INFERENCE PROCESSES IN OBSESSIVE-COMPULSIVE DISORDER: SOME CLINICAL OBSERVATIONS

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Summary—In this paper we outline a cognitive model of Obsessive–Compulsive Disorder (OCD) which proposes that the core belief of OCD evolves through a series of illogical inferences. These faulty inference processes involve inferring the plausibility of events on the basis of irrelevant associations, dismissing actual evidence on the grounds of going beyond surface reality to a deeper reality, and finally inferring that a completely fictional narrative is a remote probability. A therapy aimed specifically at changing these inference processes is illustrated with case examples of OCD clients who had not benefited from conventional behavior therapy. The inference based approach (IBA) complements existing cognitive–behavioral therapy but suggests that in certain cases, the conventional cognitive therapy view of OCD beliefs as exaggerated fears of remote possibilities may actually reinforce the obsessional belief since even remote events are real. The IBA on the contrary suggests that an important goal in therapy is to highlight this confusion found in OCD between imagination and reality and illuminate for the OCD client how their compulsions, far from reassuring them about a remote possibility, actually take them further away from reality and reinforce their imaginary doubt.

INTRODUCTION

The aetiology of OCD remains unclear although both early socialization experiences and neurophysiological factors seem to contribute to its development. Parental rearing style in particular dimensions of parental affection and parental control have been associated with OCD (Gersmla, Emmelkamp & Arrindell, 1990). Soft neurological signs, particularly involving frontal regions, have also been reported in OCD (Hollander, Schiffman, Cohen, Rivera-Stein, Rosen, Gorman, Fyer, Papp & Liebowitz, 1990). Both psychopharmacological and psychological interventions have proved partially effective in the treatment of OCD but neither has shown itself to be 100% effective, and there are wide individual differences in response to both treatments. The consensus seems to be that both drug treatment and cognitive–behavioral psychotherapy are more beneficial as active treatments than placebo. Although a recent meta analysis of treatment effect size by van Balkam, van Oppen, Vermeulen, Dyck, Nauta and Vorst (1994) favoured the efficacy of behavior therapy in OCD over serotonergic antidepressants when measured on self-rating instruments. The most effective psychological treatment to date is exposure with response prevention (E + RP).

Clinical problems with E + RP

A major therapeutic problem with the exposure model is that it rarely eliminates all of the rituals and associated obsessional beliefs. Even long standing programs, such as the one run by Marks at the Maudsley Hospital in London, report that success for the majority of clients stands at around 75% of reduction in frequency of compulsions (Thornicroft, Colson & Marks, 1991). In addition, a further 25% or so, do not profit from the treatment mainly because they are unable to comply with the exposure and response prevention. The main reason for non-compliance is that the anxiety experienced during exposure is intolerable, even if exposure is preceded by covert desensitization or carried out in a graded fashion with the therapist.

It is important in discussing the efficacy of exposure for OCD to distinguish between core beliefs and secondary beliefs following from the core obsessional belief. In the case of OCD, the primary
belief might be of the kind “Now I’ve shaken hands my fingers are contaminated” the thoughts consequent on these first thoughts would be “Now I must wash my hands or they will contaminate someone else or I will be extremely uncomfortable”. It seems that though exposure may well reduce the impact of secondary thoughts, it does not affect primary beliefs. The exposure model addresses the anxiety associated with the consequences of the obsessional belief. It does not aim to dislodge the fundamental belief itself. Indeed studies (Lilliot, Noshirvani, Basoglu, Marks & Monteiro, 1988) examining change in beliefs after behavioral treatment show a change only in belief in consequences, not in core belief. The tendency of clients in this case is to still adhere to their conviction (e.g. “I still believe this table is dirty”) but to be less inhibited in their subsequent actions (e.g. “I guess if I have to touch the table I can”).

Cognitive formulations of OCD

Despite recent cognitive reformulations of Obsessive–Compulsive Disorder (OCD) emphasizing the centrality of core beliefs (e.g. Rachman, 1993), exposure with response prevention remains the cognitive behavioral treatment of choice for OCD. Cognitive therapy, by itself seems to add little or nothing to clinical outcome (Emmelkamp & Beens, 1991). The type of cognitive therapy (CT) tried with cases of OCD has generally been of the traditional kind using rational emotive or Beck style challenges to the reasonableness or rationality of thoughts, beliefs and expectations. The cognitive challenge generally follows the line that the obsessional holds a disproportionate belief in harm or illness occurring and an exaggerated sense of responsibility for these events occurring (Salkovskis, 1985). In other words the client overestimates the probability of aversive events and therapy is adapted from the same approach used with anxious and depressed clients (van Oppen & Arntz, 1994).

Support for such a traditional cognitive approach comes from recent cognitive research suggesting that it may be the person’s aversive evaluations of their intrusive thoughts which is responsible for their anxiety rather than the nature of the thoughts themselves. A number of studies of intrusive thoughts in the normal population have reported that even morbid preoccupations associated with OCD are also present in non-clinical populations (Purdon & Clark, 1994), but that it is the guilt reactions of the OCD to these ideas and the secondary appraisal that they are uncontrollable that leads to attempts to suppress the thoughts. These attempts to efface or neutralize the thoughts then elevate attention to the thoughts and guarantee their continued intrusiveness.

Essentially, according to this cognitive model, the obsessional’s anxiety is seen as a catastrophic reaction to a normal stimulus or event, and in this way is similar to the covariation bias reported in phobics, where the relationship between an object and certain emotive consequences is grossly exaggerated. The compulsive ritual following on from the obsession is viewed as a way of neutralizing or avoiding or countering the exaggerated aversive consequences, in the same way that phobic avoidance can be viewed as a ritualized way of diminishing exposure to anxiety. Data supporting this cognitive hypothesis have tended to come from studies of obsessional ruminators or those with covert neutralizing rituals. There is some evidence in the literature that obsessive ruminations share characteristics with worry, and hence may form a dimension with generalized anxiety disorder (Freeston, Ladouceur, Rhéaume, Letarte, Gagnon & Thibodeau, 1994).

An alternative cognitive approach to obsessional ideation views these beliefs as a form of delusion or overvalued idea and hence suggests that the core beliefs rather than just the reactions to these beliefs should be modified. This raises the possibility that there may be two distinct types of OCD clients, those for whom traditional cognitive behavior therapy (CBT) may help overcome exaggerated reactions to normal intrusive thoughts, and those whose core beliefs are more of a delusional nature and for whom traditional CBT is not helpful.

In a series of recent case studies of chronic OCD clients who had not benefited substantially from traditional CBT (or other treatment) we came to the conclusion that conventional CT is not only inappropriate for certain types of OCD but may be counterproductive and reinforce the condition. The principal basis for this assertion is our finding that the inference processes involved in perpetuating the OCD belief system are not at all similar to those producing distorted beliefs in areas of anxiety and depression for which CT was initially developed.
Inference processes in OCD

Conceptual problems applying CBT model to OCD with overt rituals

The main conceptual problem with this CBT exposure model of treatment processes is that, contrary to assumption the obsessional belief does not in any way resemble a phobia. In other words what appears to be the source of anxiety (dirt, contamination, insecurity, uncertainty) is not in reality a phobic object to the OCD person. The OCD person does not fear 'real dirt' in the way a spider phobic for example fears a real spider. If obsessions followed a phobic model of development then the obsessional aversion should be first and foremost towards a real object at least until the obsessional's exaggeration of the danger makes this aversion unreal. But it is not the real features of an object, but what this form represents for the OCD client, which is at the root of the obsessional fear. Rachman (1994) has underlined this symbolic nature of "dirtiness" in some patients with cleaning compulsions and terms their problem, "mental pollution". Mind pollution is distinguishable from genuine anxieties about dirt, since the pollution is observable only to the patient.

Aversion to the object or state of affairs, in question, depends on other factors remote from the objective qualities of the object. The anxiety of the OCD client is never actually towards the simple presence of the phobic object rather the aversive potency is conditional. Several clinical observations support inconsistencies in the notion of a parallel between phobic aversion and OCD. The inconsistencies show up in 4 different forms, firstly the person with OCD is generally not afraid of a consistent objectively classifiable categories of objects, e.g. a simple phobic will avoid all spiders or all heights, or all public speaking engagements. The OCD person is very selective within a stimulus category, or alternatively classifies membership of the category on an illogical basis. For example a client who said she was averse to touching anything dirty, defined “dirt” very selectively and was not averse to touching mud, excrement, chalk, paint, etc . . . She washed her hands meticulously after any contact with some objects but was not at all bothered when her hands become covered in chocolate or mud. Another person with a fear of causing a fire meticulously checked pieces of paper left on a table to make sure they were not close enough to the radiator to cause a fire, yet forgot to turn the light off before leaving the house and was unconcerned with whether the stove was left on or off.

The second inconsistency in the notion that OCD is an exaggerated form of phobic avoidance is that the selective categorization of aversive stimuli mentioned above is generally by association with another theme. As an example, the client who was selective about dirt, considered dirt classifiable as dirt only if it was associated with a certain class of person. Rachman (1994) has previously noted in his cases of "mental pollution" that a moral or other subjective theme frequently underlies aversive associations.

The third inconsistency is that OCD clients rarely regard the reality in front of them and may not even be aware of it when avoiding the aversive object. In fact, frequently they will not even be able to describe concretely what it is they are washing off or avoiding or neutralizing. A man who was preoccupied with ants and who was constantly checking for their presence could not even remotely accurately draw or describe an ant. His cue for seeking ants was not the physical likelihood that ants or any other insect would be present, but an idea drawn from a memory of another time and place that was associated with ants. The cue in other words was based on a past reality not a present reality. For the client afraid of being contaminated by objects her simply being in the vicinity of what she defined as "dirt", convinced her that her hands needed washing, and she could not even bear to look at them to see what was there before she washed them.

Fourthly following on from point 3, one finds that the aversion to a specific object is embedded in a running narrative that is from beginning to end grounded in an imaginary story of what is there, might be there and will be there and what will be the ensuing consequences. In other words an imaginary sequence of events is imposed on reality and the person reacts as though that imaginary sequence were true.

Contrary to the notion of a parallel between phobia and OCD, the above clinical evidence suggests that the person reacts not to what is there, and not even to the exaggerated consequences of what is there, but to what might possibly be there even though the person's senses say otherwise. In the person's eyes what they imagine may be there becomes a real probability, when it is in fact pure imagination. The OCD fear then is sustained not by the sight of an object, person or situation,
but by an imaginary narrative which convinces the OCD client of the reality or real probability of what is in fact complete fiction (or sometimes science fiction, since frequently the laws of science are misused to back up the fiction).

This hypothesis that an imaginary narrative guides the OCD clients actions is further supported by the paradox that the OCD client fears not what they can see but what they can't see. In the case of the "antman", mentioned earlier who was preoccupied with ants. He shook his coat out before putting it on to check for ants and always brushed his chair before putting his coat on it, and he wouldn't hang his coat up anywhere in case ants fell on it. Every time he sat down he checked his back for ants, but when asked he was unable to describe an ant even vaguely and unable to distinguish between an ant and a small spider. He believed the ant would eat the coat without any evidence for this belief, and for him the function of ants and spiders and moths were rolled into one, since they were all small insects. In fact the presence of a real ant caused him no problem at all, he was able to approach it, kill it, or ignore it without any fear. Rather it was the black mark on a chair that might be an ant or the thought that ants that he cannot see might be hiding in the plant above his toilet bowl ready to drop on his coat that made him anxious. Similarly a lady with OCD is afraid to touch the handle of a door, or a packet in a shop, because she is afraid it may be dirty and she may be contaminated. It is dirt she cannot see that worries her.

Our hypothesis is that the 'doubt', 'ambivalence' and 'maybe's' that provoke repetitive rituals form part of the confusion the Obsessive-Compulsive experiences when trying to treat imaginary associations as though they were current reality. In other words those people who check and recheck locks, or clean and reclean the floor for hours, and say they do so just in case something may be there, are confusing a remote probability with a completely fictional narrative. Unfortunately in performing the ritual, they are attempting to change an imaginary image by modifying reality, which is akin to attempting to erase a cinema image by wiping clean the cinema screen rather than changing the film in the projector. As a result the person never succeeds in satisfactorily completing the ritual, since it is impossible to do so. But as long as they continue under the impression that they are acting on a real not an imaginary probability, they will not realize that they are attempting the impossible and hence they will persist, stopping finally only through fatigue or for superstitious reasons (e.g. "I've done it 15 times, that must be enough!").

The OCD fictional narrative is generally built up from facts or ideas that have no bearing on the present reality, but nevertheless with which the person feels able to trump information that they do derive from actual reality. For example a female client asked why she believed a table must be dirty, reported that she recalled seeing a similar shaped table some time ago which was dirty and that she had read once in a magazine that tables easily accumulate dust, that further the table was white and reminded her of an old white chair in her parents house that always seemed dirty and off colour. Now in normal inference these past associations might lead one to posit the hypothesis that a table or a floor might be dirty but to nevertheless revise the hypothesis when faced with the sensory evidence that it is not dirty. Yet the OCD client, rather than revising the hypothesis in the face of evidence, revises the evidence in the face of the hypothesis, a kind of inverse way of inferring reality. Interestingly it seems only in the obsessional situation that this inverse inference takes hold on the client. In other non-affected everyday activities the client follows the normal inference rules for deducing reality. For example a client who refuses to trust the evidence presented by his senses to infer that his car door is shut, is quite happy to rely on his senses when driving or walking and correctly infers that he is doing the right thing at the right time in the right place.

The justification for ignoring the evidence of the senses in the obsessional situation is that the dirt or other problem is there but on this occasion cannot be seen, or can be seen only with difficulty, and so might be easily missed. On the surface this seems a plausible argument since microbes and other imperceptible or barely perceptible organisms and particles do exist. But in the OCD case this argument follows not from a genuinely open minded consideration that there might be something there, but from the conviction that something must be there. The rules and procedures that the OCD client follows do not conform to those of a genuine enquiry. Firstly in doing and redoing the ritual to reassure their doubt, the OCD person never takes in any more information; on the contrary they simple rehearse their imaginary doubt. Secondly even if OCD clients did look for evidence, they would not find it since they have no objective criteria to help decide if and when
what they seek has appeared. In addition as we noted above they distrust the very senses which could produce such criteria.

Hence the OCD client is faced with the impossible task of looking for something without knowing when they are certain of finding it. Inevitably this discrepancy creates perpetual doubt. An analogous experimental situation which can produce such 'pathological' doubt is the following: a S is asked to identify whether an object belongs to the experimenter (E) or not. The object is not readily identifiable as belonging to E and the S is given no objective clues for deciding yes or no. After a while the S begins to use his/her imagination to create all sorts of reasons why this or that attribute of the object might indicate it belongs to E. The list is infinite because anything could indicate a link. Hence the S's task is never finished and s/he can return again and again to the object and find more evidence of a link, but without ever being sure, and eventually the S may settle the question wholly with a superstitious reason, e.g. the object is the same colour as E's pullover. In other words the S like the OCD client seeks feedback on the correctness of their decision with reference to irrelevant modalities, since the genuine criteria for decision making are lacking.

In studying the narratives that Obsessive–Compulsives produce to support their beliefs, we have detailed four main errors of inference: inverse inference, inference based on irrelevant memories and associations, dismissal of actual evidence on the grounds of going deeper into reality; and relying on feedback from irrelevant modalities.

**Inverse of normal inference about reality**

At a superficial level most OCD clients know that their ritual serves no purpose and they will happily volunteer its stupidity and nonsensicalness. What they mean by this is that they are 99% or thereabouts sure that their belief is unfounded. However they strongly believe there is a 1% probability that something might be there or might be wrong. It is this 1% belief which is the cause of the OCD clients problem, since the tendency of the OCD client and often the cognitive therapist alike is to not challenge this belief but accept the related event as a real but remote one whose probability the OCD client exaggerates (van Oppen & Arntz, 1994). Indeed if the probability was genuinely real even if remote, there would be some logic for the compulsive behavior. If for example one accepts the premise that it is even remotely possible that a floor has been marched on by muddy boots and that everyone who has walked through is muddy and that a large number of people walk through every 5 min, then it makes some sense to avoid picking something off the floor without washing one’s hands. But this conviction is a fictional hypothesis not a plausible probability, and this confusion highlights a key error in obsessional–compulsive thinking namely inverse inference in the definition of reality. In normal inference one would begin from the observation of mud and muddy boot prints on the floor and work backwards to the hypothesis that a great number of muddy people had marched through. But the OCD client starts with the verity of the hypothesis and concludes that the floor must therefore be muddy.

**Going beyond present reality to a deeper reality**

The OCD client is convinced that they are justified in their belief in spite of no visible evidence since s/he is going beyond surface reality into a deeper layer of reality and frequently the claim is backed up with pseudo scientific claims such as, “if I had a microscope or magnifying glass the dirt would be self-evident”. But if these statements are analyzed, one rapidly discovers that the justifications and associations are fictional. The person who was obsessional about ants, made no attempt to investigate the reality of these beliefs. He claimed to be able to devine invisible insects but had no idea how they would appear even if he did look at them under a microscope, and anyway he had made no previous attempt to 'scientifically' establish the insects even using a magnifying glass. As this client noted, even if a magnifying glass showed nothing this would not convince him that nothing was there. Another client noted that there would be no need for him to look for marks on his letters, as it was a waste of time, since he knew by his intelligence that they were there. In fact, the compulsive ritual and reality testing are antagonistic to each other. The more the person performs the ritual the more they remove their senses from reality and the more they reinforce their imaginary narrative. The rituals have the result of distancing the person from
the present situation, since as long as the person performs the ritual they do not gain any more information on reality and simply rehearse their doubt.

Relying on feedback from a non-pertinent modality

Another aspect of inferential confusion of the OCD client is seeking feedback from sources irrelevant to the actual task in hand. So one of our clients knows by the sound his clothes hanger makes that his clothes are correctly arranged. Another client knows his door is closed because of the amount of effort he has expended in closing it. Counting to a certain number or relying on completion of a pattern are common means to know if a task is completed.

Irrelevant associations

From the OCD clients fictional narrative we can highlight a number of illogical associations which in combination seem peculiar to OCD, such as the inability to distinguish relevant from irrelevant associations, the linking of incidental to genuine connections and an inability to distinguish distinct classes of events. There is an idiosyncratic generalization from one event or memory to a series of unassociated current events. Independent past events are frequently cobbled together because they represent an idiosyncratic theme and incidental isolated factors can be fused together. A client remembers that he once saw an ant in the upstairs bathroom, and on the same day he also saw a plant in the downstairs bathroom. Hence the fuzzy joining of associations made him convinced that the ant would scale the plant and drop on his back when he used the toilet.

We have developed a treatment program based around modifying inferential processes. The aim of the treatment is to help the person realize that what they considered a real but remote probability is a fiction and to reorient the person towards using normal inference in deciding what is reality.

OUTLINE OF TREATMENT SESSIONS

1st Step. Discover elements of the imaginary narrative which generate the obsessional doubt. The narrative is usually composed of irrelevant associations, past memories, hearsay, pseudo-scientific facts, and second-hand experiences. The person will generally need probing to come out with the narrative, since for them the fact that something is dirty, contaminated, unsafe, or whatever, is self-evident. One probe technique to bring out the narrative is to ask exactly what they understand by “good”, “well done”, “dirty”, etc. and to ask what “evidence” they rely on to know if something is “dirty”. Exploring these terms frequently reveals the incoherence implicit in the subjective criteria used and hence the underlying subjective rationale guiding the bizarre associations.

2nd Step. Show that whatever the merits of the narrative, it is not evidence in the actual here and now. This step is difficult and involves exposing the person’s inferential confusion in a series of two mini-steps. The first ministep is to establish with the person that their conclusion that “dirt” or “contamination” exists is not based on observation in the normal way. The person may argue that although the “problem” cannot be seen, s/he knows something is wrong, since: (1) their intelligence/experience tells them; (2) the “problem” is invisible like a microbe and cannot be detected in the normal way; (3) they have to repeat actions “just to be sure” since after all everyone makes mistakes. Initially, this justification is not confronted but the person asked only to agree that for whatever reason they are not basing their judgement on their senses in the normal way. In other words they are not acting as they do in 90% of their life (e.g. shopping, driving, crossing the road). In the second ministep, the basis of their “evidence” for a problem is examined in detail. As mentioned above the “evidence” in general comes from several sources: hearsay, past associations, reasoning “inherited” from non-relevant situations. In discussing the evidence it is important to emphasize that none of this reasoning can justifiably be applied to the present case existing in the here and now. At this point the person usually agrees that it’s 99% certain there is no problem in the present case but there is always that 1% probability of doubt that motivates them to check, wash, etc.

3rd Step. Now in the 3rd Step the therapist highlights the difference between a genuine probability and a hypothesis. This argument can be helped by taking the example of a remote
possibility like a meteor landing in the field next door which even if it happened we could all see by using our senses. On the contrary, something that is not there cannot be a reality, it can only be a postulated reality or hypothesis. The person with OCD acts as if a hypothesis was a reality. But it cannot be anything more than one hypothesis amongst many hypotheses related to the future and the future is not determined.

4th Step. In this step, the fact that the hypothesis is an imaginary hypothesis is highlighted by asking the person to imagine and recount other “narratives” in the same detail as the first narrative, e.g. A client has a narrative that he cannot touch his letters because the postman sorting the mail has not cleaned his hands, and he believes the postman habitually drags his sack on the ground, that he handles dirty circulars and other dirty envelopes before delivering the clients mail. An alternative scenario he imagined was that the postman regularly cleans his hands, the envelopes are sorted through clean machines, and the postman handles the mail carefully and doesn’t drag his sack through mud. Rehearsal of the alternative narrative usually weakens at least a little the person’s conviction that there is a problem, so allowing the person to see the potential power of their narrative in determining their belief.

5th Step. This step concentrates on the way that the person inverses normal inference processes by beginning with the imaginary hypothesis and ending up with reality. Metaphors are very helpful to illustrate this bit of applied philosophy. The “inverse inference” process is highlighted by the example of a detective who decides there is a murder on the basis of what he infers has happened, even though no body is available. Or the case of someone concluding that there must be a bear outside the door and reacting as though there were, even though no evidence is present. The person may counter the “inverse inference” notion with “facts” that invisible microbes exist and that one needs a microscope to see them. These pseudo-scientific assertions can themselves be countered by: (1) showing that the person is not afraid of all microbes (e.g. they are happy to breathe them in); (2) the person has never verified if they can see things through a magnifying glass; (3) however valid, scientific facts may be in other past instances, there is no evidence that they apply to this particular present case in the here and now; (4) even if the person had all the scientific evidence in front of them, they would still doubt it; and (5) as we saw in the previous step of rehearsing alternative-narratives, a change in imaginary story is more powerful at changing their ideas of contamination than knowledge of scientific facts.

6th Step. At this point we discuss the client’s OCD problem in terms of what we have discovered so far and propose that their doubt or conflict as to whether something is done is generated by their imposition of an imaginary story on reality and their attempt to resolve an imaginary problem by manipulating reality. A useful metaphor here is the futility of attempting to clean a cinema screen to get rid of a projected image. Because the criteria for correctness are completely imaginary, they can never be realized, hence the person ends up in a conflict, wanting to do an impossible task and being unable to do it. The perpetual trial creates the vicious loop of repetitive ritual and omnipresent doubt. The more the ritual is performed the greater the doubt, since there is less contact with and information gained from reality, and it is the imaginary story not reality which is rehearsed. In the absence of a real criterion for deciding to finish, the person resorts to fatigue, superstition, or judging by amount of effort expended as to when to stop the ritual.

7th Step. The client is encouraged by self-statements, alternative narratives, and reality-testing to substitute fixed imaginary criteria by real objective criteria. Before implementing reality testing and exposure, agreed objective criteria are set up for deciding when a job is finished or when the hands are clean. These criteria are objective and observable and are stripped of irrelevant and superstitious feedback parameters. The usual behavioral exposure procedures are practiced with response prevention aided by the above cognitive exercises proposed in Step 7.

Rachman (1994) has noted that beliefs about some feared catastrophes tend to be difficult to confirm because of the time scale involved. In other words the rituals aim to prevent future not current events. Although it is not possible to verify the future, it is possible to clarify the difference between acting on the basis of present information and acting as if what is anticipated had already happened. Speculations about the future are any way best concocted on the basis of what has actually happened in the past rather than on imaginative ‘maybe’s’ i.e. thoughts of events that ‘maybe’ possible but which have no basis in experience. In our experience with 6 single cases, the first 7 steps take between 1–3 months, followed by exposure and practice for a further 2–3 months.
CASE EXAMPLES

Case example 1

Mr. F. suffered from OCD for 9 yr. His symptoms consisted of mental and behavioral verifications of journeys he had made in his car, in order to reassure himself that he hadn't hit anyone. Apart from his principal obsession he also had other fears of being contaminated and of suffering from cancer. At the beginning of treatment Mr. F. would spend several hours on his verification ritual and sometimes as long as 7 hr. The ritual also had secondary economic and social consequences and had led to Mr. F. selling his car and destroying his driving licence. The client had previously received Prozac for 1 1/2 yr and a course in behavior therapy which had diminished some minor rituals and led to an approximate 20% decrease in the intensity of his condition. As a first step towards reducing his obsession we explored the narrative at the base of his obsession. On the first occasion that the fear had developed, the client reported that he had heard a noise under his car which had convinced him that something had occurred and subsequently he had heard a report on the radio that someone had been killed in the vicinity where he was driving. The noise had become associated with the possibility of an accident and he had developed the belief that he could kill people without being conscious of the fact. In the next stage the identification of this narrative as an imaginary, rather than probable narrative, was emphasized. His evidence that he had killed anyone depended on non-relevant feedback from association of a radio message with a noise, not on actual observable criteria. He also believed that if he hit someone in his car, he wouldn't be able to finish his projects in life. This fear could be traced to an associated feeling he had acquired when he was young and felt he wouldn't be allowed to finish his projects because something would interrupt. We traced with the client how such past feelings and associations created a conviction about something happening in the here and now.

We pointed out the incoherence in the patient's thoughts whereby on the one hand the patient believed he could kill someone without knowing it, but on the other hand, in all other aspects of his life, his perceptual system functioned well across a range of activities. We proposed concrete alternative hypotheses that he could apply to his doubting narrative. In home practice, the patient modified his thought that 'perhaps' I've hit someone without being aware of it, with the counter proposition that this doubt is imaginary and not relevant to reality, and so the alternative that perhaps he hadn't hit anyone was equally valid. At the end of 4 months of treatment, Mr. F. was able to drive freely in his car without fear of hitting anyone, and was 90% free of compulsions to check, and was able to confront and rid himself of the idea when it occurred.

Case example 2

Mrs B. suffered from chronic OCD of 25 yr standing. Her symptoms consisted of inability to touch any object or person without washing her hands afterwards. Even passing near an object she considered "dirty" or contaminated by other people's touch created the need for her to wash. As a consequence she washed her hands over 50 times per day. She was incapable of physical contact with anyone and was mostly housebound, since if she ventured out and felt the need to wash her hands, she would feel forced to rush home, holding her hands apart from her in order to wash thoroughly. She hence found the symptoms socially and occupationally debilitating and claimed they had cost her two marriages. Her symptoms had persisted despite bilateral pre-frontal lobotomy in 1972, long-term treatment with a range of medication including Prozac and Anafranil, and behavior therapy. Behavior therapy (E + RP) had increased her anxiety and she had discontinued this treatment. In analyzing her conception of dirt we discovered several 'incoherences' in her belief system. She defined "dirt" very selectively and subjectively, for example, she didn't consider mud, or excrement as "dirt". Dirt for her was defined solely by association with certain types of human touch. By looking further at these associations we discovered a narrative which sustained her logic for the touching. In the case of her most high risk situation, touching the bar in a bus or metro, she imagined a series of unsavoury characters touching the bar before her. Her images were based on stories she had read, dirty people she had met (in totally different circumstances) in the past, and ideas that the way certain people appeared to her meant they must have done certain things before entering the bus/metro. She was able to recount in vivid detail what she imagined a certain person on the bus/metro had done before touching the bar, which if true
would certainly have discouraged anyone from touching it. Modifying aspects of this narrative with her, weakened her conviction. Over the next 4 months we examined how her irrelevant associations between dirt and people had arisen, and highlighted confusions she was making between independent characteristics, we clarified how her repetition of her narrative was preventing her from finding out more about what was really present. She learned to challenge ‘inverse inferences’ which were not based on evidence in the here and now, replacing them by genuine reality testing and genuine criteria of dirt. She gradually replaced her old narrative with more realistic and multidimensional narratives of what people may have been doing before she meets them, or what may have happened to objects before touches them. Eight months later she is 90% symptom-free and is able to lead a normal life.

**DISCUSSION**

In this paper, we have proposed that OCD clients exhibit a particular style of inference which involves inferring the plausibility of events on the basis of irrelevant associations, and confusing a fictional narrative with a rare but real probability. We have found with a limited series of case studies that modifying this style of inference reduces OCD symptoms significantly in those who had not previously benefited from CBT.

The key three-way confusion in the obsessional’s mode of inference is between what might be there (a genuine remote probability), what is actually there (a certainty), and what is purely imaginary (and hence a fictitious entity). These inferential confusions seem, in our clinical experience, peculiar to obsessional beliefs, and are not to be found in the 12 commonly observed cognitive distortions mentioned for example by Freeman, Pretzer, Fleming and Simon (1990), or the maladaptive cognitive content or cognitive processes of emotional disorders noted by Beck (1976). Depression and social phobia frequently accompany obsessional problems either as secondary problems or as an independent phenomena, and consequently one may well find the presence of other types of cognitive distortions supplementary to the inferential confusions. But as noted earlier, attempts to define the client’s obsessional problem in terms of a bias or an exaggeration or an overgeneralization of a fear, miss the point that the fear is not generated by objectively defined criterion, i.e. actual dirt, or actual microbes, but rather by a subjectively defined concept of dirt or contamination.

As we mentioned earlier, the OCD client is often 99% convinced that the compulsions are unnecessary, but 1% uncertain. Hence it is not a case of convincing them that the belief is a remote possibility, but rather to convince them that it is not even a probability since even a rare event can occur and when a rare event does occur, it can be identified by objective criteria. In contrast, for the obsessional, the hypothesis, i.e. the imaginary, is the reality before it has occurred and this is the inverse of normal inference where the reality (even if rare) modifies the hypothesis. It is important then to unravel the imaginary narrative of incorrectly associated events of the past which convinces the person they are a probability in the present.

The clinical observations on inference processes noted here tally with previous reports of information processing problems in OCD. The idiosyncratic nature of the clients fictional narrative might explain the subjective nature of the criteria for ‘dirtiness’ or ‘contamination’. The incoherence of such criteria has been noted previously by Rachman and Hodgson (1980). These authors remarked on entering the houses of OCD people that some parts were spotless, others chaotic and dirty, but that this did not seem to worry the clients. Enright and Beech (1993) have noted obsessionals have difficulty suppressing irrelevant information which could explain the facility with which irrelevant associations become fused. However these processing deficits tend to be viewed as hard wired problems, whereas in our clinical observations we have found inferential deficits only in certain situations with inference functioning normally in most of the clients everyday life. Furthermore such inference processes can be modified. According to the inferential model, the key symptom of pathological doubt and intolerance of uncertainty would follow from illogical inference, rather than be stand alone symptoms. If the person is attempting to treat imagination as reality and looking for imaginary criteria in the here and now, they will forever be uncertain.
Obviously the current hypothesis about inference processes playing a peculiar role in OCD, needs to be verified on a more diverse clinical grouping. In addition comparisons of the inference processes of OCD clients with the inference processes of normal Ss need to be explored.

REFERENCES


