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A cognitive theory of compulsive checking

S. Rachman *

Department of Psychology, University of British Columbia, 2136 West Mall, Vancouver, BC, Canada V6T 1Z4

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Abstract

It is proposed that compulsive checking occurs when people who believe that they have a special, elevated responsibility for preventing harm, mainly to others, are unsure that the perceived threat has been reduced or removed. The intensity and duration of this checking is determined by three "multipliers": increased responsibility, probability of harm and anticipated seriousness of harm. The recurrency of the checking is promoted by a self-perpetuating mechanism, comprising four elements: paradoxical increases in responsibility and in perceived probability of harm, reduced confidence in memory and the absence of a certain end to the threat.

The relation between compulsive checking and other anxiety disorders is examined and the successes and failures of past or present treatments re-considered. Experimental predictions are set out and the therapeutic implications of the construal are discussed.

1. Introduction

Cognitive interpretations of the anxiety disorders are proliferating. Following the pioneering efforts of Beck (1976) on depression, Clark (1986) and Salkovskis (1985) turned the searchlight onto anxiety disorders, with conspicuous success. Since the publication of their original explanations of panic disorder (Clark, 1986) and of obsessive–compulsive disorders (Salkovskis, 1985), more than 15 years ago, the explanations have become more specific and more detailed, thereby going some way to meeting the criticism that the behavioural theories were insufficiently discriminating. In the recent past we have seen a fountain of new cognitive theories. Explanations have been introduced to account for social phobia (Clark & Wells, 1995), post-traumatic stress disorders (Brewin, 2001; Ehlers & Clark, 2000), "hypochondriasis" (Salkovskis & Warwick, 1986), obsessions (Rachman 1997, 1998), compulsive hoarding (Frost & Hartl, 1996), generalized anxi-

* Tel.: +1-604-822-5861; fax: +1-604-822-6075.
E-mail address: rachman@unixg.ubc.ca (S. Rachman).

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ety disorder (Dugas, Gagnon, Ladouceur, & Freeston, 1998; Wells & Butler, 1997) — and further afield, to account for anorexia (Fairburn, Cooper, & Shafran, 1999).

The aim of the present paper is to introduce a cognitive theory specifically to account for the most common form of OCD, compulsive checking. The theory is a development of Salkovskis's (1985) original work on OCD and is in the style of recent explanations of anxiety disorders, with the emphasis on the central importance of maladaptive beliefs and appraisals, and on the crucial interactions between cognitions and behaviour. A comprehensive account of the phenomenology of compulsive checking, and a review of the results of research on the subject, is provided in the text edited by Menzies and de Silva (2002; see Rachman, 2002), and should be regarded as a companion piece.

It is proposed that compulsive checking occurs when people who believe that they have a special, elevated responsibility for preventing harm, mainly to others, are unsure that a perceived threat has been reduced or removed. They repeatedly check that all is safe. The intensity and duration of the checking is determined by the sense of responsibility, probability of harm, and anticipated seriousness of the harm. The recurrency of the checking is promoted by a self-perpetuating mechanism.

In the introduction to his cognitive analysis of OCD, Salkovskis (1985, p. 571) observed that "obsessional thinking is the archetypal example of a cognitive disorder in the neuroses", and went on to propose that these thoughts "revolve around personal responsibility, the possibility that if things go wrong it might well be the person's own fault" (p. 574). He went on to argue that a major factor in OCD is the inflated belief "in the responsibility of being the cause of serious harm to others or self" (p. 575). A second factor in OCD is that the person "interprets the occurrence of intrusive thoughts, images, impulses and doubts" as revealing and threatening (Salkovskis 1998, 1999). This combination of OCD-related beliefs and maladaptive appraisals lies at the root of the disorder and gives OCD its distinctive qualities. Attempts are being made to establish the nature of these qualities and the interactions of the beliefs and appraisals is a subject of current interest; an International Working Group has made good progress in defining and measuring these cognitions (Steketee & Frost, 2000). The absence of an explanation for the differences between disorders was a weakness of the behavioural approach and hence the current interest in distinguishing between and within anxiety disorders (for reviews of the cognitive approach in general and the available psychometric, experimental and clinical evidence, see Clark, 1997; Craske, 1999; Salkovskis 1998, 1999; Rachman 1993, 1997). The strategic shift from behaviour theory to cognitive theory also involves a change in emphasis, from behavioural maintaining factors to a focus on the person's beliefs and the associated appraisals of perceived threat. The shift towards cognitive explanations led to an accidental re-discovery of phenomenology.

Where does compulsive checking fit into all this?

2. Main features

Compulsions are the most common and most prominent feature of obsessive compulsive disorders, and in many cases they constitute the major problem. Two main compulsions have been identified: checking compulsions and cleaning compulsions. Clinical descriptions of these two types of compulsions were subsequently confirmed by factor analytic studies (Hodgson & Rach-

man, 1977; Rachman & Hodgson, 1980; Van Oppen, Hoekstra, & Emmelkamp, 1995). A psychometric scale, the Maudsley Obsessional Compulsive Inventory (MOCI), was developed to determine the structure of OCD and yielded two stable major factors, checking and cleaning (Rachman & Hodgson, 1980). Constructed in the behavioural era, the scale had good service (Taylor, 1998) but has been replaced by scales that are fuller and include more cognitive items (e.g. Foa, Kozak, Salkovskis, Coles, & Amir, 1998).

Compulsions are repetitive, stereotyped, intentional acts. The necessary and sufficient conditions for describing repetitive behaviour as compulsive are an experienced sense of pressure to act and the attribution of this pressure to internal sources. The occurrence of resistance is an important confirmatory feature, but it is not necessary or sufficient. The compulsions may be wholly unacceptable or, more often, partly acceptable, but are regarded by the person as being excessive, exaggerated, and when judged in calmer moments, senseless. The compulsive behaviour displayed by patients with OCD is motivated, purposeful behaviour — in contrast with the mechanical, robotic, repetitive behaviour observed in other disorders, notably neurological ones. Checking compulsions are carried out in order to prevent future misfortunes, and particularly to protect people from harm; they are a form of preventive behaviour. The compulsions are associated with indecisiveness and doubt. The checking can be overt and obvious or covert and inaccessible to an observer. It can be carried out by proxy, and in one version appears in the form of repetitive pestering requests for reassurance — “Is it safe?”, “Check it for me”. Checking behaviour can be protracted, thereby leading to intolerable slowness and poor time keeping. It is rarely possible to achieve certainty that a future misfortune is completely ruled out, especially as most of the anticipated misfortunes are vague. As it is carried out in an attempt to prevent obscure future misfortunes, the checking behaviour has no natural terminus. So the checking must continue; checking *sans frontiere*. It remains uncompleted.

Checking compulsions, more often than cleaning compulsions, are associated with doubting and indecisiveness, take a long time to complete, evolve slowly, evoke some internal resistance and tend to be accompanied by tension and/or anxiety. The repetitive, intentional execution of these purposeful but irrational actions is within the person’s voluntary control but the urge to carry out the acts can become so strong that they are executed against one’s rational inclinations. The urges tend to provoke subjective resistance, particularly in the early evolution of the disorder, but gradually the person comes to yield to the urges, and the checking becomes stylized and streamlined. In specifiable circumstances, the compulsive activities can be delayed, extended, postponed, reduced — or even carried out for the affected person by a friend or relative. Patients are driven to repeat their behaviour, such as washing their hands over and over again, almost always with the purpose and expectation of gaining some relief from their discomfort or anxiety. The compulsive behaviour is a source of considerable distress and people experience a sense of reduced volition, but the compulsive activity is repeatedly reinforced by its temporary anxiolytic properties. If the compulsive activities are particularly intense and/or extensive they can become disabling as well as distressing. These disabling/distressing qualities distinguish them from the so-called normal compulsions (see Muris, Merckelbach, & Clavan, 1997; Frost et al., 1986; Sher, Frost, Kushner, Crews, & Alexander, 1989).

The classical examples of compulsive behaviour are repetitive and excessive cleaning and comparably stereotyped checking, especially to ensure safety in the home and at work (for example, by repeatedly checking the safety of the stove, doors, windows). Many people with obsessive

compulsive disorder have elements of both of these forms of compulsions; people who display cleaning compulsions often will have some stereotyped checking behaviour, but compulsive checking may occur in the absence of any compulsion to clean. Information about the relative frequencies of the main forms of compulsion is incomplete but it appears that compulsive checking is more common than compulsive cleaning, perhaps in the ratio of 4:3 or 6:3 (Antony, Downie, & Swinson, 1997; Henderson & Pollard, 1988). In a questionnaire study of OCD symptoms nearly half of the OCD respondents reported compulsions without obsessions, and 32% reported obsessions without compulsions (Welkowitz et al., 2000). The results of a community study in central Canada produced comparable figures and it was also found that "the most common compulsion was checking (15.1%)" (Stein, Forde, Anderson, & Walker, 1997).

Clinical examples of checking include the following. A 28-year-old patient had checking compulsions that were precipitated by a fear of harming others. He was unable to drive his car as this provoked intolerable thoughts and checking compulsions. He also avoided crowded streets for fear of causing harm to others. He repeatedly checked razors, pins, glasses and so on. A 34-year-old married woman had checking compulsions that were precipitated by contact with other people. Looking at or talking to people or giving them food led to checking behaviour in order to ensure that no harm came to them (providing food for other people to eat is a common source of anxiety for affected people, and in one instance we had a patient who was unable to even boil a kettle of water for tea unless she was accompanied by a trusted adult). A 36-year-old single man had checking compulsions that focussed on excrement and he engaged in prolonged and meticulous inspection of any speck of brown particularly on his clothes and shoes. A 40-year-old nursery school teacher checked that all rugs and carpets were absolutely flat lest someone trip over them and spent long periods looking for needles and pins on the floor and in furniture. She repeatedly checked to ensure that all cigarettes and matches had been extinguished, and so forth. A 30-year-old male nurse was incapacitated by repeated checking behaviour. He had to ensure that no one had been inadvertently locked in a room, or trapped in a manhole, or that babies had been dumped in the bushes, and so on. A 40-year-old man had to retrace many of his motor car trips in order to check that he had not injured anyone inadvertently. A 28-year-old woman teacher spent up to 3 h each night checking the doors, gas taps, windows, plugs and switches before going to bed. A 45-year-old married television technician spent up to 2 h checking the taps, doors, windows, electrical plugs, etc. of his flat before he was able to leave for work. A 35-year-old married woman repeatedly checked with the police to ensure that she had not caused any accidents. A 19-year-old clerk carried out 4 h of checking after other members of his family retired at night. He checked all the electrical appliances, doors, taps and so on and was not able to get to bed before 3 or 4 o'clock in the morning.

> Some of the notable features of checking compulsions include the following: most checking occurs predominantly in the person's own home, most compulsive checks are carried out when the person is alone; the compulsions appear to intensify when the person is depressed, they are most intense when the person feels responsible for the act concerned, or put another way if they feel they are not responsible they seldom engage in intense checking compulsions (Rachman, 1976, p. 270).

In addition to the overt compulsive checking that people engage in, they are much inclined to

avoid situations which are likely to produce the anxiety or discomfort that will trigger compulsive checking. Furthermore, many of the affected people engage in neutralizing activities, some of which are covert, in an attempt to put matters right. They attempt to reduce the subjective discomfort and/or reduce the likelihood of a nasty event occurring, or attempt to reduce the effects of any nasty event that might occur. Neutralizing acts often provide transient relief, but they are thought to make an unfortunate contribution to maintaining the problem. Neutralization is best regarded as a variant of compulsive checking because both of them are aimed at cancelling the effects of the person's thought or action or most commonly, an attempt to prevent the feared event from occurring. In his cognitive analysis of OCD, Salkovskis (1985, 1998) attaches considerable significance to the role and effects of neutralization and connects it to the concept of inflated responsibility and the need for reassurance. Neutralization, compulsive acts and reassurance-seeking share some common features and all can be construed as attempts to reduce the probability of a nasty event occurring or to reduce the effects of such an event. They also serve to reduce one's responsibility for any such anticipated misfortune. The clinical implications of neutralization are described by Salkovskis and Kirk (1997), and an account of checking compulsions is available in Rachman (2002).

3. The theory

Compulsive checking occurs when people who believe that they have a special, elevated responsibility for preventing harm feel unsure that a perceived threat has been adequately reduced or removed. In their attempts to achieve certainty about the absence or the unlikelihood of harm occurring, people with high responsibility repeatedly check for safety. Paradoxically, these attempts to check for safety can produce adverse affects that turn the checking behaviour into a self-perpetuating mechanism.

4. Self-perpetuating mechanism

Recognition of this self-perpetuating mechanism is essential in attempting to explain why compulsive checking is compulsively repeated. Why is it recurrent? Only four elements of the mechanism have been identified so far; they will need to be confirmed, expanded and integrated.

The first element is the unsuccessful search for certainty that the probability of harm to others/self has been reduced or removed. Certainty that the prevention of a future misfortune has been successful is rarely possible because one can seldom achieve certainty about future events (of this type). The perceived threats can be obscure; they tend to be general, hazy, unlimited in time or in space, and even the identity of the potential victims may not be known. For these reasons, it is claimed here that compulsive checking has no natural terminus. No certain end. And if this checking for the prevention of harm has no natural end, the search for safety simply continues. At least three other elements enter into the recurrency of compulsive checking.

The second element in the self-perpetuating mechanism is that the repeated checking tarnishes the person's memory of the checking and hence makes the achievement of certainty less likely not more likely. For with repeated checking, the person's confidence in their recall of checking

(and its effects?) *declines* (Tolin et al., 2002). The more checking you do, the less confidence you have in your memory of the checking. Consistent with this observation, Radomsky, Rachman, and Hammond (2001) found that compulsive checkers expressed significantly less confidence in their memory for checking actions that were carried out under high responsibility than they did for comparable actions that were carried out under conditions of low responsibility. This direct loss of memorial confidence when responsibility goes high is another contributor to the self-perpetuating mechanism, and it may also strengthen the maladaptive interpretation of the memory problem as a sign of mental deterioration.

The third element is a cognitive bias in which people feel that the probability of harm occurring is elevated when they are responsible, when they are in charge or on duty (Lopatka & Rachman, 1995). A group of compulsive checkers rated the likelihood of misfortune as greater when they had high responsibility than when they carried lower responsibility (59% likelihood during high responsibility vs 25% likelihood in the low responsibility condition). These same participants rated the seriousness of the feared harm as greater under high responsibility than under low responsibility (73% seriousness in the high condition vs 43% in the low responsibility condition). The fourth element in the self-perpetuating mechanism is another cognitive bias, encountered in the same study, in which people experience an *increase* in personal responsibility after they have completed a check for safety. It remains to be determined whether the repeated cycles of compulsive checking produce incremental, and cumulative, inflations of responsibility. If they do, then they might contribute to the self-perpetuating mechanism in the long term as well as in the short term. It is even possible that pre-compulsive normal episodes of checking contribute to the very development of compulsive checking. For example, if a person is required to carry out repeated checking at work or at home, especially to check for safety, this may promote inflated responsibility, a perceived increase in danger, and a loss of confidence in their memory of the checking cycle and its efficacy.

5. Multipliers

Pursuing this argument that compulsive checking occurs when people who believe that they have special responsibility for preventing harm feel unsure that a perceived threat has been dealt with, we can turn attention to factors that multiply the checking. One important "multiplier" is the person's perceived responsibility — if it rises, the compulsive checking is increased. A second "multiplier" is the perceived probability of the feared harmful event occurring — an increase in the perceived probability of the event will increase the compulsive checking. Interactively, the perceived probability of the feared event occurring is elevated when the person is in a position of responsibility for ensuring safety. A third "multiplier" is the perceived severity or "cost" of the feared harmful event — an increase in the perceived cost will increase the compulsive checking. Changes in one, two or all three multipliers, will substantially increase or decrease the compulsive checking. However, only one of the three multipliers is essential for the equation. If the person's perceived responsibility is substantially reduced or even removed, little or no compulsive checking will take place, regardless of the status of the remaining two multipliers. The relations between the multipliers are schematically illustrated in Fig. 1.

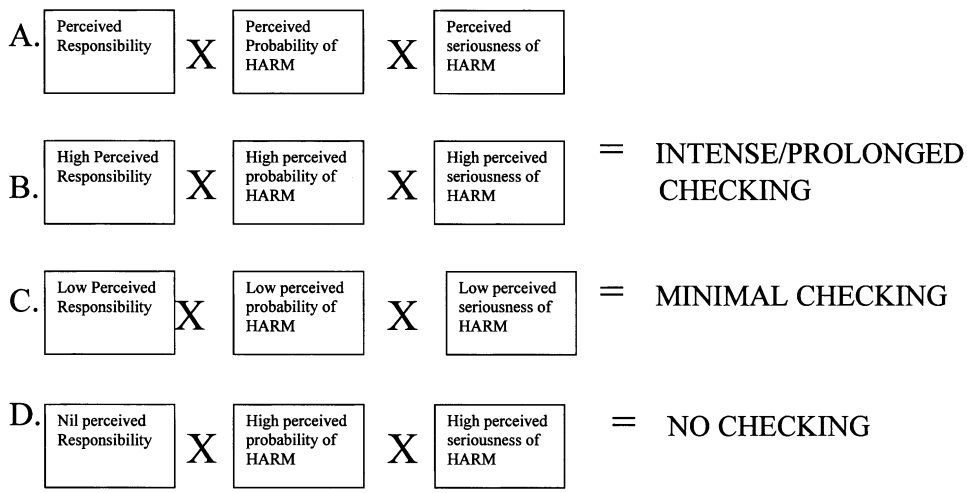

Fig. 1. Intensity and duration of checking.

6. Memory

A curious feature of compulsive checking is the apparent impairment of memory that is associated with this disorder. Affected people complain that they have great difficulty remembering whether or not they have checked the stove, whether or not they have remembered to engage the parking brakes on their car, or locked the front door. This apparent failure of recall occurs to them repeatedly and can even occur on the very same checking task. At the outset it should be said that in many instances they have difficulty remembering whether or not they have completed the task *safely*, not whether or not they have carried out the task at all. "Yes, I remember that I did check the stove but I cannot remember if I checked it satisfactorily. Was the switch fully turned off? I cannot remember if it is safe". In another example, "Yes, I remember going out to the car to check the hand brake, but cannot recall whether I checked it adequately, safely". There is a controversy over whether or not compulsive checkers, and perhaps all OCD patients, suffer from a general impairment of memory, possibly or probably in the nature of a neuropsychological deficit (see Rachman, 2002; Rachman & Shafran, 1998).

The psychometric evidence on memory performance in OCD and non-OCD people is inconsistent, but clinically it is evident that most patients with OCD, and compulsive checkers in particular, even those who experience difficulty in recalling details of their specifically compulsive activities, can comfortably carry out neutral mental tasks at work and at home, even when these tasks call on considerable memorial resources. Professors, scientists, computer experts, lawyers, even psychologists who engage in compulsive checking do not complain of a general memorial deficit that impairs their work. They may fear the prospect, but it is not common for compulsive checkers to complain that they cannot remember work-related details, family or social news and events and so forth. Clinically the memorial difficulty appears to be specific, and even to disappear when responsibility is removed, reduced or transferred (see for example the experiments of Radomsky & Rachman, 1999; Radomsky et al., 2001). In the second of these studies compulsive checkers who experienced some difficulties in recalling whether or not they had completed their checking activi-

ties carried out in their own homes, had no such difficulty recalling what they saw in a video that had been prepared of their actual checking when it was shown to them in the laboratory after an interval of a week. In this neutral condition, with no responsibility, the difficulties in memory disappeared.

An adequate cognitive theory of compulsive checking must accommodate the memory problem. The reasons why compulsive checkers experience difficulty in recalling details of their safety checking appear to be as follows. In circumstances that elicit compulsive checking, the interactions of the multipliers increase the person's anxious arousal, which impairs the recalling of the specific events; most of their attention is focused on the threat and on a scanning of their emotional reactions to the threat. The poor recording of the specific details of a compulsive check, and subsequent difficulty in recalling it, is interpreted by the affected person as evidence of a personal and significant inadequacy or abnormality of the "I am losing my mind" variety. It is interpreted by the affected person as meaning that "I am really, really stupid".

As mentioned earlier the problem is then exacerbated by a triggering of the self-perpetuating mechanism. The checking itself undermines the person's confidence in their memory, thereby strengthening the maladaptive interpretation of the personal significance of the memory problems. "I have an abnormally poor memory and now I have lost all confidence in my memory. This means I am deteriorating mentally".

Consistent with this cognitive approach to compulsive checking, the memory deficit is now construed as an (anxious) interference in recording of specific details of preventive behaviour which is then misinterpreted as evidence of abnormality, of mental deterioration or of inadequacy. In the case of a highly successful lawyer who engaged in compulsive checking and had great difficulty in remembering whether or not he had completed his checking cycles, he felt that his mind was deteriorating and that he would have to give up his legal practice within a year. These maladaptive interpretations are strengthened by the checking-induced actual loss of confidence in one's memory, and more broadly by the self-perpetuating mechanism.

Following this construal, the memorial problems experienced by compulsive checkers can be eliminated by some inter-connected steps. Attempts can be made to reduce all of the multipliers, with particular and primary emphasis on inflated responsibility. This can be attempted by constructing behavioural experiments, and by promoting the reduction or sharing or transfer of responsibility. The successful reduction of responsibility will of itself impact on the memory problem. In addition, energetic cognitive therapy attempts should be made to modify the patient's maladaptive misinterpretations of the personal significance of the specific lapses of memory, and of the specific out-of-control bizarre behaviour. Thirdly, attempts should be made to unravel and dismantle the self-perpetuating mechanism. Here the tried and true second component of behaviour therapy is the best tool — namely, response prevention.

7. The successes and failures of past treatments

Does this cognitive construal help us to understand the effects of past treatments? The most successful psychological treatment, one could even say the only successful psychological treatment of OCD, is behaviour therapy and its successor, cognitive behavioural therapy. Behaviour therapy has the two familiar components of exposure and response prevention. It should be said

that the absence of the relevant dismantling experiments make this uncertain ground to enter but it would appear that the first component of behaviour therapy, exposure, had only slight therapeutic effects. Given the importance now attached to the role of responsibility, there is no good reason why exposure should have had a large impact. Exposure as such has no direct effect on the belief in one's special responsibility for protecting people and oneself from harm, other than a possible *increase* in responsibility. However the second component of behaviour therapy, response prevention, makes good cognitive sense. As argued above, the very execution of compulsive checking strengthens the self-perpetuating mechanism by increasing responsibility and hence increasing the perceived probability of danger, and also by impairing confidence in one's memory. The at least moderate success achieved in treating compulsive checking by behaviour therapy is probably attributable to the response prevention component. However, even this left untouched the primary cognitive element in compulsive checking, namely the belief that one has a special, elevated responsibility for protecting others/self from harm. It is not addressed directly in behaviour therapy. In cognitive behaviour therapy, however, it becomes of central importance to do so.

The second cognitive element in compulsive checking, the patient's maladaptive cognitive misinterpretations of the personal significance of one's out-of-control, bizarre repetitive behaviour, and of one's impaired memory, are likewise left unaddressed in behaviour therapy. However, in cognitive behaviour therapy, attempts to modify these maladaptive cognitions must occupy a place second in importance only to tackling the core belief that one has a special, inflated responsibility for protecting others/self from harm. The two cognitive prongs of CBT, the reduction of inflated responsibility and of maladaptive cognitions regarding behaviour and memory, did not feature in behaviour therapy and must now be supposed to add critical new components to treatment that should lead to superior therapeutic results. The response prevention component is common to behaviour therapy and cognitive behaviour therapy and should be retained because of its power to disrupt the self-perpetuating mechanism. The CBT that is deducible from the theory comprises an introductory didactic part and three other components: (a) reduction of the core belief of inflated special responsibility for protecting others/self from harm; (b) modification of the maladaptive cognitive misinterpretations of one's out-of-control bizarre behaviour and the impaired confidence in one's memory; and (c) use of response prevention tactics.

8. The relation of compulsive checking to other disorders

What is the relation between compulsive checking and the two other main forms of OCD? In cognitive terms obsessions arise from the catastrophic misinterpretation of unwanted, intrusive, repugnant thoughts as being of great personal significance, and of revealing that one is "mad, bad, dangerous" (Rachman 1997, 1998). These misinterpretations cause distress, impaired concentration and self-doubt, and result in interminable internal debates, neutralizing behaviour and avoidance. Among compulsive checkers the person misinterprets the significance of their powerful urges to check and re-check for safety from harm as personally significant, out-of-control, bizarre behaviour, and the associated impairment of memory is also interpreted as being of high personal significance. The role of responsibility is critical in compulsive checking but not in obsessions.

In both forms of disorder, the slight but transient relief of anxiety that follows the compulsive behaviour (neutralizing, checking etc.) helps to strengthen the abnormal behaviour. In compulsive

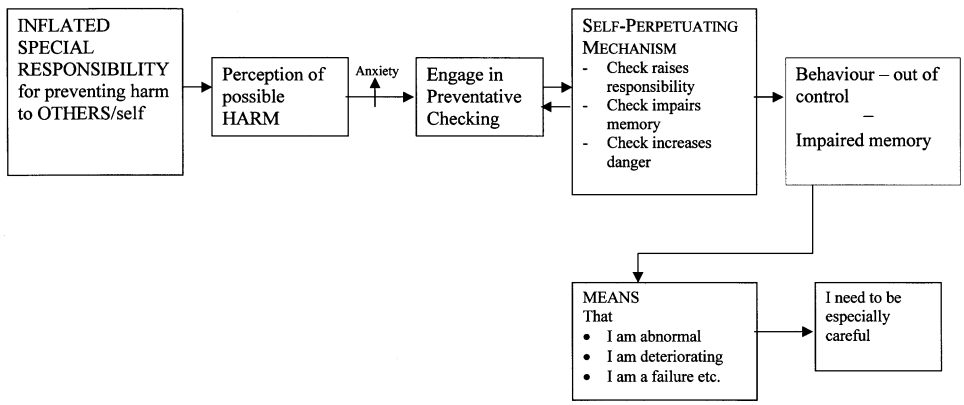

Fig. 2. Compulsive checking.

checking there are indications of the operation of a self-perpetuating mechanism but the operation of a similar mechanism in obsessions remains to be explored (see Figs. 2–5).

Compulsive cleaning resembles compulsive checking because in both disorders the compulsive urges to repeatedly carry out actions are seemingly intended to reduce harm. In instances of cleaning however, the aim is to remove the harm that has possibly occurred (e.g. remove germs) and in compulsive checking the behaviour is intended to prevent some future harm. Compulsive checking is intended to prevent harm occurring to others principally, but sometimes the thoughts are of harm coming to oneself. In compulsive cleaning, however, the balance is primarily towards protecting oneself from harm (via disease, pollution etc.) and less often, usually secondarily, it is intended to protect others. The dividing feature is the direction of the belief in special responsibility; in compulsive checking the special responsibility is mainly to protect others from coming to harm, in compulsive cleaning it is mainly to protect oneself from harm.

Hypochondriasis, or health anxiety as it is now more properly called (Salkovskis 1985, 1998), is an interesting phenomenon because it combines elements of compulsive checking and compulsive

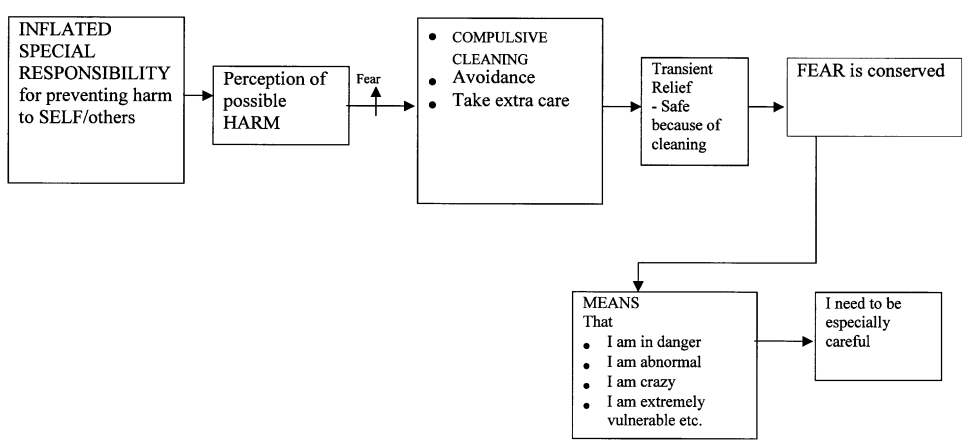

Fig. 3. Compulsive cleaning.

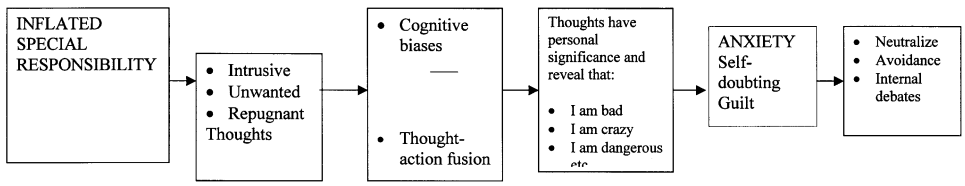

Fig. 4. Obsessions.

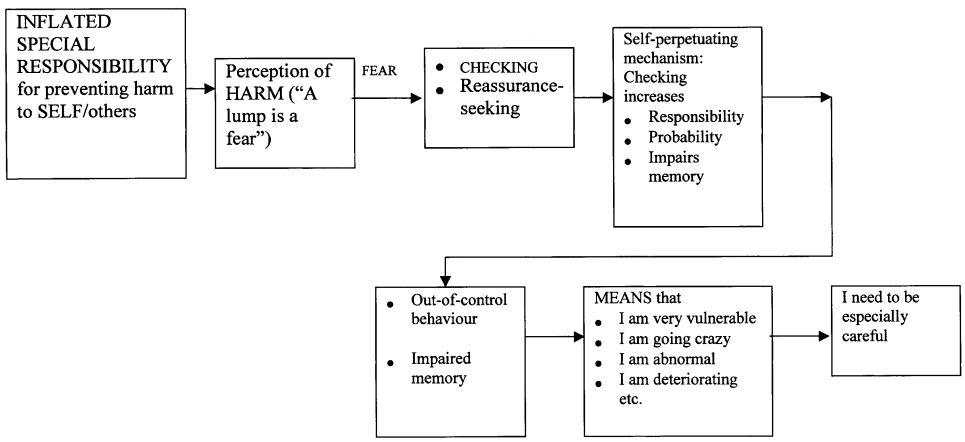

Fig. 5. Hypochondriasis (health anxiety).

cleaning. The affected person believes that he/she has a special responsibility for preventing harm, but it is essentially a threat of harm to oneself in the form of serious threats to one's health. For many years, the three-system approach to the nature of fear was summed up in the observation that "fear is not a lump" (Lang, 1970; Rachman, 1980). However, in hypochondriasis it is often the case that "a lump is the fear". The perception of a bodily change such as a lump generates great fear and subsequent preventive/checking behaviour which includes repeated requests for reassurance. The checking behaviour triggers a self-perpetuating mechanism similar to that described for compulsive checking, and comprising the same four elements (no natural terminus, increases in responsibility and hence increased probability of danger, impaired confidence in memory). The out-of-control checking behaviour and accompanying impairment of memory in hypochondriasis are interpreted as signs of inadequacy and special vulnerability (e.g. if I am so fearful there must be a danger present — see Arntz, Rauner, & Van den Hout, 1995). The increases in responsibility and in vulnerability fuel repetitive checking behaviour and requests for reassurance.

The requests for reassurance about one's health come thick and fast and usually are attempts to find safety from harm, even though they have the appearance of requests for information — "Will I be alright? Is this blemish on my hand cancerous?" The information requested rarely contains anything new (and the patient almost always knows the answers in advance) but the requests are made in vain attempts to reduce the health anxiety. Comparable to other forms of compulsive checking, these repeated requests for reassurance are capable of producing partial and transient reductions in anxiety and one can presume that these intermittent squirts of relief

strengthen the compulsive checking, Mowrer style. If the recurrent requests for reassurance are ignored they should be extinguished by a process of non-reinforcement. Such extinction, however, is probably person and situation specific. In practical terms, "I no longer mention my health worries to X because she pays no attention, but Y is a sympathetic listener and tries to calm me down".

9. Implications and predictions

A slew of experimental predictions are deducible from the theory. An analysis of the "multipliers" leads easily and directly to experimental testing. It is predicted that the intensity (and the duration) of compulsive checking will increase markedly when one,or more, of the three multipliers is raised (see Fig. 2). Conversely, the intensity/duration of compulsive checking will decline when any/all of the multipliers is lowered. The increases that are predicted to occur when the multipliers are raised will be steeper than the decreases that are predicted to occur when the mutipliers are lowered, even when the percentage changes in the multipliers are identical. It is further predicted that reductions in the checker's perceived responsibility will be followed by decreases in compulsive checking. Increases in perceived responsibility will be followed by increases in the intensity/duration of compulsive checking. Even when the percentage changes in perceived responsibility are identical, the changes that follow an increase in responsibility will be steeper than the changes that follow a decrease in responsibility. Under controlled conditions, if the checker's perceived responsibility is eliminated the compulsive checking will cease.

Several predictions can be drawn from the postulated self-perpetuating mechanism. Increases in the frequency/duration/intensity of compulsive checking will be followed by increases in (a) perceived responsibility, (b) the perceived probability of a harmful outcome, (c) the estimated seriousness of the harmful outcome, and (d) a decline in confidence of one's memory for the checking activity. Conversely, decreases in the frequency/duration/intensity of compulsive checking will be followed by reductions in (a) perceived responsibility, (b) perceived probability of harmful outcome, (c) estimated seriousness of harmful outcome, and (d) an improvement in confidence of one's memory for the relevant activity.

10. Therapeutic implications

What are the therapeutic implications of the present construal? It leads to the construction of a highly focused four-component treatment which incorporates the familiar treatment tactics into a firm framework, in which each component has a specific role and a specific justification. The omission of any component will have specific effects (see below).

The first component of the derived treatment is didactic. Compulsive checking is described as excessive behaviour that is intended to reduce misfortune/harm coming to other people, or less often, to oneself. The critical role of inflated responsibility is explained and attention is drawn to the types of maladaptive misappraisals that are associated with compulsive checking (weird, out of control, deteriorating, etc.). The determinants of the intensity/duration of compulsive checking

are adumbrated and the operation of the self-perpetuating mechanism is described. An explanation is offered for the mysterious loss of confidence in memory.

The second component of treatment is the tussle with tenacious responsibility. The current methods (e.g. transfer, delay, deflate etc.) are still too diffuse and insufficiently forceful, and are in need of improvement (Ladouceur, Leger, Rheaume, & Dube, 1996; Rachman, 1993). (The tenacity of inflated responsibility also needs to be explored and explained.)

The third component, attempting to modify the maladaptive and even catastrophic misappraisals of the significance of the compulsive checking, follows the usual CBT lines, with an emphasis on behavioural experiments. The fourth component is the traditional tactic of response prevention.

Each of the four components of treatment is designed to deal with a specific aspect of compulsive checking. The didactic component informs and primes the patient, the deflation of responsibility reduces the perceived need to prevent harm and misfortunes, the modification of the misappraisals reduces any anxiety/discomfort, and the response prevention component disrupts the self-perpetuating mechanism and secondarily normalizes the person's self-appraisals (I am out of control etc.). Hopefully, the full implementation of the focused components should produce the predicted changes and lead to superior therapeutic results.

11. Therapeutic predictions

Consistent with the experimental predictions set out for the multipliers, self-perpetuating mechanism and so forth, a therapeutic reduction of inflated responsibility (over a wide range of situations and circumstances) will produce a clinically significant decline in compulsive checking. The reduction of the misappraisals of the personal significance of the blurred memories, loss of control over behaviour, will reduce the patient's anxiety. The blocking of the checking itself will reduce the perceived likelihood/seriousness of any anticipated harm and help to restore confidence in one's memory.

The therapeutic predictions are specific — changing the misappraisals should have the greatest effect on anxiety. Response prevention should reduce responsibility and recurrency, and lower the estimates of harm. A deflation of responsibility should reduce anxiety and compulsive checking. The omission of response prevention will slow recovery, but failure to deal with inflated responsibility may prevent it. Changing the misappraisals without using response prevention and without lowering responsibility will not produce dependable and significant reductions in compulsive checking.

To sum up, it is proposed that compulsive checking occurs when people who believe that they have a special, elevated responsibility for preventing harm are unsure that a perceived threat has been reduced or removed. The intensity and duration of the checking is determined by three "multipliers"; responsibility, probability of harm, seriousness of harm. The recurrency of the checking is promoted by a self-perpetuating mechanism, comprising four elements.

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