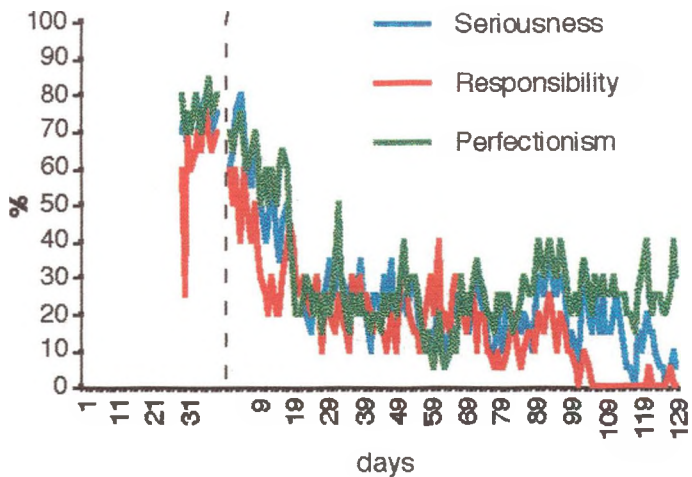


Figure 1 (continued)

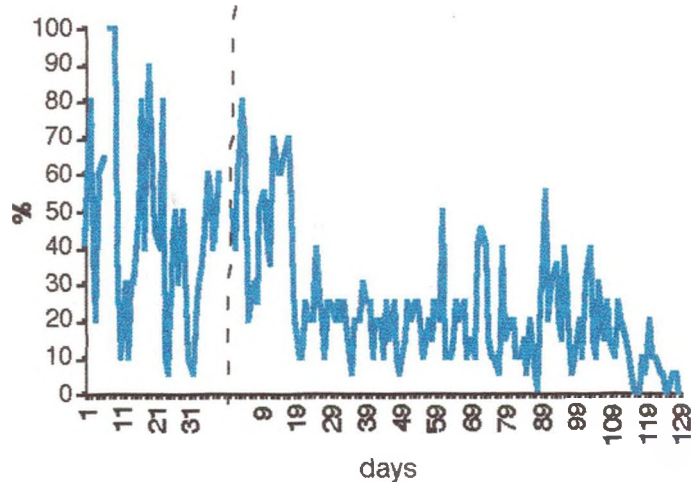
Series for Beliefs and Checking Interference for each subject.

Subject 4

Beliefs

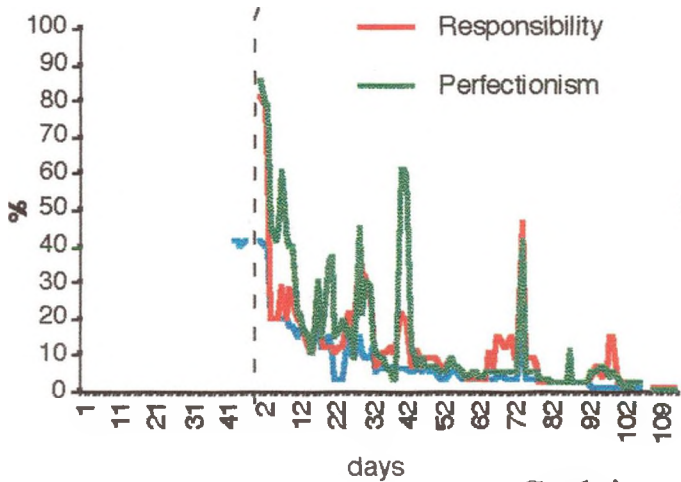


Checking Interference

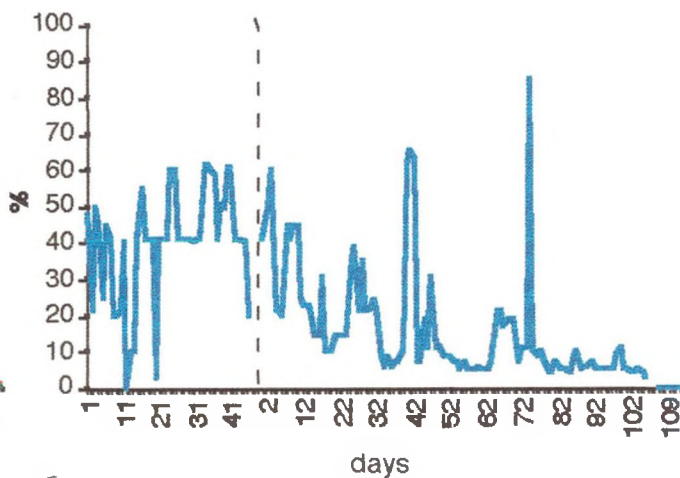


Subject 5

Beliefs

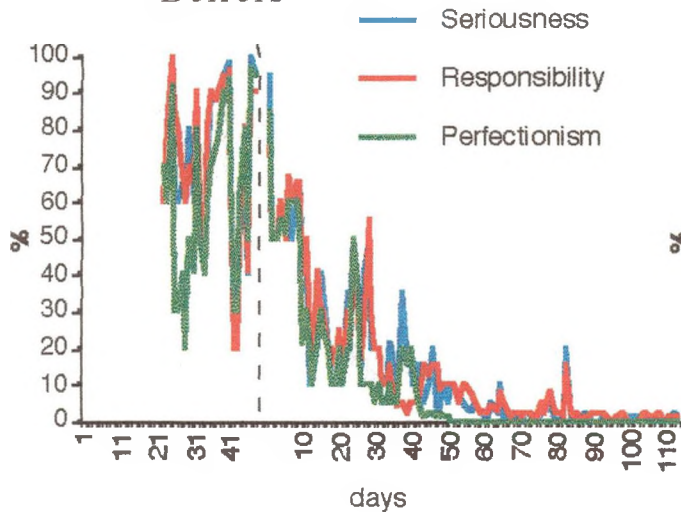


Checking Interference



Subject 6

Beliefs



Checking Interference

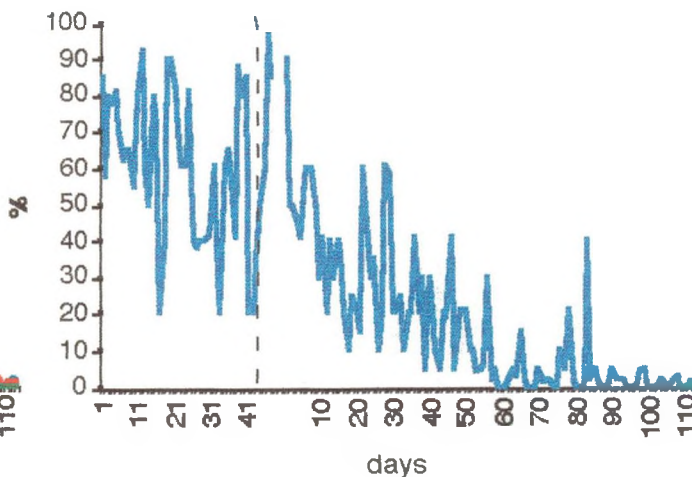
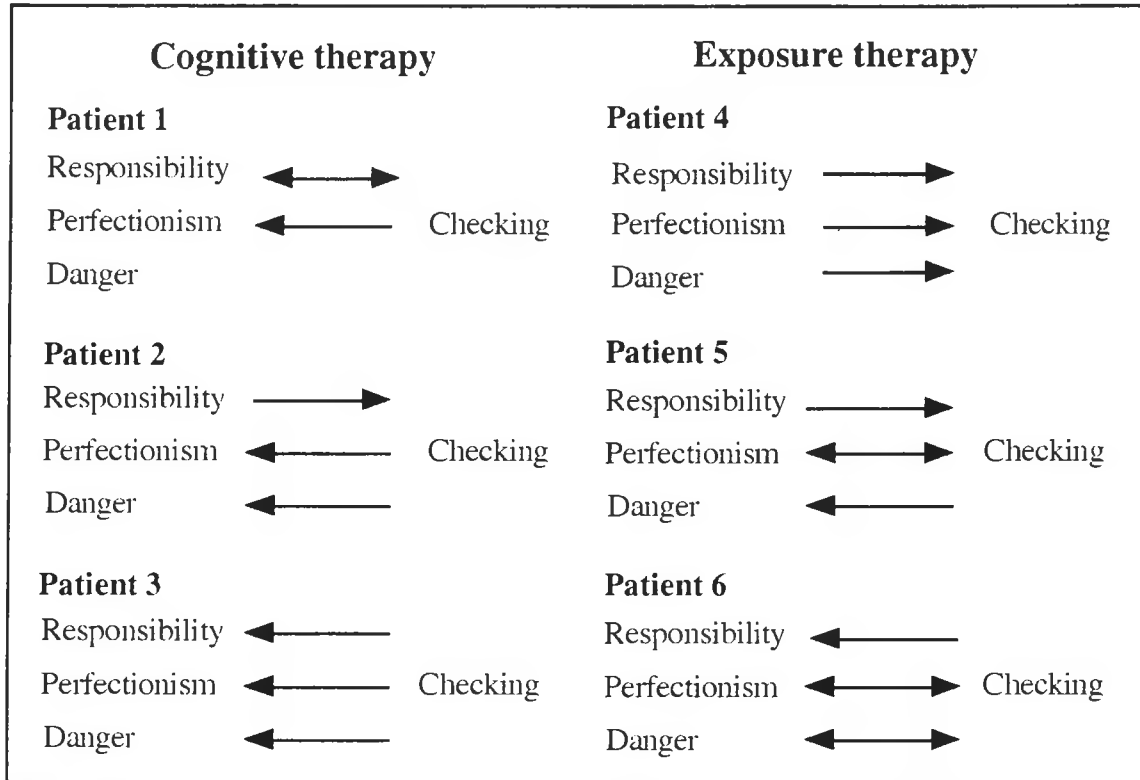


Figure 2

Summary of precedence testing

---> = indicates the direction of the significant precedence between each cognition and checking

Table 1

Summary of the ARMA models, with diagnostic indices of model adequacy

Patient	Order of the model		SBC	Residuals exceeding the critical X^2 value
	AR parameters	MA parameters		
1	1,2,3,7,8		1988.80	0
2	1,2,8		2734.46	0
3	1,2		2092.21	0
4	1,2		2588.38	0
5	1,3,7		1796.81	0
6	1,2,3,8		1941.33	0

Note: The first 3 participants were treated with cognitive restructuring; the others received exposure and response prevention. AR= Autoregressive parameters; MA= Moving average parameters; SBC= Schwarz's Bayesian Criterion.

Table 2
Precedence tests between the strength in beliefs and interference caused by checking

Patient	Representation of the null hypothesis	Precedence analysis			
		Parameter to be constrained ^a	X ²	df	p
1	Responsability \rightarrow Checking	$\phi^1_{13} = \phi^2_{13} = \phi^3_{13} = \phi^7_{13} = \phi^8_{13} = 0$	11.13	5	<.05
	Perfectionism \rightarrow Checking	$\phi^2_{14} = \phi^7_{14} = \phi^8_{14} = 0$	6.45	3	<.1
	Danger \rightarrow Checking	$\phi^3_{12} = \phi^7_{12} = \phi^8_{12} = 0$	3.79	3	<.3
	Checking \rightarrow Responsibility	$\phi^1_{41} = \phi^2_{41} = \phi^7_{41} = \phi^8_{41} = 0$	8.00	3	<.05
	Checking \rightarrow Perfectionism	$\phi^1_{31} = \phi^7_{31} = \phi^8_{31} = 0$	15.38	4	<.01
	Checking \rightarrow Danger	$\phi^1_{21} = \phi^3_{21} = \phi^7_{21} = 0$	3.45	3	<.4
	2	Responsability \rightarrow Checking	$\phi^1_{13} = \phi^2_{13} = \phi^8_{13} = 0$	15.49	3
Perfectionism \rightarrow Checking		$\phi^1_{14} = \phi^2_{14} = \phi^8_{14} = 0$	4.34	3	<.4
Danger \rightarrow Checking		$\phi^2_{12} = \phi^8_{12} = 0$	2.07	2	<.5
Checking \rightarrow Responsibility		$\phi^1_{31} = \phi^2_{31} = \phi^8_{31} = 0$	4.9	3	<.3
Checking \rightarrow Perfectionism		$\phi^8_{41} = 0$	20.72	1	<.00001
Checking \rightarrow Danger		$\phi^1_{21} = \phi^2_{21} = \phi^8_{21} = 0$	31.45	3	<.00001
3	Responsability \rightarrow Checking ^b	$\phi^1_{13} = \phi^2_{13} = 0$	1.76	2	<.2
	Perfectionism \rightarrow Checking ^b	$\phi^1_{14} = \phi^2_{14} = 0$	*	*	*
	Danger \rightarrow Checking ^b	$\phi^2_{12} = 0$	*	*	*
	Checking ^b \rightarrow Responsibility	$\phi^1_{31} = \phi^2_{31} = 0$	11.35	1	<.001
	Checking ^b \rightarrow Perfectionism	$\phi^1_{41} = \phi^2_{41} = 0$	8.03	1	<.01
	Checking ^b \rightarrow Danger	$\phi^1_{21} = 0$	10.60	1	<.01
4	Responsability \rightarrow Checking	$\phi^1_{13} = \phi^2_{13} = 0$	13.40	2	<.002
	Perfectionism \rightarrow Checking	$\phi^2_{14} = 0$	8.45	1	<.01
	Danger \rightarrow Checking	$\phi^1_{12} = \phi^2_{12} = 0$	14.28	2	<.001
	Checking \rightarrow Responsibility	$\phi^2_{31} = 0$	1.03	1	<.5
	Checking \rightarrow Perfectionism	$\phi^1_{41} = \phi^2_{41} = 0$	4.32	2	<.3
	Checking \rightarrow Danger	$\phi^2_{21} = 0$	3.79	1	<.1

Table 2 (continued)

Patient	Representation of the null hypothesis	Parameter to be constrained ^a	X ²	df	p
5	Responsability \nrightarrow Checking	$\phi^3_{13} = \phi^7_{13} = 0$	11.70	2	<.003
	Perfectionism \nrightarrow Checking	$\phi^1_{14} = \phi^3_{14} = \phi^7_{14} = 0$	9.51	3	<.1
	Danger \nrightarrow Checking	$\phi^1_{12} = \phi^7_{12} = 0$	5.19	2	<.1
	Checking \nrightarrow Responsibility	$\phi^1_{31} = \phi^7_{31} = 0$	5.21	2	<.1
	Checking \nrightarrow Perfectionism	$\phi^3_{41} = \phi^7_{41} = 0$	6.21	2	<.05
	Checking \nrightarrow Danger	$\phi^1_{21} = \phi^3_{21} = \phi^7_{21} = 0$	9.11	3	<.05
6	Responsability \nrightarrow Checking	$\phi^3_{13} = 0$	1.83	1	<.3
	Perfectionism \nrightarrow Checking	$\phi^1_{14} = \phi^2_{14} = \phi^3_{14} = \phi^8_{14} = 0$	13.28	4	<.01
	Danger \nrightarrow Checking	$\phi^1_{12} = \phi^2_{12} = 0$	15.53	2	<.001
	Checking \nrightarrow Responsibility	$\phi^1_{31} = \phi^2_{31} = \phi^3_{31} = \phi^8_{31} = 0$	37.08	4	<.0001
	Checking \nrightarrow Perfectionism	$\phi^2_{41} = \phi^3_{41} = \phi^8_{41} = 0$	15.93	3	<.01
	Checking \nrightarrow Danger	$\phi^1_{21} = \phi^3_{21} = \phi^8_{21} = 0$	21.66	3	<.0001

Six null hypotheses are tested: Responsibility \nrightarrow Checking (i.e., Strength in belief about responsibility does not precede Checking Interference), Perfectionism \nrightarrow Checking (i.e. Perfectionistic tendencies does not precede Checking Interference), Danger \nrightarrow Checking (perceived danger if ritual not performed does not precede Checking Interference). The three others concern reciprocal determinism: Checking \nrightarrow Responsibility, Checking \nrightarrow Perfectionism and Checking \nrightarrow Danger.

^a "Parameter to be constrained" express which parameter in the autoregressive matrix (ϕ) have to be constrained to test precedence. Superscripts refers to the order of the parameter. Subscripts refers to the position of the parameter in the matrix (line and column, respectively).

^b For this participant, Time spent for most important ritual was used as a measure of checking symptoms since non significant effect was obtained for none of the six precedence tests when using Checking Interference.

* The null hypothesis does not have to be tested. The condition was satisfied exactly by the model when constraints were applied during model estimation.

CHAPITRE 4

LES CHANGEMENTS DANS L'ÉTAT ÉMOTIONNEL, LES SYMPTÔMES ET
LES CROYANCES DURANT LE TRAITEMENT COGNITIF-
COMPORTEMENTAL DU TROUBLE OBSESSIONNEL-COMPULSIF

Résumé

La présente étude explore les liens temporels entre les états émotionnels négatifs, les obsessions et les croyances. Cinq patients rencontrant les critères diagnostiques pour le TOC participent à l'étude. Ils auto-évaluent quotidiennement (1) la présence des obsessions, (2) une croyance spécifique reliée au TOC, et (3) le niveau de leurs états émotionnels négatifs. Seize sessions d'une heure de thérapie cognitive-comportementale pour le TOC sont administrées, une fois par semaine. Des changements cliniquement significatifs sont obtenus pour trois des cinq patients. Les données d'auto-enregistrement sont soumises à l'Analyse de Séries Chronologiques Multivariée. Les résultats démontrent un lien significatif entre les états émotionnels et les obsessions pour 4 des 5 patients. De plus, un lien significatif entre les états émotionnels et les croyances est observé pour 3 des 5 patients. Ces résultats supportent les modèles théoriques qui postulent que les états émotionnels négatifs indépendants affectent ou seraient affectés par des variations de symptômes et de croyances. De façon intéressante, c'est seulement chez les patients ayant obtenu des résultats cliniquement significatifs que les changements sur le plan des obsessions et des croyances ont précédé les changements dans les états émotionnels. Ces résultats suggèrent qu'une diminution des obsessions et des croyances durant le traitement cognitif-comportemental efficace aurait un impact sur les états émotionnels indépendants. Finalement, des mécanismes distincts pourraient être impliqués chez les patients qui répondent au traitement et ceux qui n'y répondent pas.

Mood states, symptoms and beliefs changes during the cognitive-behavioral treatment of Obsessive Compulsive Disorder.

Josée Rhéaume and Robert Ladouceur
Université Laval, Québec.

Ecole de Psychologie, Université Laval, Québec

Abstract

The present study explores the temporal link between negative mood states, obsessions and beliefs. Five patients meeting diagnostic criteria for OCD participated in the study. They rated daily (1) the presence of obsessions, (2) a specific belief related to OCD, and (3) the level of their negative mood states. Sixteen one hour sessions of cognitive-behavioral treatment for OCD was conducted weekly. Clinically significant change were obtained for three patients out of five. Self-rating data was submitted to Multivariate Time Series analysis. Results show a significant link between mood states and obsessions for all but one patient. Moreover, a significant link was found between mood states and beliefs in 3/5 patients. These results support both theoretical views that state that independent negative mood states may affect or be affected by variations in symptoms and beliefs. Interestingly, only for patients with clinically significant results, both changes in Obsessions and Beliefs preceded change in Mood states. These results suggest that the decrease in obsessions and beliefs during successful cognitive-behavioral treatment has an impact on independent mood states. Finally, distinct mechanisms may be involved among treatment responders and nonresponders.

Mood states, symptoms and beliefs changes during the cognitive-behavioral treatment of Obsessive Compulsive Disorder

Obsessive-compulsive Disorder (OCD) is often accompanied by anxious and depressive mood (Fogelson, Bystritsky, & Sussman, 1988; Rachman & Hodgson, 1980; Insel, 1983; Emmelkamp, 1990). Indeed, it is well recognized that a fair percentage of OC patients also have a comorbid anxiety or mood disorder (Weissman, Bland, Canino, Greenwald, Hwu, Lee, Newman, Oakley-Browne, Rubio-Stipec, Wickramarathe, Wittchen, & Yeh, 1994). Although there is some disagreement across studies about the real comorbidity between these disorders and OCD (e.g., Yaryura-Tobias & Neziroglu, 1983; Rasmussen & Tsuang, 1986), most authors agree that negative mood states are often present with OCD and contribute to emotional distress. Mood disturbance has also been associated to treatment failure and relapse with this population (e.g., Beech & Vaughan, 1978; Marks Stern, Mawson, Cobb, & McDonald, 1980; Cottraux, Messy, Marks, Mollard, & Bouvard, 1993).

The concept of mood generally includes anxious, depressive and irritable states. Guilt is another emotion that has been associated with this disorder (Steketee, 1993). It has been suggested that the variations in mood states associated with OCD result from minor life events or hassles (Freeston & Ladouceur, in press). In an epidemiological study of 200 patients, almost all patients reported that stressful life events worsened their OC symptoms (Rasmussen & Eisen, 1991). Examples of life events reported by OC patients are being ill, insufficient rest, stupid mistakes, social obligations, unexpected visits, conflicts and, for women, discomfort associated with menstruation. It has been proposed that daily life events would act as indirect triggers linked to worsening symptoms (Freeston & Ladouceur, in press).

On a theoretical level, some authors have suggested that variations in mood states have a direct effect on the vicious circle of obsessions and compulsions. Rachman & Hodgson (1980) have proposed that under conditions of agitation or stress, individuals may experience increased ruminations that are difficult to ignore or prevent. Disturbed mood, especially depression, may also retard habituation process (Rachman & Hodgson, 1979). Moreover, Warren & Zgourides (1991) stipulate that stress and negative affect would be associated with irrational appraisals with this population. In his model, Salkovskis (1985) proposed that mood disturbance would widen the range of stimuli that provoke intrusion in the first place, the range of intrusions that lead to negative automatic thoughts, and the activity level of pre-existing dysfunctional schemata. Although not central to his model, mood disturbance acts at different levels in reinforcing the vicious loop of obsessions and compulsions.

Coherent with this theoretical view, we have given a modulating role to negative mood states in the maintenance of OC symptoms in our model (Ladouceur, Freeston, & Rhéaume, 1996; Freeston & Ladouceur, 1996). First, negative mood state increases the frequency and duration of obsessions (Rachman, 1981). Second, it increases the likelihood of inadequate appraisal concerning both the nature and probability of anticipated negative consequences (Freeston & Ladouceur, 1996). Third, it has been shown to decrease the efficacy of neutralization (Freeston, Ladouceur, Provencher & Blais, 1995). Finally, negative mood state accentuates hypervigilance for stimuli that trigger obsessions (Mathews, 1990) and decreases motivation and ability to practice the strategies learnt during treatment.

On a clinical level, there is also a general recognition of the presence of mood disturbance in association with OC symptoms. In their

recommendations for the use of Cognitive Therapy for OCD, van Oppen & Arntz (1994) pointed out that depressive mood often had to be targeted during therapy. More specifically, Salkovskis & Warwick (1985) reported that there appeared to be a clear link between external stress and the frequency of neutralization strategies used by their patient in a case study.

There is already some empirical evidence that negative mood state can influence cognitions. Clinically anxious patients would pay more attention to threatening information than nonclinical participants (Mathews & MacLeod, 1985, 1986). On the other hand, depressed participants show superior recall of negative words compared to neutral or positive words (Mathews & MacLeod, 1987). These results, taken together, suggest that anxiety states involve attentional processes while depressive states involve deeper encoding related to mnemonic processing (Freeston, Ladouceur, Letarte, Rhéaume, Thibodeau, & Gagnon, 1994). More importantly, what these studies tell us is that negative mood states have an impact on the way people process the informations they receive.

Other studies have also emphasized the impact that mood state have in influencing the way individuals evaluate their intrusive thoughts. For example, anxious participants evaluate ambiguous information as more threatening (Eysenck, MacLeod, & Mathews, 1987; Mathews, Richards, & Eysenck, 1989). Clinically anxious and depressed participants believe that negative life events were more likely to happen to them than controls (Butler & Mathews, 1983). Miranda and colleagues demonstrated that dysfunctional beliefs vary with spontaneous diurnal mood fluctuations in depressed psychiatric patients and in patients recovered from a previous depressive episode (Miranda, Persons, & Byers, 1990). In a recent study with a nonclinical sample, Freeston and colleagues found a significant correlation between mood

intensity and the subjective evaluation of the probability and intensity of intrusive thoughts occurring (Freeston et al., 1995). Finally, others have found a significant link between level of emotion (e.g., anger) and judgment of responsibility for hypothetical accidental damage in nonclinical participants (Van Der Keilen & Garg, 1993).

Despite both the theoretical and clinical recognition of the role of mood in mediating OCD, few studies have focused on the link between mood and OC symptoms. Using a within subjects design, Freeston and Ladouceur (1995) evaluated a group of 27 patients suffering from obsessions when their mood was naturally negatively elevated and when calm. They found that mood was significantly related with obsessions, appraisal, and specific beliefs in their sample. They also showed a covariation between mood and daily life events. Although interesting, since this study cannot establish a pattern of temporal link between mood and OC symptoms neither cognitions, they still do not answer to the question of whether mood is a consequence of OCD or a predispositional factor.

One way of studying the process of mood and symptoms change involves the use of single case methodology. One example of this strategy was demonstrated by Freeston & Bouchard (1995) who have explored the temporal links between mood, life events, obsessions and cognitions of a patient suffering from aggressive obsessions during treatment. They submitted the daily self-rated variables to Multivariate Time Series analysis and found that for this patient, change in the number of daily life events significantly preceded both changes in obsessions and cognitions. Moreover, mood was significantly associated with daily life events although it preceded them rather than followed them.

The covariations between cognitions and OC symptoms has already been studied within OC samples. In a study using the information processing paradigm, Foa & McNally (1986) demonstrated that OC patients showed better detection of fear-relevant words than neutral words on a dichotic listening task before treatment, but not after treatment. This suggests that the treatment would have an impact on cognitive bias. In a clinical study by van Oppen and colleagues, only OCD participants in Cognitive Therapy showed a significant decrease on the Irrational Belief Inventory after treatment (van Oppen, de Haan, van Balkom, Spinhoven, Hoogduin, & van Dickenson, 1995). Recently, Freeston and colleagues showed that contrarily to general beliefs, post-treatment scores on the Irrational Beliefs Related to Obsessions inventory were significantly correlated with clinical improvement of pure obsessionals (Freeston, Ladouceur, Gagnon, Thibodeau, Rhéaume, Letarte, & Bujold, 1997). Finally, we found that cognitive change significantly preceded change in compulsions at some point during treatment for most patients in Cognitive therapy or Exposure treatment (Rhéaume & Ladouceur, 1997).

The present study examines the mechanisms of individual mood change during Cognitive-behavioral Therapy of OCD using Multivariate Time Series (MTS) analysis. The main purpose was to explore the temporal link between negative mood state, obsessions and cognitions. A second goal was to extend upon a previous study on the precedence of cognitive change over symptom change (Rhéaume & Ladouceur, 1997). We hypothesized that variations in mood states would be associated with variations in obsessions. A second hypothesis stipulated that variations in mood states should also be associated with variations in cognitions. Both directions should be present since mood has been stipulated to be both a consequence and a predispositional factor of OC symptoms. A secondary hypothesis was formulated; we predicted

that variations in cognitions should be associated with variations in obsessions. Here again, we expected bi-directional links between cognitions and symptoms, as we found in a previous study (Rhéaume & Ladouceur, 1997).

Method

Participants

Recruitment. Patients were recruited from a larger sample of OC patients (see chapter three, part one for details). Participants who did not meet specific criteria for another study but still met clinical criteria for OCD were interviewed for this study. In each case, the diagnosis was established using the Anxiety Disorder Interview Schedule for the DSM-IV (APA, 1994). Each diagnosis was confirmed by having an independent psychologist listen to the audiotaped interviews.

Exclusion criteria. The following exclusion criteria were used: (a) principal diagnosis other than OCD; (b) self-report of less than one hour of obsessions or compulsions, or minimal interference; (c) duration of illness of less than six months; (d) current diagnosis of alcohol dependency or abuse; (e) any signs of bipolar disorder, psychotic features, or severe personality disorders; (f) age below 18 or above 65; (g) refusal to interrupt a parallel psychological treatment; (h) if taking medication, use for less than one month and (i) refusal to maintain medication during treatment.

Patient 1 was a 39 year old single woman, working part time as a maid. She was suffering from compulsive checking of doors, lights, and electric appliances at home for the last 12 years. In these situations, she was afraid of being responsible for a catastrophe. She also compulsively washed her hands, clothes and house in general. Her main complaint concerned the checking

that took her several hours a day. She had been taking clonazepam .25 mg for several years.

Patient 2 was a 21 year old college student, living with her brother. She was suffering from religious obsessions that began one year and a half prior to consultation. They took the form of horrific flashes of scenes from horror movies and were interpreted as committing a sin. She was using different forms of neutralization, such as praying, saying "stop", or searching for reassurance. Obsessions were present at least four hours a day and were interfering with her sleep.

Patient 3. For approximately one year, this 24 year old college student was obsessed with the idea of losing control and stabbing her boyfriend to death. Her first episode appeared 4 years prior to consultation and had lasted for two years. She was avoiding knives, dangerous objects, and staying alone with him. Overt compulsions were absent. Her obsessions were causing her great distress and took about an hour a day.

Patient 4 is 36 year old married woman, with two children, working as a nurse. For two years, she had been suffering from checking behaviors mainly at work. On her way home, she often had doubts about having made a professional mistake, and had to mentally rerun the film of her actions. She also asked for reassurance from her husband and coworkers. At the time of consultation, she was returning from a sick leave and working part time. She had started taking Nozinan 2 mg four months before beginning treatment.

Patient 5. This 37 year old married woman complained of 2 years of sexual obsessions concerning children. She was also preoccupied with the idea of being responsible for contaminating people, especially pregnant women. She was reassuring herself by rerunning series of past events in her head.

Because she wanted to become pregnant herself, she stopped taking Fluvoxamine 50 mg six weeks before treatment.

Experimental protocol

A single case between subjects design was used (see Kazdin, 1993). In this protocol, the intervention is introduced at a different moment for each patient. It is possible to establish a causal relationship when change for each patient follows closely the introduction of the intervention.

Baseline

Three sessions of approximately ninety minutes were conducted during baseline for assessment and explanation of self-rating procedures. Before the establishment of baseline, the clinician identified obsessions and compulsions with the patient and explained the self-rating methods. An independent evaluator administrated the Y-BOCS (Goodman, Price, Rasmussen, Mazure, Fleischmann, Hill, Heniger, Charney, 1989a) semi-structured interview to assess severity and depth of OC symptoms.

Treatment

Sixteen one hour sessions of cognitive-behavioral treatment for OCD was conducted weekly. For two patients (participants 4 and 5), four supplementary sessions of treatment were administered since symptoms were still present. Treatment consisted of cognitive correction of dysfunctional attitudes and beliefs using the cognitive therapy developed by Beck and his colleagues (Beck, 1976; Beck, Rush, Shaw, & Emery, 1979) and specific clinical guidelines for this population (Freeston, Rhéaume & Ladouceur, 1996).

Exposure and Response Prevention were presented in a cognitive-behavioral formulation, as behavioral experiments to challenge irrational beliefs.

Treatment integrity

Treatment integrity was ensured by having an independent evaluator listen to 15% of the treatment sessions for each participant. As recommended by Kazdin (1993), both the necessary and not allowed interventions were listed on distinct grids for each condition. The agreement score was 93%, suggesting that treatment was conducted according to the initial clinical guidelines.

Dependent variables

Self-ratings. (1) Participants rated the presence of obsessions. (2) They also rated daily the extent to which they believed in a personal statement concerning one of the distinct faulty appraisals recognized as being relevant to OCD: Overimportance of thought, overestimation of the consequences, responsibility, and perfectionism (Freston, Rhéaume, & Ladouceur, 1996). The belief was selected according to responses to different questionnaires and then reformulated in a personalized way. (3) Finally, participants rated daily their level of negative mood. They first had to select which of three descriptors (anxious, depressed, irritable) best described their mood during that day. They then rated the level of their mood. To ensure that mood was evaluated independently of OC symptoms, we asked patients to note situational life events that had contributed to this mood state.

These variables were rated by patients at the end of each day, throughout all of the treatment, and a week before six month follow up. Our research team has already used these scales with OC patients (see Ladouceur, Freston, Gagnon, Thibodeau, & Dumont, 1993; Ladouceur & Rhéaume, 1997).

They consisted of small booklets, in which the first page contained the general 0 to 100 category partitioning scale (Ellermeier, Westphal & Heidenfelder, 1991) followed by four pages; one for each question (one booklet for each week).

Symptom measures

The Yale-Brown Obsessive-Compulsive Semi-structured interview (Y-BOCS; Goodman et al., 1989a), assesses the severity of obsessions and compulsions with 10 questions. First, patients are presented with a list of OC symptoms and rate to what extent they have experienced each of them in the past or currently. Then the participants answer the different questions according to all obsessions or compulsions for the last seven days. The interview shows good internal consistency, sensitivity to clinical change and good concurrent validity (Goodman et al., 1989a, 1989b). Although Woody and colleagues obtained a poor Test-retest reliability after 48 days (Woody, Steketee, & Chambless, 1995), the Y-BOCS is the best available measure of OC symptoms in terms of reliability, validity and sensitivity to treatment effects (Taylor, 1995).

The Padua Inventory (PI; Sanavio, 1988) is a 60-item measure of obsessive and compulsive symptoms. Four factors of this measure have been identified and replicated in Italy, Holland, the United States and Quebec: Mental Control, Contamination, Verification, and Impulse Control. The psychometric properties of the French version are excellent (Freeston, Ladouceur, Letarte, Rhéaume, Gagnon, & Thibodeau, 1995).

Patients completed the two measures before treatment, at post-test and at six month follow up.

Process measures

The Perfectionism Questionnaire (PQ; Rhéaume, Freeston, & Ladouceur, 1995) was developed in response to criticism made on previous measures of perfectionism which includes correlates of perfectionism. The PQ contains 64 items, divided into three subscales: (1) perfectionistic tendencies (10 items, $\alpha=.82$), (2) domains affected by perfectionistic behavior (30 items, $\alpha=.88$), and (3) negative consequences of perfectionism (24 items, $\alpha=.96$). The instrument shows good construct validity.

The R-Scale (RS; Salkovskis, 1992) is a belief scale about responsibility in OCD. It contains 27 statements typical of obsessional patients (e.g., Doing nothing to prevent a negative outcome is as bad as causing the problem). A French adaptation of the initial version has recently been developed for the purpose of a series of studies on OCD. The instrument shows a good reliability ($\alpha=.94$) and concurrent validity (Rhéaume, Ladouceur, & Freeston, 1996).

The Typical Interpretation of Thoughts questionnaire (TIT; Freeston, Rhéaume, Letarte, Dugas, & Ladouceur, 1993) is a 30 item questionnaire measuring different ways by which the individuals evaluate the presence or content of the intrusive thoughts. We found a three factor solution in a clinical anxious group (52% OCD) where the first factor was named "Importance given to thoughts" (13 items), the second factor, "Thought Action Fusion" (9 items), and the third factor "Implications of the thoughts on the individual" (8 items). Examples of the items are : Having an aggressive thought means that I secretly want it to happen; If I have these horrible thoughts, they might ruin my day. The TIT shows good convergent and discriminant validity, and specificity (Freeston, Rhéaume, Dugas, & Ladouceur, 1995).

In the present study, the process measures were used to select a specific belief for self-rating data.

Results

Individual pre-treatment differences

Table 1 presents the ADIS-IV severity scores, comorbidity, Y-BOCS scores, duration of illness and medication for the five patients. The ADIS-III-R pre-treatment scores suggest that patients were similar according to symptoms severity. The Y-BOCS scores ranged from 20 to 28. All but one participant (Patient 2) were free of comorbid axis I disorders and their symptoms had begun less than four years ago (except for Patient 1). Two patients took medication (patients 1 and 4). Overall these patients were representative of patients consulting our clinic in terms of severity and clinical features (Rhéaume, Freeston, Léger & Ladouceur, in press).

Insert Table 1 here

Clinical significance

Table 2 shows the individual scores on the OC symptoms measures before treatment, after treatment and at six month follow up, as well as clinical significance. Two indicators of clinical significant changes were calculated: end state functioning and the magnitude of change after treatment using the Reliable Change index (RC; Jacobson and Truax, 1991). The cutoff point for clinically significant change for the Y-BOCS was 13.75 and 60.61 for the PI.

Results show that for three out of five patients (patients 1, 2 and 3), Y-BOCS scores were in the nonclinical range after treatment. These results remained stable at six month follow up except for patient 4, who's score

attained nonclinical significance. Results on the PI show that 3 patients were in the nonclinical range after treatment (patients 1, 3 and 5). Moreover, although the post-test score stayed in the clinical range for patient 2, RC was significant indicating the magnitude of change was real. At follow up, all PI scores reached clinical significance (except for patient 5). Overall, 3 patients were clinically improved on the two measures at post-test.

Insert Table 2 here

For general functioning measures (see Table 3), results showed a similar pattern; 3 patients out of 5 scoring in the nonclinical range on the BDI after treatment and six months after treatment. For the BAI, results were less clear, only participant 1 showing clinical significance at post-test and 2 patients reaching this criteria at follow up.

Insert Table 3 here

Self-rating data

Self-rating data was analyzed using the vector autoregressive and moving-average (V-ARMA) modeling technique. For all but one participant, the series of daily self-monitored observations from the first day of treatment to the end of the intervention were submitted to the analysis. For patient 1, observations from the last 30 days of treatment were eliminated from the analysis because at least 3 series were flat after the 12th week. In order to give enough span to conduct the analysis, data from baseline were also included, for a total of 95 observations. Three series were included in the model building of each participant: one for the OC symptoms (presence of obsessions), one for

cognitions, and one for mood (see Figure 1). Table 4 depicts the summary of the ARMA models for each patient, with diagnostic indicators of model adequacy. We used the Schwarz's Bayesian Criterion (SBC; Lütkepohl, 1985) and the residuals exceeding the critical chi-square value.

Insert Figure 1 and Table 4 here

Precedence testing

Multivariate Time Series analysis was conducted to evaluate the temporal links between mood states, obsessions and beliefs. A complete description of the results is presented in Table 5 and a summary is depicted in Figure 2. Results show different patterns of temporal links between the 3 variables. The precedence tests reveal that Mood states change preceded Obsessions change for 3 patients and Beliefs change for 2 patients. Beliefs preceded Obsessions for 2 patients. In order to allow potential reciprocal interaction, the reverse links were also tested. Results show that change in Obsessions and beliefs preceded change in Mood state for 3 patients. Finally, Obsessions preceded belief change for 3 patients.

Insert Table 5 and Figure 2 here

Discussion

The aim of the present study was to examine the individual relationships between variations in negative mood states, symptoms and beliefs during cognitive-behavioral treatment of OCD. Results show a

significant temporal link between mood states and obsessions for all but one patient. Moreover, a significant link was found between mood states and beliefs in 3/5 patients. Interestingly, only for patients with clinically significant results, both changes in Obsessions and Beliefs preceded change in Mood states. These results suggest that the decrease in obsessions and beliefs during successful cognitive-behavioral treatment have an impact on independent mood states. Finally, distinct mechanisms may be involved among treatment responders and nonresponders.

Results on the Y-BOCS show that the intervention was clinically significant for 3 out of 5 patients at post-test. These gains were maintained at six month follow up. Although the score from patient 4 reached nonclinical significance at follow up, some temporary external factors at work may have accounted for this reduction of OC symptoms. Results on the PI show that 3 patients were in the nonclinical range after treatment. Moreover, although the post-test score stayed in the clinical range for patient 2, RC was significant, indicating that the magnitude of change was real. At follow up, all PI scores were in the clinical range. Note that for all but patient 2, pretreatment scores on the PI were quite lower than usually seen in OCD samples. This may reflect the high proportion of ruminators in our sample, who have been showed to score significantly lower than patients with overt compulsions on this instrument (Freeston, Ladouceur, Rhéaume, Dugas, & Langlois, 1997-etude 1). Overall, 3 patients were clinically improved on the two measures at post-test.

Note that patient 4 and 5 did not significantly improve after treatment. In the first case, the urge to compulsive seemed very strong at some point, and the patient refused to expose herself when the anxiety was too high. Indeed, the inability to suspend rituals and difficulty tolerating anxiety during exposure sessions is often responsible for therapeutic failures (Foa, Steketee, &

Groves, 1979). The lack of significant improvement for patient 5 may be attributable to both the presence of overvalued ideations and schizotypal personality traits, which have been associated with poorer prognosis with this population (Foa, 1979; Foa, Steketee, Grayson, & Doppelt, 1983; Rachman, 1983).

The examination of the series for the five patients is interesting. Both self-ratings of obsessions and cognitions seem to be tightly related to treatment response, since the series tend to decrease for the three patients who obtained clinically significant results on the YBOCS at post-test, whereas they did not show this pattern for the two patients who benefited less from therapy. On the other hand, for mood states, the series seemed less related to treatment outcome. These observations are coherent with the fact that treatment focused directly on both symptoms and cognitions, and did not target mood states provoked by independent daily life events.

A Multivariate Time Series analysis was carried out for each patient to test if change in mood states preceded change in obsessions. Results showed that for 3 patients, change in Mood states preceded change in Obsessions. Moreover, only for all 3 patients who obtained clinically significant results at post-test, change in Obsessions preceded change in Mood states during treatment. This result suggests that the decrease in obsessions during successful cognitive-behavioral treatment has an impact on independent negative mood states. Most cognitive-behavioral models assume that OCD leads to a deterioration of mood states. Others (e.g., Ladouceur, Freeston, & Rhéaume, 1996; Salkovskis, 1985) have suggested that negative mood states may play a mediating role in exacerbating the vicious circle of OCD. Considering the presence of bidirectional links in the present study, these results give partial support for both roles that may be encountered by negative mood states. Further studies will be necessary to clarify this question.

A second goal of this study was to test the temporal link between Mood states and Beliefs. A significant temporal link was found for 3 patients. Results show that change in Mood states preceded belief change for only 2 patients, which provides poor support for the generally well admitted idea that mood states influence the endorsement of beliefs (Persons & Miranda, 1991; Freeston et al., 1995). The reverse effect was found for 3 patients. Other cognitive variables that were not measured in the present study may play a significant role as well. In a recent article, it has been proposed that OC patients evaluate their intrusive thoughts as a function of various faulty appraisals (Freeston, Rhéaume, & Ladouceur, 1996). Mood state may have different relationships with specific beliefs. Freeston and colleagues (1995) have found that mood states influence the subjective evaluation of both the probability and severity of feared consequences. The present study emphasizes how mood may be related to other forms of appraisals, such as overimportance given to thoughts and perfectionistic ideas.

Another aim of the present study was to test whether previous findings where temporal links between cognitions and checking behaviors could be generalized to other OC symptoms (Rhéaume & Ladouceur, 1997). A significant link between beliefs and obsessions was found for all patients. Although belief change preceded Obsessions for 3 patients (2, 4, and 5), Obsessions preceded beliefs change also for 3 patients (1, 2, and 3). In recent cognitive models of OCD, specific cognitive change have been postulated to be responsible for the maintenance of symptoms (Salkovskis, 1985; Freeston & Ladouceur, 1996). On the other hand, Rachman gives a rationale for the other direction with his vision of safety acquisition through exposure, whereby patients accumulate disconfirmatory evidence that have an impact on beliefs.

Bandura (1986) has emphasized the existence of a bidirectional relationship between cognitions and symptoms.

For all treatment responders, change in obsessions preceded change in mood states and belief change. Moreover, only for these patients, change in beliefs preceded mood change. Taken together, these results suggest that distinct mechanisms may be involved when treatment is successful or not. Systematically comparing both treatment responders and nonresponders on these process variables represent a promising approach for learning how the postulated variables may influence each other and how they may predict outcome.

Interestingly, the two patients who responded less to treatment are those for whom we found fewer significant links between the 3 variables. Thus, the only significant relationship were for Beliefs preceding obsessions and mood preceding obsessions. In a recent study (Rhéaume & Ladouceur, 1997), we observed more significant links for patients in Exposure Therapy (ET) than Cognitive Therapy (CT). However, all 3 patients in ET were symptom free after treatment, compared to 2 patients in CT who still reported minimal symptom interference on self-rating data. Thus, it may be that the number of significant links between variables would be related to treatment response; the more clinical improvement, the more number of significant links between the variables. Exploring these links before treatment may control for this effect.

Examination of individual results show a wide range of patterns according to both the number of relationships that were significant and the direction of the temporal links. This suggests that the mechanism by which individuals may change their obsessions, distorted beliefs and mood states may be highly idiosyncratic. Although theoretical models have the advantage of providing a monothetic explanation for human problems, they may

underestimate individual differences. Most studies that have addressed the question of processes in OCD, have mainly relied on group comparison designs, which limit our understanding of the mechanisms of change (Rachman, 1997; Salkovskis, 1996). Studying the process of change within single case design represents a necessary complementary approach to the understanding of such mechanisms.

Combined with the variations in cognitions, variations in mood state may have considerable clinical repercussions. Persons & Miranda (1991) have suggested that negative mood may facilitate access to dysfunctional cognitive schemas during cognitive restructuring. However, mood disturbance may interfere with the way patients understand and accept exposure (Freeston and Ladouceur, 1997). The combination of pharmacological and cognitive-behavioral treatment may represent an appropriate alternative for these cases (Ladouceur, Freeston, & Gagnon, 1994). Moreover, since negative mood states also predict relapse, one should include an explanation of how negative mood states may reinforce the vicious circle of OCD while doing relapse prevention, in order to give patients a sense of when they are most vulnerable (Freeston & Ladouceur, 1993).

Results from the present study also have methodological implications. Despite the limitations related to the use of self-rating data (Meichenbaum & Turk, 1987) and the complexities of the statistics, MTS analysis has shown to be a powerful statistical tool to study the mechanism of change over the course of therapy. This method possesses numerous advantages as it can allow the examination of individual change and comparisons with other participants.

Overall, the present study demonstrated significant temporal relationships between negative mood states, symptoms and beliefs during cognitive-behavioral treatment of OCD. These results support both theoretical

and clinical views that independent negative mood states may affect or be affected by variations in symptoms and beliefs. Interestingly, only for patients with clinically significant results, both changes in Obsessions and Beliefs preceded change in Mood states. These results suggest that the decrease in obsessions and beliefs during successful cognitive-behavioral treatment have an impact on independent mood states. Finally, distinct mechanisms may be involved among treatment responders and nonresponders. Systematically comparing these two groups may provide a better answer to that question. Finally, studying the relationships between these variables without the impact of treatment may also contribute to specifying the mechanisms that maintain OC symptoms.

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Authors Note

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Correspondence to Josée Rhéaume, Ecole de psychologie, Université Laval, Québec, CANADA, G1K 7P4.

Figure 1
Self-ratings of mood state, obsessions and beliefs for all patients

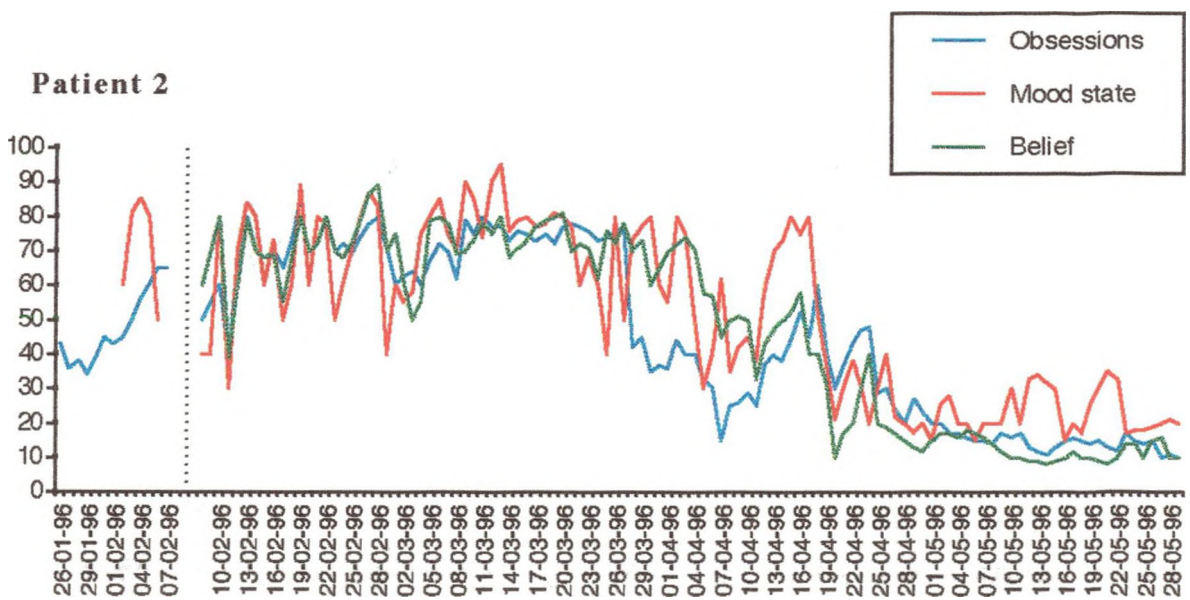
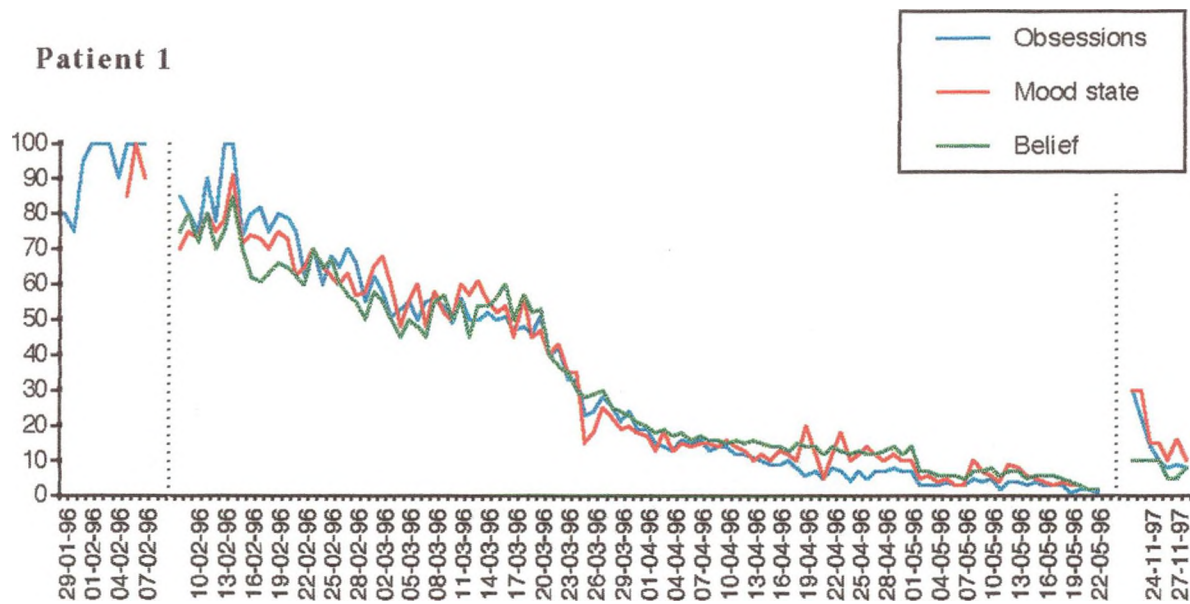
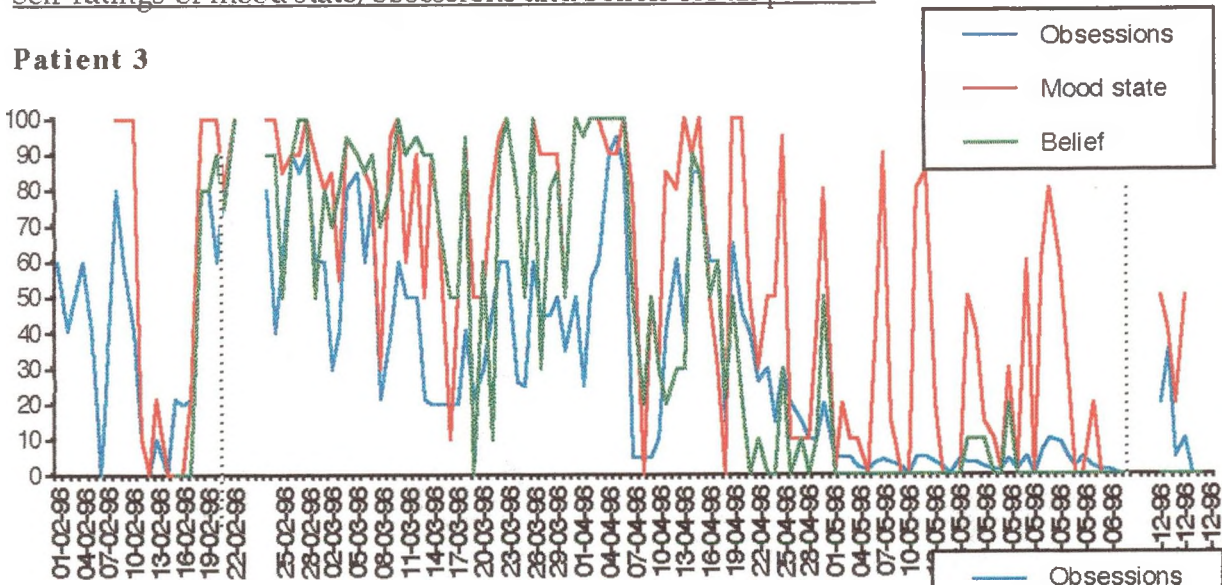


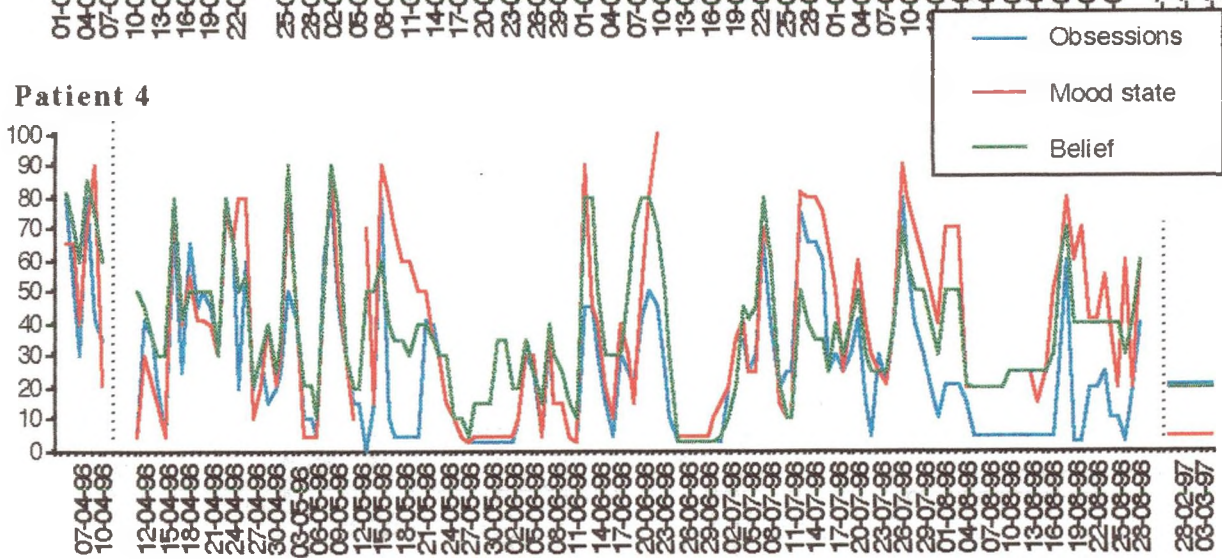
Figure 1 (continued)

Self-ratings of mood state, obsessions and beliefs for all patients

Patient 3



Patient 4



Patient 5

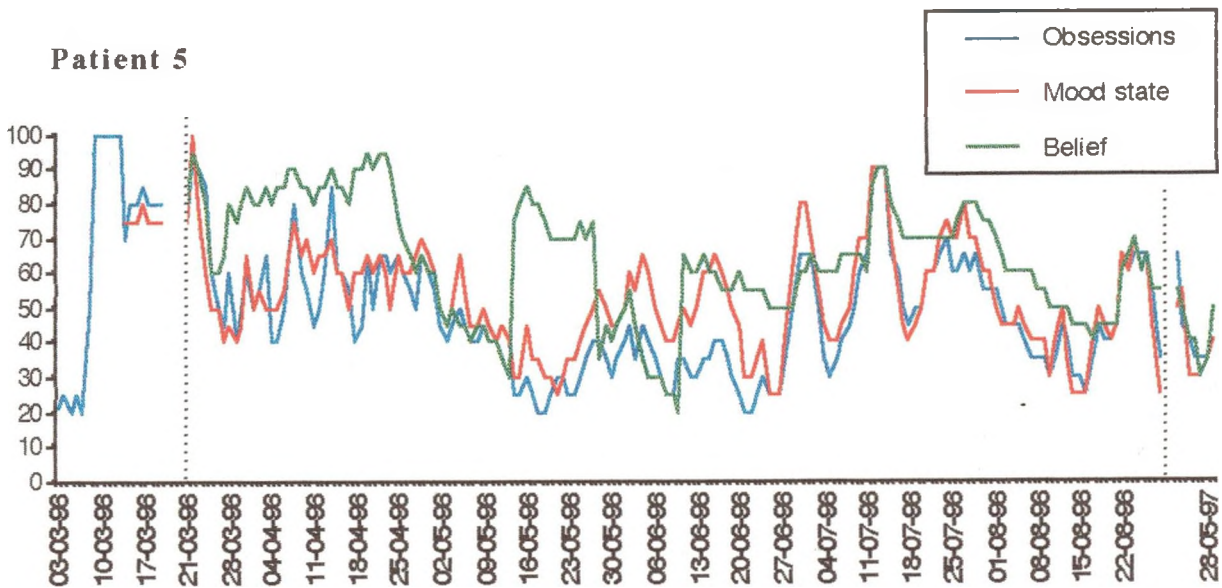
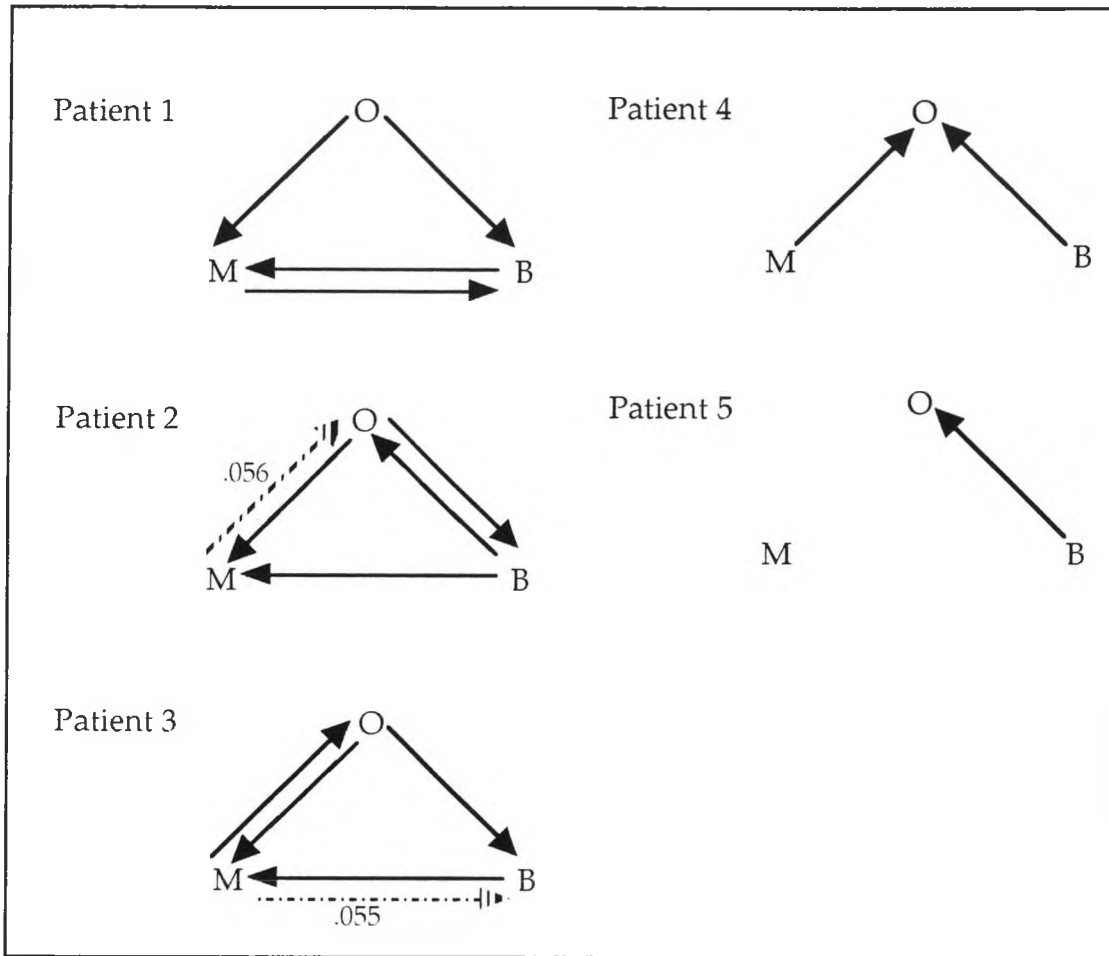


Figure 2
Summary of precedence testing



→ = significant precedence in this direction.

Table 1
ADIS-IV severity scores, comorbidity and duration of illness

Pretreatment scores					
Patient	ADIS-IV severity	Secondary diagnoses	YBOCS Score	Duration of illness	Medication
1	8		26	12 years	yes
2	7	Social phobia (sev:4) GAD (sev:3) Major Depression (6)	22	1 1/2 year	no
3	7	Major Depression (sev:2)	21	4 years*	no
4	7	none	28	2 years	yes
5	7	none	20	2 years	no

* two episodes over this period.

Table 2

Individual scores on the measures of OC symptoms before treatment, after treatment and at six month follow up and clinical significance

Patient	Pre-test	Post-test	Follow up	Clinical significance	
				Post-test	Follow up
YBOCS					
1	26	4	13	*	*
2	22	9	9	*	*
3	21	4	9	*	*
4	28	18	6	ns	*
5	20	17	15	ns	ns
PI					
1	73	53	44	*	*
2	139	76	a	ns	a
3	49	10	13	*	*
4	66	66	11	ns	*
5	62	45	32	*	*

YBOCS = Yale-Brown Obsessive-Compulsive Scale, PI = Padua Inventory.

* = .05.

a : Missing data.

Table 3

Individual scores on the general functioning measures before treatment, after treatment and at six month follow up and clinical significance

Patient	Pre-test	Post-test	Follow up	Clinical significance		
				Post-test	Follow up	
BDI						
1	4	0	0	*	*	
2	32	6	b	*	a	
3	21	1	2	*	*	
4	12	14	0	ns	*	
5	22	8	14	ns	ns	
BAI						
1	4	2	2	*	*	
2	33	14	b	ns	a	
3	10	14	8	ns	ns	
4	9	18	3	ns	*	
5	7	18	8	ns	ns	

BDI = Beck Depression Inventory, BAI = Beck Anxiety Inventory.

*=.05.

^b : Missing data.

Table 4

ARMA models with diagnostic indices of model adequacy

Patient	Order of the model		SBC	Residuals exceeding the critical X^2 value
	AR parameters	MA parameters		
1	1,2	6	1006.40	0
2	1,3,5,8		1672.13	0
3	1,2,7,8		2249.85	0
4	1,2,4		2701.12	0
5	1,2,5		2599.74	0

AR= Autoregressive parameters; MA= Moving average parameters; SBC= Schwarz's Bayesian Criterion.

Table 5
Precedence tests between Mood State, Obsessions and Beliefs

Patient	Representation of the null hypothesis	Precedence analysis			
		Parameter to be constrained ^a	X ²	df	p
1	Mood \nrightarrow Obsessions	$\varnothing^1_{12} = \varnothing^2_{12} = \varnothing^6_{12} = 0$	5.2	3	.16
	Mood \nrightarrow Beliefs	$\varnothing^3_{32} = \varnothing^2_{32} = \varnothing^6_{32} = 0$	11.71	3	<.01
	Beliefs \nrightarrow Obsessions	$\varnothing^1_{13} = \varnothing^2_{13} = \varnothing^6_{13} = 0$	4.73	3	.19
	Obsessions \nrightarrow Mood	$\varnothing^2_{21} = \varnothing^6_{21} = 0$	12.27	2	<.01
	Beliefs \nrightarrow Mood	$\varnothing^1_{23} = \varnothing^2_{23} = \varnothing^6_{23} = 0$	11.59	3	<.01
	Obsessions \nrightarrow Beliefs	$\varnothing^2_{31} = \varnothing^6_{31} = 0$	6.71	2	<.01
2	Mood \nrightarrow Obsessions	$\varnothing^1_{12} = \varnothing^3_{12} = \varnothing^5_{12} = \varnothing^8_{12} = 0$	9.25	4	<.06
	Mood \nrightarrow Beliefs	$\varnothing^3_{32} = \varnothing^5_{32} = \varnothing^8_{32} = 0$	4.91	3	.18
	Beliefs \nrightarrow Obsessions	$\varnothing^5_{13} = \varnothing^8_{13} = 0$	15.57	2	<.0001
	Obsessions \nrightarrow Mood	$\varnothing^1_{21} = \varnothing^3_{21} = \varnothing^5_{21} = 0$	15.14	3	<.01
	Beliefs \nrightarrow Mood	$\varnothing^1_{23} = \varnothing^3_{23} = \varnothing^8_{23} = 0$	11.74	3	<.01
	Obsessions \nrightarrow Beliefs	$\varnothing^1_{31} = \varnothing^3_{31} = \varnothing^8_{31} = 0$	22.14	3	<.0001
3	Mood \nrightarrow Obsessions	$\varnothing^1_{12} = \varnothing^2_{12} = \varnothing^8_{12} = 0$	8.68	3	<.05
	Mood \nrightarrow Beliefs	$\varnothing^2_{32} = \varnothing^7_{32} = \varnothing^8_{32} = 0$	7.7	3	<.06
	Beliefs \nrightarrow Obsessions	$\varnothing^8_{13} = 0$	3.19	1	.08
	Obsessions \nrightarrow Mood	$\varnothing^1_{21} = \varnothing^2_{21} = \varnothing^7_{21} = \varnothing^8_{21} = 0$	12.0	4	<.05
	Beliefs \nrightarrow Mood	$\varnothing^1_{23} = \varnothing^2_{23} = \varnothing^8_{23} = 0$	7.85	3	<.05
	Obsessions \nrightarrow Beliefs	$\varnothing^2_{31} = \varnothing^7_{31} = \varnothing^8_{31} = 0$	9.81	3	<.05

Table 5 (continued)

Patient	Representation of the null hypothesis	Parameter to be constrained ^a	X ²	df	p
4	Mood \nrightarrow Obsessions	$\phi^1_{12} = \phi^2_{12} = \phi^4_{12} = 0$	9.93	3	<.05
	Mood \nrightarrow Beliefs	$\phi^4_{32} = 0$	0.58	1	.45
	Beliefs \nrightarrow Obsessions	$\phi^1_{13} = \phi^2_{13} = \phi^4_{13} = 0$	16.1	3	<.001
	Obsessions \nrightarrow Mood	$\phi^2_{21} = 0$	2.11	1	.15
	Beliefs \nrightarrow Mood		*		*
	Obsessions \nrightarrow Beliefs	$\phi^1_{31} = \phi^4_{31} = 0$	5.22	1	.07
5	Mood \nrightarrow Obsessions	$\phi^1_{12} = 0$	2.07	1	.15
	Mood \nrightarrow Beliefs	$\phi^1_{32} = \phi^5_{32} = 0$	2.55	2	.28
	Beliefs \nrightarrow Obsessions	$\phi^1_{13} = 0$	3.92	1	<.05
	Obsessions \nrightarrow Mood	$\phi^1_{31} = \phi^5_{31} = 0$	5.21	2	.08
	Beliefs \nrightarrow Mood	$\phi^2_{21} = \phi^5_{21} = 0$	2.87	2	.24
	Obsessions \nrightarrow Beliefs		*		*

Six null hypotheses are tested: Mood \nrightarrow Obsessions (i.e., Mood does not precede Obsessions), Mood \nrightarrow Beliefs (i.e. Mood does not precede strength in Beliefs), Beliefs \nrightarrow Obsessions (Beliefs does not precede Obsessions). The three others concern reciprocal determinism: Obsessions \nrightarrow Mood, Beliefs \nrightarrow Mood and Obsessions \nrightarrow Beliefs.

^a "Parameter to be constrained" express which parameter in the autoregressive matrix (ϕ) have to be constrained to test precedence. Superscripts refers to the order of the parameter. Subscripts refers to the position of the parameter in the matrix (line and column, respectively).

* The null hypothesis does not have to be tested. The condition was satisfied exactly by the model when constraints were applied during model estimation.

CHAPITRE 5

CONCLUSION GÉNÉRALE

Les quatre études présentes permettent d'approfondir la compréhension des variables cognitives associées au TOC. / La première étude appuie empiriquement le lien entre la surestimation du danger, la responsabilité, le perfectionnisme et les symptômes obsessionnels-compulsifs (OC). La responsabilité ne représente donc pas la seule distorsion cognitive associée au symptôme OC, comme le propose Salkovskis (1985), / mais constitue un des différents types d'évaluations associés au trouble. La deuxième étude montre que la correction des croyances idéographiques sans aucune forme d'exposition ou de prévention de réponse représente un traitement efficace avec les vérificateurs compulsifs. La troisième étude suggère qu'au moins un des mécanismes impliqués dans le traitement cognitif et le traitement comportemental impliquerait la précedence d'un changement cognitif sur la diminution de symptômes. Utilisant la même méthodologie, la quatrième étude démontre les liens bidirectionnels entre les états émotionnels indépendants, les cognitions et les symptômes. De plus, cette étude suggère que le processus de changement entre l'humeur, les cognitions et les symptômes pourrait être différent entre les patients qui répondent bien ou non au traitement. Les implications seront discutées aux plans clinique, théorique et méthodologique.

/ Un des impacts cliniques importants de cette recherche est d'avoir démontré qu'une intervention cognitive sans aucune forme d'exposition ni de prévention de réponse permet de réduire les symptômes chez les patients de type vérificateur. / Bien que nous ayons obtenu des résultats encourageants avec la thérapie cognitive pure basée sur la correction de la responsabilité dans le

passé, nous avons soulevé la possibilité que d'autres thèmes de distorsions puissent être prédominants chez certains patients (Ladouceur, Léger, Rhéaume, & Dubé, 1996). Le fait d'adapter les interventions cognitives à chaque client en fonction de l'analyse fonctionnelle représente une approche plus souple. D'ailleurs, dans un essai clinique récent, nous avons utilisé l'approche de formulation de cas préconisée par Persons (1996), qui semble bien adaptée à la population OC très hétérogène sur le plan symptomatique. Cette approche permet de formuler des hypothèses sur les variables cognitives et comportementales qui maintiennent les symptômes et le traitement met à l'épreuve ces hypothèses. Si les symptômes persistent, les hypothèses sont reformulées.

Comparativement à l'étude de van Oppen et ses collègues (1995), aucune expérience comportementale n'était permise dans la condition de thérapie cognitive, afin de s'assurer que l'habituation aux symptômes anxieux ne puisse pas expliquer la diminution des compulsions. Cependant, des expériences comportementales sélectives sont reconnues comme des exercices qui peuvent favoriser la remise en question des croyances irrationnelles (Salkovskis, 1995a; van Oppen et al., 1995). Dans de tels cas, le patient est mis au défi de tester empiriquement des croyances spécifiques dans des situations réelles. Il n'y a pratiquement aucune limite à la variété des expériences comportementales avec cette population (pour quelques exemples, voir Freeston, Rhéaume & Ladouceur, 1996). L'utilisation de ces tests comportementaux semble représenter une approche plus complète de la thérapie cognitive (Beck & Weishaar, 1989; Salkovskis, 1995b).

L'étude 4 comprend également des implications cliniques. Dans cette étude, on démontre que les états émotionnels occasionnés par les événements quotidiens de la vie seraient reliés significativement aux symptômes OC et aux croyances chez plusieurs patients. Bien que certains auteurs suggèrent que l'état émotionnel facilite l'accès aux cognitions durant la correction cognitive (Persons & Miranda, 1991), Freeston & Ladouceur (1995) soulignent certains effets néfastes de l'humeur durant le traitement. Dans certains cas où l'humeur est particulièrement problématique, une intervention pharmacologique représente une alternative intéressante (Ladouceur, Freeston & Gagnon, 1998). Enfin, il semble que les manuels de prévention de rechute devraient inclure une explication des différentes façons selon lesquelles l'état émotionnel peut exacerber les symptômes OC, afin de sensibiliser les patients aux moments où ils sont plus vulnérables (Freeston & Ladouceur, 1996).

Les implications théoriques des quatre études sont multiples. D'abord, les traitements appliqués découlent directement des modèles théoriques et fournissent des appuis significatifs à ces modèles. De façon spécifique, le traitement cognitif vient confirmer la pertinence des variables cognitives comme la surestimation de la responsabilité, des conséquences négatives et les attitudes perfectionnistes, en associant un changement cognitif à la diminution des symptômes. L'étude 4 donne aussi un appui à la surestimation de la pensée comme variable pouvant être pertinente chez d'autres patients. De plus, le fait de mettre l'accent sur les processus impliqués représente un effort d'identification des variables responsables du changement. Les résultats des études 3 et 4 mettent en évidence des liens significatifs entre les cognitions et les symptômes. Ils suggèrent la présence de deux mécanismes distincts durant le changement thérapeutique. Le premier implique la précéden

changement cognitif sur la diminution de symptômes. C'est la première fois qu'on obtient un appui empirique pour ce mécanisme chez les patients OC. Le second implique la précérence d'un changement de symptômes sur les cognitions, ce qui appuie la vision de l'exposition de Rachman. Il semble que des différences individuelles considérables existent au niveau de ces processus. Enfin, des études contrôlées avec plus de sujets permettront d'apporter un peu plus de lumière sur ces questions.

Sur le plan théorique, l'étude 4 comporte aussi des implications. Elle démontre que les états émotionnels reliés à des événements de la vie sont souvent associés aux symptômes OC et aux cognitions spécifiques. Les modèles actuels attribuent différents rôles à l'état émotionnel dans le maintien des symptômes OC. Certains le voit comme une conséquence des symptômes tandis que d'autres lui infèrent davantage un rôle prédisposant. Les résultats de la présente étude dégagent différents patrons de relations entre l'état émotionnel, les cognitions et les symptômes, ce qui suggère que l'état émotionnel puisse être impliqué de différentes façons dans la spirale des obsessions. De plus, les patients ayant bien répondu au traitement se sont distingués de ceux qui ont moins bien répondu sur les trois variables. Bien que le nombre restreint de sujets exige une interprétation prudente de ces résultats, ceux-ci semblent justifier des comparaisons ultérieures.

Une des forces méthodologiques de la présente recherche demeure l'importance qui est accordée aux processus impliqués durant le traitement. En effet, bien que nous ayons traité de la question de l'efficacité du traitement cognitif ou cognitif-comportemental pour le TOC, les diverses études de la présente recherche ont toutes visé à examiner les mécanismes responsables du

maintien ou du changement des symptômes. Par exemple, la première étude s'intéresse à la contribution relative de différentes variables cognitives dans la prédiction des symptômes OC. La troisième étude s'intéresse également aux processus de changements cognitifs impliqués dans deux formes de traitements psychologiques. Enfin, la quatrième étude explore les liens entre les états émotionnels, les croyances et les symptômes durant le traitement. Dans l'ensemble ces études ont le mérite d'avoir tenté une démarche empirique visant une meilleure compréhension des processus.

Pour y arriver, la présente recherche a combiné l'utilisation de protocoles à cas uniques à une méthodologie statistique innovatrice. Par exemple, dans la deuxième étude, l'analyse univariée de série chronologique a permis de déterminer si l'intervention a donné des résultats statistiquement significatifs en plus de cliniquement significatifs. Jusqu'à récemment, une des limites des protocoles à cas uniques portait sur le fait que les effets des interventions devaient être importants pour qu'on puisse établir avec confiance si l'intervention était significative (Kazdin, 1992). L'analyse TSA, en plus de détecter des effets thérapeutiques plus petits, précise si l'intervention est graduel ou abrupt. Par ailleurs, dans les études 3 et 4, l'analyse de séries chronologiques multivariée a permis un examen empirique des données sérielles individuelles. Dans l'ensemble, ces études rendent compte à la fois de rigueur et de créativité. Rachman (1996) a récemment soulevé l'importance d'explorer les mécanismes responsables du changement durant le traitement. Salkovskis (1996) quant à lui déplore la surutilisation des comparaisons de groupe pré et post traitement, qui apportent peu d'informations sur les liens entre les différentes variables. Les présentes études représentent un pas dans cette direction.

Le présent travail confirme l'efficacité de la thérapie cognitive avec les patients de type vérificateur. De plus, il identifie certaines variables qui changent durant le traitement. Enfin, il tente d'établir des liens entre ces variables afin de déterminer le rôle relatif de ces variables dans le maintien du trouble. Au niveau des processus, la présente recherche représente une infime portion d'un champ qui demeure à un stade embryonnaire. En identifiant des liens de précedence significatifs entre les cognitions, les symptômes et l'état émotionnel, ce travail rend compte des limites des méthodes actuelles. Mais de façon plus importante, les différents résultats confirment que des croyances spécifiques semblent être reliées aux variations de symptômes et d'humeur chez cette population. Enfin, cette recherche dégage des indices de certaines de ces relations. Beaucoup reste à faire pour en comprendre les éléments communs et idéographiques. Parmi les nombreux défis qui attendent ceux qui se pencheront sur ces questions, on note la mesure souvent difficile de ces variables, le contrôle des effets spécifiques et non spécifiques de traitement et l'hétérogénéité de la population.

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