INFORMATION TO USERS

This reproduction was made from a copy of a document sent to us for microfilming. While the most advanced technology has been used to photograph and reproduce this document, the quality of the reproduction is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help clarify markings or notations which may appear on this reproduction.

1. The sign or “target” for pages apparently lacking from the document photographed is “Missing Page(s)”. If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure complete continuity.

2. When an image on the film is obliterated with a round black mark, it is an indication of either blurred copy because of movement during exposure, duplicate copy, or copyrighted materials that should not have been filmed. For blurred pages, a good image of the page can be found in the adjacent frame. If copyrighted materials were deleted, a target note will appear listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed, a definite method of “sectioning” the material has been followed. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For illustrations that cannot be satisfactorily reproduced by xerographic means, photographic prints can be purchased at additional cost and inserted into your xerographic copy. These prints are available upon request from the Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases the best available copy has been filmed.
Welkowitz, Lawrence Andrew

BEHAVIOR THERAPY FOR OBSESSIVE-COMPULSIVE DISORDER: AN ALTERNATIVE FRAMEWORK

University of Hawaii

University Microfilms International 300 N. Zeeb Road, Ann Arbor, MI 48106

PH.D. 1985
PLEASE NOTE:

In all cases this material has been filmed in the best possible way from the available copy. Problems encountered with this document have been identified here with a check mark ✅.

1. Glossy photographs or pages
2. Colored illustrations, paper or print
3. Photographs with dark background
4. Illustrations are poor copy
5. Pages with black marks, not original copy
6. Print shows through as there is text on both sides of page
7. Indistinct, broken or small print on several pages
8. Print exceeds margin requirements
9. Tightly bound copy with print lost in spine
10. Computer printout pages with indistinct print
11. Page(s) lacking when material received, and not available from school or author.
12. Page(s) seem to be missing in numbering only as text follows.
13. Two pages numbered. Text follows.
14. Curling and wrinkled pages
15. Dissertation contains pages with print at a slant, filmed as received
16. Other

University Microfilms International
BEHAVIOR THERAPY FOR OBSESSIVE-COMPULSIVE DISORDER:

AN ALTERNATIVE FRAMEWORK

A DISSERTATION SUBMITTED TO THE GRADUATE DIVISION OF THE UNIVERSITY OF HAWAII IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN PSYCHOLOGY

AUGUST 1985

By

LAWRENCE ANDREW WELKOWITZ

Dissertation Committee:

Gilfred Tanabe, Chairman
Elaine Heiby
Thomas Ciborowski
Richard Dubanoski
Alex Pickens
ACKNOWLEDGEMENTS

I would like to express my appreciation to Lowell Anderson, Associate Professor of Psychiatry at NYU Medical Center/Bellevue Hospital, for his suggestions and guidance throughout the course of this project. I would also like to thank Florence Diamond, Clinic Administrator at Millhauser Laboratories, NYU Medical Center, for her assistance in handling clinic details for the Obsessive-Compulsive Research Program.
ABSTRACT

The purpose of this study was to examine the contribution of social/living skills to outcome in exposure and response prevention therapy for a group of obsessive-compulsive patients. A model is presented which emphasizes the role of social/living skills and the ability to develop alternative behaviors for improving in this type of therapy. Twenty patients were treated with ten sessions of exposure and response prevention therapy. These participants also completed a battery of social/living skills and obsessive-compulsive measures at three time periods: 1) pre-test, 2) post-test, and 3) two-week follow-up. The results indicated that 1) patients as a group improved as a result of exposure and response prevention, and 2) moderate support was found for the notion that social/living skills are a factor in outcome. A revised model is presented which suggests that exposure and response prevention produces differential effects, depending on whether or not the patient's ritual behaviors are anxiety based. Specifically, patients whose rituals produce relief from anxiety appear to benefit most from exposure and response prevention, compared to those patients whose rituals do not result in anxiety relief. It is suggested that those patients who do not benefit from this therapy require a more extensive functional analysis of the problem.
# TABLE OF CONTENTS

ACKNOWLEDGEMENTS................................................................. iii

ABSTRACT................................................................................. iv

LIST OF TABLES......................................................................... vii

LIST OF FIGURES....................................................................... viii

LIST OF ABBREVIATIONS........................................................... ix

CHAPTER I. INTRODUCTION........................................................... 1

Theories of Etiology................................................................. 5

Family and Social Factors....................................................... 16

Biological Theories of Etiology............................................... 18

Treatment Studies................................................................. 22

Behavioral Treatment............................................................ 23

Alternative Behavioral Treatments........................................... 30

Linear Versus Non-Linear Analysis.......................................... 33

Developing a New Model: The Present Study......................... 36

Summary of Specific Hypotheses.............................................. 39

CHAPTER II. METHODS................................................................. 43

Subjects................................................................................... 43

Instruments.............................................................................. 44

Procedure................................................................................. 47

Data Analysis............................................................................ 48

CHAPTER III. RESULTS................................................................. 51

Descriptive Data...................................................................... 51
Hypothesis I Findings...............................55
Hypothesis II Findings.............................57
Hypothesis III Findings............................72
Hypothesis IV Findings.............................74

CHAPTER IV. DISCUSSION.............................79
Therapist Consistency...............................79
Effects of Treatment...............................80
The Independent Measures..........................82
Social Skills and Outcome...........................83
Patient Fact Sheet Items.............................88
Use of Daily Log Data...............................90
Social/Living Skills Measures.......................91
Dependent Measures.................................94
Anxiety Relief.......................................96
Other Fact Sheet Findings/Family Factors.........97
Methodological Considerations.....................98
Clinical Observations...............................100
Conclusion..........................................102

REFERENCES.........................................105

APPENDIX............................................121
<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>MMPI (Pt) Psychasthenia Scale Scores</td>
</tr>
<tr>
<td>2</td>
<td>Features of O-C Patients Derived from Items on the Patient Fact Sheet</td>
</tr>
<tr>
<td>3</td>
<td>Repeated Measures ANOVA for MOCI Across Three Time Periods</td>
</tr>
<tr>
<td>4</td>
<td>Repeated Measures ANOVA for LOI-Symptom Across Three Time Periods</td>
</tr>
<tr>
<td>5</td>
<td>Repeated Measures ANOVA for LOI-Trait Across Three Time Periods</td>
</tr>
<tr>
<td>6</td>
<td>Repeated Measures ANOVA for GRAI-Discomfort Across Three Time Periods</td>
</tr>
<tr>
<td>7</td>
<td>Repeated Measures ANOVA for SPSS-Total Across Three Time Periods</td>
</tr>
<tr>
<td>8</td>
<td>Correlations Between Dependent Measures and Daily Logs</td>
</tr>
<tr>
<td>9</td>
<td>Correlations Among the Independent Measures</td>
</tr>
<tr>
<td>10</td>
<td>Correlations Among the Dependent Measures</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>An Alternative Model</td>
<td>38</td>
</tr>
<tr>
<td>2</td>
<td>MOCI Score Means for the Three Testing Periods</td>
<td>59</td>
</tr>
<tr>
<td>3</td>
<td>LOI-Symptom Means for the Three Testing Periods</td>
<td>61</td>
</tr>
<tr>
<td>4</td>
<td>LOI-Trait Means for the Three Testing Periods</td>
<td>63</td>
</tr>
<tr>
<td>5</td>
<td>GRAI-Discomfort Means for the Three Testing Periods</td>
<td>65</td>
</tr>
<tr>
<td>6</td>
<td>SPSS-Total Score Means for the Three Testing Periods</td>
<td>67</td>
</tr>
</tbody>
</table>
# LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GRAI</td>
<td>Gambrill-Richey Assertive Inventory</td>
</tr>
<tr>
<td>SPSS</td>
<td>Social Performance Survey Schedule</td>
</tr>
<tr>
<td>ABSS</td>
<td>Assertive Behavior Survey Schedule</td>
</tr>
<tr>
<td>FPLEAS</td>
<td>Frequency of Pleasant Events Schedule</td>
</tr>
<tr>
<td>FUNPLEAS</td>
<td>Frequency of Unpleasant Events</td>
</tr>
<tr>
<td>SASS</td>
<td>Social Anxiety Survey Schedule</td>
</tr>
<tr>
<td>MOCI</td>
<td>Maudsley Obsessional Inventory</td>
</tr>
<tr>
<td>LOI</td>
<td>Leyton Obsessional Inventory</td>
</tr>
<tr>
<td>MMPI</td>
<td>Minnesota Multiphasic Personality Inventory</td>
</tr>
<tr>
<td>MRA</td>
<td>Multiple Regression Analysis</td>
</tr>
<tr>
<td>ANOVA</td>
<td>Analysis of Variance</td>
</tr>
<tr>
<td>S/L Skills</td>
<td>Social/Living Skills</td>
</tr>
<tr>
<td>O-C</td>
<td>Obsessive-Compulsive</td>
</tr>
<tr>
<td>Sr2</td>
<td>Squared Semi-Partial Correlation</td>
</tr>
</tbody>
</table>
INTRODUCTION

Obsessive-compulsive disorder is an extremely rare condition which has long puzzled psychological investigators. There is widespread agreement that this disorder is more resistant to treatment than most other types of psychiatric illnesses (Ananth, 1983) and that its symptoms often plague its sufferers for a lifetime (Pollitt, 1969). While incidence statistics have varied, it has been estimated to occur in about .05% of the general population (Woodruff & Pitts, 1964) and less than 3% of psychiatric populations (Black, 1974). Despite its rarity, similar cases of the disorder have been reported throughout the world, including India (Akhtar, Wig, Verma, Pershod, & Verma, 1975), China (Lo, 1967), Germany (Zaworka & Hand, 1980), England (Marks, Stein, Mawson, Cobb, & McDonald, 1980), Canada (Roy, 1979), Japan (Inouye, 1965), and the United States (Foa, Steketee, & Milby, 1980).

This disorder, also known as obsessive-compulsive neurosis or illness, may be defined by its two major components, obsessions and compulsions. According to DSM III (1980), obsessions are recurrent, persistent ideas or thoughts which invade consciousness in such a manner that they are experienced as being senseless (i.e., ego-dystonic). Compulsions may be
viewed as the behavioral concomitants of obsessions. These are repetitive behaviors that are performed in accordance with certain rules or in a stereotyped fashion. Typical compulsive symptoms include cleaning and checking rituals which in some cases may consume most of an individual's waking hours (e.g., Emmelkamp, 1982, p. 294). As with obsessions, the compulsions are typically recognized as senseless activities which have come to interfere with the individual's daily functioning.

Numerous case reports and other studies in the literature have detailed the unusual activities of individuals with obsessive-compulsive disorder. Patients with cleaning compulsions typically report fear of contamination and insist on going to great lengths to avoid a variety of contaminants. When such individuals touch anything that might be perceived as contaminated, such as window sills, certain foods, table tops, money, and other people, they will wash themselves thoroughly for minutes or hours at a time. In many cases, the hands of these "washers" will be raw and irritated from over washing. In one case a compulsive with washing rituals would insist on taking showers which lasted as long as 24 hours and consequently developed visible skin problems (study cited in Marks, 1981). In a case reported by Rachman & Hodgson (1980, p. 65), a compulsive was reported to wash her hands 200 times per day during a baseline assessment period. Checking rituals have been found to be equally as extensive. For example, individuals with
such compulsions may repeatedly check if doors are locked, ovens are turned off, or if accidents have occurred on roads which they have traveled (Emmelkamp, 1982).

The recognition and identification of these repetitive thoughts and behaviors have not been relegated to psychological and psychiatric investigators alone. In his treatise, "Of Religious Melancholy" (1692) the Bishop John Moore described obsessional problems among his parishioners as "...Naughty and sometimes blasphemous thoughts which start in the mind while they are exercised in the worship of God despite all their endeavors to stifle and suppress them." Moore also observed that "the more they struggle with them, the more they increase." Author Jeremy A. Taylor, writing in the 17th century, referred to obsessions as "scruples" when he wrote that "...Scruple is a little stone in the foot, if you set it upon the ground it hurts you; if you hold it up you cannot go forward; it is trouble where the trouble is over, a doubt when doubts are resolved...very often it hath no reason at all for its inducement." (Taylor, 1660).

In the modern history of psychology, Kraepelin offered the earliest descriptions of obsessional neurosis which he called Zwangsneurose. It was Freud, however, who published the classical clinical description of the disorder:

"The obsessional neurosis takes this form:

The patient's mind is occupied with thoughts
that do not really interest him, he feels impulses which seem alien to him, and he is impelled to perform actions which not only afford him no pleasure but from which he is powerless to desist. The thoughts (obsessions) may be meaningless in themselves or only of no interest to the patient; they are often only absolutely silly ..." (Freud, 1955).

Unlike Freud, most modern day investigators prefer to distinguish obsessions and compulsions for research purposes. While this is done on the basis of their mode of expression (Carr, 1974; Ullmann & Krasner, 1975), both obsessions and compulsions are typically viewed as maladaptive devices for reducing anxiety (Nemiah, 1975; Steketee, Foa, & Grayson, 1982). According to Emmelkamp (1982, p. 7), approximately 80% of obsessive-compulsives have obsessions as well as compulsions. Thus, ritual behavior (e.g., hand washing, checking, object arrangement) unaccompanied by obsessions (e.g., counting to oneself, doubting) is relatively rare. Obsessive-compulsive behavior is reported to be rare among children (Rapoport, Elkins, Langer, Sceery, Buchsbaum, Gillin, Murphy, Zahn, Lake, Ludlow, & Mendelson, 1982) and age of onset is in the early 20's (Black, 1974).
Theories of Etiology

A variety of etiological theories regarding obsessive-compulsive disorder have been discussed in the literature. These include psychoanalytic (Freud, 1909; Fenichel, 1977), biological (Groves & Thompson, 1970), cognitive (Beech & Liddell, 1974), learning (Teasdale, 1974), and evolutionary (Holland, 1974) based approaches. While Leitenberg (1976) has largely dismissed such writings, arguing that they fail in helping to construct appropriate interventions, a discussion of these theories is useful in helping to understand the evolution of treatment practices.

In examining Freud's contributions to the psychoanalytic view of obsessive-compulsive disorder, a distinction must be made between obsessive-compulsive personality and obsessive-compulsive disorder. As defined earlier, an individual with obsessive-compulsive disorder actively suffers from obsessions and compulsions which are manifested in ritualistic behaviors. The individual with obsessive-compulsive personality is not a ritualizer, but is instead a normal functioning person with obsessive-type traits such as orderliness and obstinacy (Freud, 1908). According to Freud, the development of obsessive-compulsive disorders are linked, in part, to the development of an exceptionally severe super-ego. This results from excessive libidinal demands of the oedipus complex and the subsequent regression of the libido to the anal
phase. In response to this "unkind" super-ego, the ego produces strong reaction formations in the form of typical obsessive-compulsive symptomatology (Freud, 1926). In his interpretation of the Freudian position on obsessive-compulsive neurosis, Nagera (1976) has noted the importance of a variety of defense mechanisms, including undoing, displacement, reaction formation, and isolation of content and affect. The obsessive-compulsive symptoms (i.e., rituals) are thus explained as compromises between instinctual drives and defenses against them (Nagera, 1976; Freud, 1926). Beech (1974) has noted that Freud’s views of obsessive-compulsive disorder were not limited to early psychological trauma but were instead also concerned with influences that Freud was unable to specify. In Freud’s words, the causes of obsessive-compulsive disorder were divided between "those which the individual brings with him into life, and those which life brings to him" (Collected Papers, Vol. 2, Chap. 11 as cited by Beech, 1974). On the difficulty of identifying these causes more precisely, Freud confessed: "Obsessional neurosis is unquestionably the most interesting and repaying subject of analytic research. But as a problem it has not yet been mastered" (Freud, 1926, p. 113).

The learning theories to be discussed have often been cited as relevant to the etiology of phobias as well as obsessive-compulsive disorder (Teasdale, 1974; Emmelkamp, 1982). This is related to the frequently observed presence of an
avoidance factor in obsessive-compulsive disorder. Emmelkamp (1982) thus describes a case in which an obsessive-compulsive patient who exhibited cleaning rituals would refuse to leave her home for fear of contamination by outside objects. If any objects were brought into the house, she would consequently wash them as well as her hands for a long period of time. According to Emmelkamp (1982) this case serves to illustrate a passive avoidance (i.e., the patient avoids exposure to elements which might set off ritualistic behavior) as well as active avoidance (exemplified by the cleaning and washing rituals).

The two-factor theory of avoidance learning presented by Mowrer (1960) may be considered relevant to the development and maintenance of obsessive-compulsive symptoms. This theory combines classical and operant principles which are exemplified in a classic shuttle box training procedure (e.g., Mowrer & Lamoreaux, 1942): A rat placed in a box with an electrifiable floor is presented with repeated pairings of a "warning signal" (e.g., a light) and shock. The light will acquire aversive properties (via classical conditioning) such that its presentation will evoke a conditioned anxiety reaction. By engaging in an avoidance response, the rat terminates the light (warning signal or Sd) thereby reducing the anxiety it would experience. This reduction in anxiety is negatively reinforcing and thereby acts to increase the probability of an avoidance response (operant conditioning). In terms of
obsessive-compulsive symptomatology, a patient with washing rituals gets dirt on his hands which provokes a conditioned anxiety response. This anxiety is reduced when the patient engages in the ritual (washing his hands) which therefore acts to increase the probability that the ritual will be utilized in the future for this purpose.

The application of the two-factor theory to obsessive-compulsive disorder may be criticized on the basis of experimental evidence with humans. Several investigators (Herrnstein, 1969; Bolles, 1970) have argued that avoidance behavior in shuttle-box procedures need not be explained as the result of removing sources of conditioned anxiety. These researchers have presented evidence that avoidance behaviors which result in a reduction in the number of shocks which would "otherwise be received" can be acquired and maintained in this manner (see Teasdale, 1974). Secondly, the classical conditioning component of Mowrer's theory would suggest that the occurrence of a traumatic event should precede the exhibition of obsessive-compulsive behaviors. While several investigators have reported an excess of precipitating life events in the development of obsessive-compulsive disorder (Pollit, 1957; Ingram, 1961; Lo, 1967; Bridges, Goktepe, & Maratos, 1973; McKeon, Roa, & Mann, 1984) as well as general problems in life stress (Horowitz, 1975), there are few reports of onset of the disorder being related to traumatic events (see Wolpe, 1958). A
related criticism based on clinical observations (Emmelkamp, 1982) is that a number of obsessive-compulsive patients exhibit a variety of types of obsessions and ritualistic behaviors at the same time and still others report that the types of symptoms change across time. The important point here is that both of these clinical pictures often exist in the absence of precipitating traumatic learning events.

Much of the research regarding etiology and treatment of obsessive-compulsive disorder has utilized the notion of anxiety reduction which supposedly results from ritualistic behaviors. The anxiety reduction model of obsessive-compulsive disorder has often been referred to as the "behavioral theory" (Cobb, 1983; Thyer, Curtis, & Fechner, 1984), presumably because it predicts increased occurrence of ritualistic behaviors as a result of the reinforcing effects of decreases in anxiety. As will be discussed later in this paper, the appropriateness of the behavioral label here may be misleading; several investigators, for example, have argued that a more precise and rigorous use of the functional analysis would preclude the label "behavioral" assigned to the anxiety reduction position (Queiroz, Motta, Madi, Sossai, and Boren, 1981; Sidman, 1960; Hersen & Barlow, 1976). Emmelkamp (1982) and Nagera (1976) have pointed out that the psychoanalytic position as well as this behavioral position assume that ritualistic behaviors have anxiety reducing effects.

There is, however, conflicting evidence regarding the
anxiety reducing effects of ritualistic behaviors. Walker and Beech (1969), for example, have shown that in some cases anxiety may actually increase during performance of rituals. Furthermore, Rachman (1976) has hypothesized that checkers and washers may differ in their patterns of anxiety while engaging in ritual behaviors. Finally, Herrnstein (1969) has argued that anxiety relief experienced during ritual behaviors is not the critical reinforcer. Instead, he maintains that it is the avoidance of greater anxiety that would be produced by unobserved alternative behaviors which is maintaining the rituals. This formulation is similar to that of Goldiamond's alternative sets and linear versus non-linear analysis (1984) which will be discussed at length later in this paper.

A study by Ayllon, Haughton, and Hughes (1965) implicates the role of positive reinforcement in the development of obsessive-compulsive behaviors. In a single subject study, they produced a compulsive-like symptom which they called "compulsive broom carrying" in an otherwise non-compulsive psychotic inpatient. This was accomplished by making access to cigarettes contingent upon exhibiting the target compulsive symptom. Carr (1974) has argued that classifying such a coerced behavior as compulsive is inappropriate because it neglects the subjective experience of the individual. It may also be argued that topographical versus functional distinctions (Schwartz & Goldiamond, 1975; Queiroz, et al., 1981) must be included in any
discussion of etiology of a disorder. In the Ayllon, et al. (1965) study, the functional purpose of the "compulsive-like" symptom (i.e., access to cigarettes) may differ from that of an obsessive-compulsive's symptoms.

A cognitive-behavioral model for explaining obsessive-compulsive neurosis has been presented by McFall & Wollersheim (1979). This model is based on the stress and coping models of Lazarus (1966) as well as the rational-emotive theories and therapies of Ellis (1962; 1977) and reflects a recent popular movement in behavior therapy to consider the influence of mediational organismic variables on emotion and behavior (e.g., Meichenbaum, 1977; Mahoney, 1974). According to McFall, et al. (1979) the obsessive-compulsive's ritualistic behavior is linked to deficits in what Lazarus (1966) has called primary and secondary appraisal. Primary appraisal refers to the process whereby an individual estimates the danger of a threatening event in relation to what is perceived to be one's resources to cope with such a threat. After this initial process is completed, the individual exhibits particular affective and behavioral responses based on a secondary appraisal of the expected consequences of personal coping efforts. According to McFall, et al (1979), the obsessive-compulsive's primary appraisal abilities are plagued by several irrational beliefs which have been acquired in an unspecified manner. These irrational or unreasonable notions include the following
(McFall, et al., 1979, p. 335): (1) one should be perfectly competent, adequate, and achieving in all possible respects in order to be worthwhile and to avoid criticism or disapproval by others/oneself; (2) making mistakes or failing to live up to one’s perfectionistic ideals should result in punishment or condemnation; (3) one is powerful enough to initiate or prevent the occurrence of disastrous outcomes by magical rituals or obsessive ruminating; and (4) certain thoughts and feelings are unacceptable, having them could lead to catastrophe (e.g., anger will result in homicide), and one should be punished for having them. Following this distorted process of primary appraisal (linked to one or more of these irrational beliefs), the obsessive-compulsive then proceeds to a secondary appraisal process which is once again influenced by a set of irrational beliefs, including (1) if something is or may be dangerous, one should be terribly upset by it; (2) magical rituals or obsessive ruminating will circumvent feared outcomes; (3) it is easier and more effective to carry out a magical ritual or to obsess than it is to confront one’s feelings/thoughts directly; and (4) feelings of uncertainty and loss of control are intolerable, should make one afraid, and something must be done about them. According to the authors, these appraisal processes may occur at a "preconscious level" and obsessive-compulsive individuals may therefore not be aware of these so-called causes of their illness. Such a position, of course, makes scientific inquiry
more difficult since methods for exploring preconscious events are not delineated. Furthermore, advocates of such cognitive oriented models have failed to explain the ways in which such irrational beliefs have been developed. As will be discussed later, the treatment techniques for obsessive-compulsive disorder recommended by this theoretical stance are relatively untested at this time.

Other cognitive oriented theorists (Reed, 1976; Beech & Liddell, 1974) have emphasized the importance of deficits in decision-making processes in the development and maintenance of obsessive-compulsive behaviors. Reed (1968; 1976) has thus argued that distress experienced among his patients was linked to problems in categorizing, terminating, organizing and structuring a variety of experiences. While Reed's patients reported that they could successfully engage in deductive reasoning processes, they were nevertheless fraught with doubts about the conclusions they had produced. These doubtful thoughts, Reed pointed out, could often be related to trivial issues, such as whether to ride one's bicycle at a high or low rate of speed (Reed, 1968). In a later article, Reed (1976) hypothesized that obsessive-compulsive rituals are the results of "forlorn attempts" to impose exaggerated structure on various experiences. The obsessive-compulsive thus exhibits an inability to categorize or temporally order these experiences. In sum, while the obsessive-compulsive is said to "know" on an
intellectual level when to stop engaging in ritual behavior, they are unable to "internalize" this knowledge. Thus, in the absence of any sense of completion or conviction of one's knowledge, the obsessive-compulsive does not implement the intellectual decision (Reed, 1976).

Several studies on tolerance of ambiguity and rigidity among obsessive-compulsives suggest a link between cognitive style and the disorder (Volans, 1976; Millner, Beech, & Walker, 1971; Hamilton, 1957). A variety of tests have been developed to assess tolerance of ambiguity (Fransella, 1974), a typical example being the presentation of a series of ambiguous drawings which gradually depict a particular figure, such as a dog. The experimenter is able to determine how many pictures the subject needed to view (i.e., the extent of clarity required) before a decision could be reached. The findings of studies in which obsessive-compulsives complete such tasks tend to support the thesis that these individuals avoid ambiguity to a greater degree than do normal individuals (Fransella, 1974). An example of such a study is that of Milner, et al. (1971) in which six obsessive-compulsive patients and eight controls (non-obessional patients and 8 controls (non-obessional psychiatric patients) were given a simple signal detection test. Subjects were asked to respond "yes or no" as to whether or not an auditory stimulus was present and the subject was permitted to request repeats of each trial presentation. The results indicated that the
obsessive-compulsive subjects requested a significantly greater number of "repeats" than did control subjects, thus supporting the notion that the obsessive-compulsive requires an abnormally great amount of information in making decisions. While Walker (1967) has also collected evidence in support of a tolerance of ambiguity deficit among obsessionals, he has noted that not all decisions by these individuals are marked by such "hesitancy and postponement." Walker has thus asserted that additional hypotheses are needed to explain these other situations.

Both Walker (1973) and Rachman (1977) have argued that the "source" of obsessive rituals is traceable to a fundamental obsessional idea, fear, or belief. These authors have distinguished two types of obsessional thoughts on the basis of what they consider to be important phenomenological differences. The first type is an obsessional idea such as an unrealistic fear of harming oneself or others. The second type is a thought which acts to neutralize the obsession by means which are typically perceived as magical or superstitious. An example of such a neutralizing ritualistic thought is a repetitive chant or prayer which presumably acts to "undo" the effects of an obsession. Rachman (1976) has further argued that the origins of obsessive-compulsive behaviors may be linked in an ingrained "fear of criticism." While a number of researchers have provided evidence contrary to such a position (Thyer, Curtis, & Fechner, 1984; Turner, Steketee, & Foa, 1979), Rachman (1976)
has used the fear of criticism notion to argue that checking rituals are motivated by guilt while washing rituals are motivated primarily by fear. He has also discussed the ways in which parental factors influence the development of these neurotic attributes.

Family and Social Factors. Interestingly, very little information has been collected regarding family and other social developmental factors in obsessive-compulsive disorder. While noting this observation in their recent review, Rachman and Hodgson (1980) have nevertheless suggested that parents who are themselves obsessive-compulsive, pass on a general neurotic predisposition via social means. Thus, they argue that many obsessive-compulsive parents tend to generally shape a broad range of maladaptive, rather than obsessive-compulsive behaviors.

Hoover and Insel (1984) collected family data on 174 relatives of ten severely obsessive-compulsive patients: While none of the relatives reported meeting DSM-III criteria for obsessive-compulsive disorder, nearly twelve percent of first degree relatives had been hospitalized for other psychiatric illnesses. In all cases, these families exhibited an unusually strong emphasis on perfection and cleanliness, even though they themselves did not report engaging in compulsive rituals. One case report from the Hoover, et al. (1984) study reflects the fine distinction between having obsessive-compulsive disorder on the one hand, and exhibiting compulsive-like traits on the other.
"The father of one obsessive-compulsive young man (family 1) was upset by finding some dirt in the bathroom of the motel where he was staying, that he was unable to sleep in the bed provided, or even remain in the motel; since no alternative accommodations were available, he spent much of that night anxiously walking the town streets...He thought of himself as particular about cleanliness, but this seemed quite reasonable and natural to him, certainly not a feeling to be resisted. (Hoover & Insel, 1984, p. 209).

Thus, the relatives differed from the obsessive-compulsive patients in that their obsessive-compulsive habits were ego-syntonic. That is, their "symptoms" were experienced as normal responses which they felt did not require any resistance on their part. This is in contradiction to the presentation of a typical obsessive-compulsive whose symptoms are largely ego-dystonic (DSM-III, 1980). Other data collected in the Hoover, et al. (1984) study indicated that families of the patients tended to be socially isolated, that parental marriages were "unfulfilled," that parents maintained high expectations of devotion and attention from their children, and that grandparents also tended to be domineering and had high expectations of grandchildren. Another striking finding was the intensity and extensiveness of family involvement of family
members in the rituals of the obsessive-compulsive patient. In one case, Hoover, et al. (1984) reported that a father had driven 20 miles to get the particular brand of soap that the patient felt he needed when engaging in his ritualistic washing. In other cases reported in the study, several mothers would cleanse themselves in ritual manners before washing laundry in response to the demands of their obsessive-compulsive children. Interestingly, these parents acknowledged that they were making grave errors in their handling of these and other demands, but felt powerless to do otherwise (Hoover, et al., 1984).

In addition to the contribution of genetic vulnerability, Rachman (1976) has asserted that different types of parental concern and control will result in different types of compulsive behaviors among offspring. Specifically, Rachman has hypothesized that checking rituals will more often occur in families in which parents are excessively critical and tend to set unusually high standards for their children. Parents who are excessively protective of their children will have a greater probability of producing compulsive washing and cleaning symptomatology in their offspring. Rachman (1976) has also postulated that parents who themselves engage in compulsive cleaning rituals are more likely to produce obsessive-compulsive children compared to parents who engage in checking rituals.

**Biological theories of etiology.** Beech and Liddell (1974) have hypothesized that physiological arousal, in the form
of a variety of mood states, plays a critical role in the formation of obsessive-compulsive behavior. They have argued that obsessive-compulsives suffer from an elevated level of arousal (and concomitant mood swings) which result in decision making difficulties. Conversely, these researchers argued that decision making difficulties may cause increased arousal levels which are indicated by problems in anxiety and depression. While supporting evidence for a pathological arousal theory of obsessive-compulsive disorder has been limited to a few GSR responsivity studies (Beech & Perigault, 1974; Rabavilas, Boulougouris, Stefanis, & Vaidakis, 1977), such a theory has implicated the importance of other disorders, such as depression, in the etiology of obsessive-compulsive disorder. The moderate effectiveness of certain anti-depressants in the treatment of obsessive-compulsive disorder has bolstered the notion of an affective illness link to obsessive-compulsive disorder (Mavissakalian & Michelson, 1983; Mawson, Marks, & Ramm, 1982). In addition, there is evidence that the sleep patterns of patients with obsessive-compulsive disorder are similar to those with affective disorders (Insel, Gillin, Moore, mendelson, Loewenstein, & Murphy, 1982). Specifically, the Insel, et al. (1982) study showed that both obsessive-compulsive sufferers and depressives exhibited abnormally low sleep time with more awakenings, less stage 4 sleep, decreased rapid-eye-movement (REM) and shortened REM latency as compared
to a matched group of normal subjects.

Information regarding the genetic contribution to obsessive-compulsive disorder is limited and fraught with methodological and experimental problems typical in this area of research (Farber, 1982). Calculations by Black (1974), for example, suggest that discovering even one pair of identical twins concordant for obsessive-compulsive disorder would be improbable, thus excluding the possibility of empirically valid twins/genetic studies. Nevertheless, Marks and his colleagues (Marks, Crowe, Drewe, Young, & Dewhurst, 1969) reported on a pair of identical twins, both of whom exhibited marked obsessive-compulsive symptoms by the age of 10 years. While Black (1974) has commented that the symptoms of the Marks, et al. (1969) twins were probably strengthened by a social interaction effect, it is interesting to note that severity did not change after the twins were separated.

Family data on incidence of obsessive-compulsive disorder, in addition to the twins data, fail to confirm or deny a genetic component in the genesis of obsessive-compulsive behavior. In a recent study by Insel, Hoover, & Murphy (1983), family histories obtained from 27 obsessive-compulsive patients did not reveal a single parent with the disorder. However, three parents in this study did exhibit scores in the obsessional range on the Leyton Obsessional Inventory. Thus, while patients deny or fail to report obsessive-compulsive problems among their parents, this
does not necessarily exclude the possibility that parents and
other relatives may have obsessive-compulsive types of problems.
In contrast to the Insel, et al. (1983) study, Brown (1942)
provided data to show that, compared with controls, the parents
of obsessive-compulsive patients had a significantly higher
incidence of the disorder (8 percent). As with twin studies,
these family studies can not firmly establish a genetic position
for the etiology of obsessive-compulsive disorder. Emmelkamp
(1982) has thus argued that these limited data could just as
easily be construed as support for an environmental contribution.

The search for a link between obsessive-compulsive disorder
and brain pathology may be linked to a variety of sources,
including findings of increased incidence of
obsessive-compulsive rituals in patients with Gilles de la
Tourettes syndrome (Nee, Caine, Polinsky, et al., 1980), an
association of obsessive-compulsive disorder with the
encephalitis epidemic of the 1920's (Meyer-Gross, & Steiner,
1921), the finding of a greater number of abnormal birth events
among obsessive-compulsives compared to control subjects
(Capstick & Seldrup, 1977), as well as a link between marijuana
ingestion and temporary exhibition of compulsive symptoms
(Morley, Logie, & Bensusan, 1973). While these leads indicate
that future research in brain-behavior relationships in
obsessive-compulsive disorder is warranted, the evidence for
such a relationship is weak at the present time. Studies by
Behar and his colleagues at NIMH (Behar, Rapoport, Berg, Denckla, Mann, Cox, Fedio, Zahn, & Wolfman, 1984) with obsessive-compulsive adolescents revealed abnormally high mean ventricular-brain ratio compared to matched normal controls on CAT scan test (Computerized tomography). In neuropsychological testing, the obsessive-compulsive subjects exhibited spatial-perceptual deficits similar to those found among individuals with frontal lobe lesions. While the finding of abnormal EEG recordings among obsessive-compulsives by Flor-Henry, Yeudall, Koles, & Howarth (1979) may be viewed as moderately supportive of the NIMH group's findings, a number of researchers have been unable to replicate these findings (Rapoport, Elkins, Langer, Sceery, Buchsbaum, Gillin, Murphy, Zahn, Lake, Ludlow, & Mendelson, 1982; Greenberg, 1981). The dearth of compelling data in this area is reflected in the conclusions offered by Templer (1972): "Although obsessive-compulsive manifestations are frequently seen in organic patients, the evidence for brain pathology in the majority of typical obsessive-compulsive neurotics is quite slim."

**Treatment Studies**

In his review of treatment approaches for neurotic disorders, Leitenberg (1976) concluded that traditional therapies have failed to relieve obsessive-compulsive symptoms: "...It is particularly disabling and resistant to conventional
treatment (insight-oriented psychotherapy, extensive
psychoanalysis, chemotherapy, ECT, and even as a last extreme,
leucotomy, have all been of little avail)” (p. 155). A
comprehensive follow-up study of obsessive-compulsive sufferers
done by Kringlen (1965) revealed that of 90 patients treated by
psychotherapy, only 19 showed improvement as determined by
therapists’ ratings. As Meyer, Levy, and Schnurer (1974) have
pointed out, such results could be even poorer if more precise
assessment procedures were utilized. It is only in the past 10
to 15 years that significant inroads in the treatment of
obsessive-compulsive disorder have been accomplished, largely
due to the development of new behavioral oriented approaches
(Marks, Rachman, & Hodgson, 1975; Foa, Steketee, & Milby, 1981).

Behavioral treatment. In recent years, researchers
have achieved considerable success in the treatment of
obsessive-compulsive disorder by applying a treatment approach
known as “exposure and response prevention therapy” (Leitenberg,
1976; Marks, 1981). This treatment is based on the
anxiety-reduction model discussed earlier which assumes that
compulsive rituals are negatively reinforced by their anxiety
relieving effects. Exposure and response prevention is thus a
two-pronged process which is carried out as follows: 1) the
patient is exposed to the situations (or thoughts) which
normally evoke ritualistic behaviors (e.g., the compulsive hand
washer is exposed to dirt) and 2) the patient is prevented from
engaging in the ritual behavior (e.g., the compulsive washer is not allowed to wash his/her hands). The anxiety elicited by the exposure portion of the treatment will eventually dissipate in the absence of the ritual, thus enabling the patient to experience anxiety reduction without engaging in a maladaptive behavior. Thus, an extinction process is presumed to occur which is intended to reduce the frequency of ritualistic behaviors. In contrast to the lack of success achieved by traditional therapeutic approaches, investigators employing exposure and response prevention have reported an average success rate of approximately 70% (Emmelkamp & Kraanen, 1977; Marks, Hodgson, & Rachman, 1975; Boulougouris & Bassiakas, 1973; Foa & Goldstein, 1978; Steketee, Foa, & Grayson, 1981).

In an early uncontrolled study by Levy and Meyer (1971) a group of eight obsessive-compulsive sufferers were given continuous 24 hours per day exposure and response prevention which lasted anywhere from one to four weeks. Hospital staff were instructed to continually instruct these patients to 1) expose themselves to stimuli which made them feel compelled to engage in rituals and 2) block any ritual behavior. While the response blocking was usually carried out by means of instructions by nurses, it was necessary, at times, to physically restrain some patients from carrying out compulsive acts. While interpretation of the results must be tempered by the fact that no control group was employed and that subjective
ratings by patient and therapist served as outcome measures, the finding that six of the eight patients were regarded as "much improved" may be considered impressive. The fact that these patients had previously received other treatments, such as anti-depressants, tranquilizers, ECT, leucotomy, psychotherapy, and psychoanalysis, to no avail, has strengthened the meaningfulness of these results (Leitenberg, 1976).

Marks (1981) has analyzed four early pilot studies completed at Maudsley Hospital in England in the early 1970's (Rachman, Marks, & Hodgson, 1971; Rachman, Marks, & Hodgson, 1973; Rachman & Marks, 1972; Marks, Rachman, & Hodgson, 1975). From these combined studies, 20 obsessive-compulsive patients were treated with several separate approaches in a crossover design. These approaches included rapid exposure (i.e., patients were exposed to difficult items at the beginning of treatment) and response prevention, slow exposure and response prevention, and relaxation. While the analyses of these data are weakened by the absence of blind raters and true random assignment to conditions, the results nevertheless tend to support the efficacy of in vivo exposure compared to relaxation therapy: no immediate reduction in compulsive rituals was attained by the 15 patients who received 3 weeks of relaxation treatment. However, 14 of the 20 patients were reported to have responded "very well," 1 moderately well," and 5 "only slightly or not at all" to the total treatment plan, with 6 patients
achieving a ritual-free status. Follow-up examinations at 6 months and 2 years revealed that treatment gains had been maintained and has been used to support Marks’ (1981) contention that in vivo exposure is a critical treatment component for obsessive-compulsive disorder.

Since the discovery of the effectiveness of exposure and response prevention for the treatment of obsessive-compulsive disorder, researchers have begun to focus their attention on specifying the essential components of the treatment. Recent studies have thus explored such issues as the differential effects of exposure versus response prevention (Steketee, Foa, & Grayson, 1982; Marks, 1981), rapid versus slow exposure (Boersma, Den Hengst, Dekker, and Emmelkamp, 1976), the importance of modeling (Roper, Rachman, & Marks, 1975), 24 hour versus 1 hour exposure periods (Marks, 1981), the importance of treating ancillary problems such as depression (Marks & Ramm, 1982), and the use of imaginary versus in vivo exposure (Steketee, et al., 1982).

In a series of crossover design studies, Steketee, et al. (1982) compared the effectiveness of the exposure and response prevention components of the typically combined therapy package. In one study 8 obsessive-compulsives were assigned either to a group which received exposure followed by a combined exposure and response prevention therapy, or to a group which received response prevention followed by the combined exposure and
response prevention therapy. The treatment in this study was carried out over two treatment periods (two weeks per period) in which each period included 10, two-hour sessions. While all three treatment components (exposure, response prevention, and combined exposure plus response prevention) were effective in reducing time spent ritualizing, the data also indicated the presence of differential effects: While response prevention was more effective than exposure in reducing frequency of ritualizing, the exposure component helped to decrease anxiety (e.g., to sources of contamination) to a greater degree compared to response prevention. Furthermore, gains were enhanced upon completion of the combined exposure and response prevention treatment. The authors concluded that optimal behavioral treatment of obsessive-compulsive disorder should include both of these components as well as imaginal exposure for insuring maintenance of treatment gains (Steketee, et al., 1982).

Another important finding for the clinical treatment of obsessive-compulsive disorder was that one-hour daily exposure/response prevention sessions were equally as effective as continuous 24 hour supervised procedures (Robertson, as cited by Marks, 1981). An 18 month follow-up in this study which included 13 obsessive-compulsive patients revealed that all but two had maintained treatment gains. Kirk (1982) has thus demonstrated that exposure and response prevention therapy can readily be accomplished in a routine clinical practice by replacing
much of the in vivo practice with homework assignments. In this manner, the obsessive-compulsive patient can be directed to work on the exposure and response prevention without the costly supervision of a health care professional.

A study by Boersma, Den Hengst, Dekker, & Emmelkamp, 1976) compared the effects of rapid versus slow exposure. Thirteen severe obsessive-compulsives received 15 sessions of either a "flooding" or a "gradual exposure" program. In the flooding group, only the most anxiety producing activities or situations were employed as practice items. Members of the gradual exposure group began instead with the least difficult situations and gradually worked up the hierarchy to more difficult items. The results indicated that rapid and gradual exposure are equally effective in treating obsessive-compulsive symptoms. While these findings are interesting because they are similar to those found in treatment studies of phobias (e.g., Emmelkamp, 1974) and therefore may have certain theoretical implications, the clinical implications are less clear. For example, Emmelkamp (1982) has warned that flooding may be more difficult for a patient to carry out because it tends to elicit overly high levels of anxiety. Gradual exposure may therefore be the preferred treatment mode since it will probably be more acceptable to the patient.

The moderate success of several drug treatment approaches to obsessive-compulsive disorder (Tesar & Jenike, 1984; Jenike,
Surman, Cassem, Zusky, & Anderson, 1983) has lead several investigators to explore the effectiveness of combined behavior therapy plus drug packages (Rachman, Cobb, Grey, McDonald, Mawson, Marks, & Ramm, 1982). While the evidence regarding the effectiveness of anti-anxiety drugs (Tesar, et al., 1984) and tricyclic antidepressants (Mawson, et al., 1982) is conflicting, psychiatric investigators continue to search for a treatment approach which addresses both biological and behavioral issues.

A study by Mawson, et al. (1982) compared the effects of clomipramine (anti-depressant) and in vivo exposure with placebo and exposure, and included a two year follow-up. The results indicated that subjects in both groups exhibited significant reduction in obsessive-compulsive behaviors. Subjects in the Clomipramine group showed a greater initial response to treatment but by the time two years had elapsed, there was no evidence of a drug effect. Finally, greater severity of depressive or anxiety-type difficulties was predictive of greater initial response to clomipramine compared to placebo. This finding is in concert with the findings of Mavissakalian and Michelson (1983) who found that tricyclic anti-depressants do not have a specific effect on obsessive-compulsive symptoms which is independent of their anti-depressant effect. In addition, Marks and his colleagues (Marks, ttern, Mawson, Cobb, & McDonald, 1980) have reported positive effects of clomipramine primarily among patients with high pre-treatment depression.
scores. The tentative conclusion of these studies may be that anti-depressants or anti-anxiety drugs may be useful as adjunctive treatment only for patients who have problems in depression or anxiety which are secondary to obsessive-compulsive disorder (Marks, 1981).

**Alternative behavioral treatments**

Surprisingly, few studies have examined alternatives to the exposure and response prevention therapy. This may be linked to the popularity of the anxiety reduction model of obsessive-compulsive disorder discussed earlier which recommends the use of exposure and related procedures. While the improvement rate with this type of approach is impressive, some patients remain unresponsive to treatment. In these cases, it may be hypothesized that other factors or variables are maintaining obsessive-compulsive behaviors. Wolpe (1958) and Emmelkamp (1982) have, for example, suggested that assertiveness training may, in some cases, be the treatment of choice for obsessive-compulsive disorder. This suggestion is based on the observation that obsessive-compulsives often tend to be socially isolated and to lack skills needed for developing social relationships (Hoover & Insel, 1984). A careful functional analysis of a patient's behavior may therefore suggest that either these skills deficits or the dearth of alternative activities may be helping to maintain obsessive-compulsive behaviors.
In one of the few studies in the literature which has explored the possibility of "other" maintaining variables, Queiroz, Motta, Madi, Sossai, and Boren (1981) reported on three case studies in which the functional analysis was the primary tool for understanding and treating obsessive-compulsive behaviors. These authors delineated a number of important principles for the development of alternative treatment plans. The importance of analyzing each case on an individual basis in order to "ferret out" idiosyncratic, but critical, variables was emphasized. In addition, Queiroz, et al. (1981) cited the need for making topographical versus functional distinctions (i.e., the use of exposure/response prevention therapy or drugs may be viewed as an approach which relies solely on the topographical identification of obsessive-compulsive symptoms). In addition, the formulation of alternative behaviors to obsessive-compulsive actions was considered an integral component of therapy. Thus, in the case of a middle-aged married family man who complained of several distressing obsessive thoughts, mostly related to god and religion, a variety of alternative behaviors were constructed. These included helping other people at home to augment the possibility of positive reinforcement, getting a job, going shopping, and making accurate descriptions of religious objects and people on the street. The therapy, in this case, was augmented by using the wife as a mediator (Tharp & Wetzel, 1969) for reinforcing target behaviors, as well as assertiveness
training, and systematic desensitization for fears related to religious objects. While data concerning frequency and duration of obsessive-compulsive behaviors were not available for this case, a "significant reduction" in symptoms was reported.

Haley (1984) has reported on the successful treatment of a compulsive handwasher by means of "ordeal marital therapy." Using a strategic marital format, the therapist, in this case, prescribed a difficult task or "ordeal" which was discerned to be incompatible with the wife's handwashing rituals. The therapy also focused on the social/attentional gains the wife derived by engaging in obsessive-compulsive symptoms (i.e., she would request and receive assurances from her husband and children that she had washed her hands) In a more sophisticated study in which the role of marital problems in obsessive-compulsive disorder was examined, Cobb, McDonald, Marks, and Stern (1980) compared behavioral marital therapy and exposure with response prevention in a crossover design. The results failed to support the notion that marital therapy is useful for relieving obsessive-compulsive symptoms: The marital therapy, which consisted of communication and sexual skills training and reciprocity counseling was reported to be useful only in solving marital problems, while the exposure treatment phase was found to be effective in reducing the frequency of ritualistic behaviors. It should be pointed out that with the small sample of obsessive-compulsives in this study (n=4) it is conceivable
that while marital problems may not have been maintaining variables for obsessive-compulsive symptoms in these cases, there may be other cases in which the solution of marital problems may help in solving compulsive problems.

In noting that obsessive-compulsive behaviors, for certain patients, may help to allow these individuals to avoid social contacts, Emmelkamp (1982) treated a socially anxious and unassertive obsessive-compulsive with assertiveness training. The patient was a 32 year old single female and social isolate whose contamination-related rituals were initially treated by the standard exposure and response prevention therapy. Because this treatment approach was largely unsuccessful, a decision was made to move to the alternative treatment, assertiveness training. While Emmelkamp (1982) reported that this second phase of treatment was successful in reducing the patient's urge to engage in rituals, the uncontrolled nature of the study makes it difficult to identify precisely the effective treatment component. It may be, for example, that the assertiveness training merely served as a catalyst for more effective exposure and response prevention to take place. At this time, there have been no large scale, sophisticated studies, examining the importance of social and assertiveness skills in the treatment of obsessive-compulsive disorder.

**Linear Versus Non-linear Analysis**

The alternative behavioral approaches to treatment
discussed above may be described as "indirect" since the interventions derived from them are not focused directly on the ritualistic behavior. This is in contrast to the exposure and response prevention procedures which may be viewed as "direct" assaults on the problem behavior. The notion of direct versus indirect behavioral analysis which has been explored by Queiroz, et al. (1981) in their treatment report on obsessive-compulsive disorder is similar to Goldiamond's (1984) recent formulation of linear and non-linear analysis. Goldiamond distinguishes cases in which a problem behavior is considered to be a function of variables within its exclusive domain, such as the reinforcement history of the behavior (linear), and cases in which domains of alternative behaviors must be considered (non-linear). The implications of such a broadened view of the functional analysis have been noted by Goldiamond (1984, p. 506):

"A theoretical implication is that when a unilinear operant analysis, say, of the RB (referent behavior) does not provide adequate explanation of the RB, the answer is not necessarily to reject operant analysis in such cases in favor of, say, a cognitive analysis (cf. Skinner, 1980, pp. 89-90). One might first try a non-linear operant analysis, in which neither the RB nor the AB's (alternative behaviors) can be explained by sole reference to the operant unilinearity of either, but in reference to the combined contingencies the operants represent" (Goldiamond, 1975).
As Queiroz et al. (1981) have noted, there are cases in which a direct or unilinear approach is highly effective. Thus, procedures such as exposure with response prevention (Rachman, Hodgson, & Marks, 1971) are often effective in treating obsessions and compulsions. For other cases, such as those for which exposure with response prevention has failed to solve obsessive-compulsive problems, interventions must be placed elsewhere. A careful analysis of maintaining variables may reveal that the disturbing behaviors are linked to problems in a variety of areas, including deficits in assertiveness and social skills (Emmelkamp, 1982), family involvement with symptoms (Hoover & Insel, 1984), social isolation (Hoover, et al., 1984) and marital discord (Cobb, 1983), to name but a few. It follows then, that treatment procedures should sometimes be direct (i.e., when maintaining variables are in the domain of the disturbing behavior), while at other times the treatment must be indirect (e.g., when the disturbing behavior is maintained by deficits in personal living skills). The important point of both Queiroz, et al. (1981) and Goldiamond (1984) is not the rejection of a direct approach to treatment, but rather the application of the functional analysis for understanding both simple and complex factors in obsessive-compulsive disorder in particular, and maladaptive behaviors in general.
Developing a New Model: The Present Study

The apparent success of exposure with response prevention therapy (Marks, 1981) has bolstered the argument that obsessive-compulsive behavior is maintained by means of negative reinforcement (i.e., by the anxiety-relieving effects of ritual behaviors). However, when failures in this type of behavioral treatment are considered, it becomes necessary to examine what "other" factors are operating to support obsessive-compulsive responses. In a recent analysis of failures in the treatment of obsessive-compulsive disorder, Foa and her colleagues (Foa, Steketee, Grayson, & Doppelt, 1979) discussed the possible involvement of several factors, including failure in emotional processing (e.g., excessive arousal in response to feared stimuli which is said to interfere with habituation and needed cognitive changes), overvalued ideation (i.e., when patients maintain that their fears are realistic) and level of depression (i.e., that non-depressed patients respond better to treatment than those who are highly depressed).

Another possibility, based on the writings of Goldiamond (1984) on linear vs. non-linear analysis, and Queiroz, et al. (1981) on application of the functional analysis to obsessive-compulsive problems, is the importance of the patient having the ability to develop alternative behaviors to the obsessive-compulsive behaviors. A failure in exposure with response prevention may therefore be linked to the inability to
develop alternative behaviors, rather than a failure to habituate during an extinction procedure or to develop appropriate changes in distorted thinking. A general schematic which reflects the importance of developing alternative behaviors in the treatment of obsessive-compulsive disorder is illustrated in Figure 1.

Thus, in some cases, merely getting the patient to stop engaging in rituals for a period of time allows the individual to come into contact with reinforcing events in the natural environment (e.g., Tharp & Wetzel, 1969). In this case, exposure with response prevention is all that is needed. In other cases, the obsessive-compulsive sufferer may lack the skills needed to reap the benefits that the environment has to offer. In such a case, alternative behaviors have to be developed, presumably by means of living/social skills training and other instructional methods (Fodor, 1980).

Recent advances in behavioral assessment have made it possible to measure the abilities of individuals to develop and engage in a variety of alternative activities. These include self-report devices which are currently being utilized in both clinical and research settings. They include measures of social skills and performance such as the Social Performance Survey Schedule (Lowe & Cautela, 1978) and the Social Anxiety Survey Schedule (Cautela, 1977); measures of assertive behavior such as
Figure 1
An Alternative Model

Response Prevention
(Instructions to stop ritual behavior)

Patient comes into contact with natural reinforcers (i.e., Patient able to develop Alternative behaviors)

Compulsive behaviors diminish

Patient unable to reap benefits of natural environment (i.e., Patient unable to develop Alternative behaviors)

Patient relapses into baseline levels
the Assertiveness Inventory (Gambrill & Richey, 1975) and the Assertive Behavior Survey Schedule (Cautela & Upper, 1976); and the measurement of frequency of pleasant events (MacPhillamy & Lewinsohn, 1971). These assessment devices are being utilized in the present study and will therefore be discussed in the methodology section of this report. Information on reliability and validity will be presented in Appendix 1.

In light of recent evidence and suggestions that training certain obsessive-compulsives in different types of personal skills helps to reduce severity of the disorder, an important next step in this line of research is the systematic exploration of the link between personal living skills and outcome in treatment. The main hypothesis of this study is that level of social and living skills is a critical variable in predicting the success or failure of the obsessive compulsive in responding to exposure and response prevention treatment. Specifically, those individuals with low social skills are expected to 1) respond less well to treatment as determined by post-testing upon completion of the therapy period and 2) exhibit a greater degree of relapse at a follow-up assessment period. The results of this study will serve as the catalyst for a discussion of the role of developing alternative behaviors in treating obsessive-compulsive problems.

The goal of this study, then, is to assess the relationship between social/living (SL) skills and outcome of treatment for a
group of obsessive-compulsive adults. This group of patients are chronic sufferers whose symptoms are persistent over time with no marked variability. Unlike other groups of neurotic individuals, treatment studies with obsessive-compulsive patients do not typically contain such components as "wait-list" or "no-treatment" comparisons for the following reasons: 1) obsessive-compulsive symptoms do not dissipate when left untreated (Leitenberg, 1976; Ananth, 1983; Pollitt, 1969), thus eliminating the need to control for spontaneous recovery (which occurs in other neurotic disorders, such as depression) and 2) the low prevalence of obsessive-compulsive disorder does not allow for a sufficiently large untreated group. In fact, group studies on obsessive-compulsive disorder have taken place primarily in large cities such as London (Marks, 1981) and Philadelphia (Foa & Steketee, 1982). In this study, subjects were drawn from in- and out-patient sources at a major hospital (New York University Medical Center) located in New York City. Furthermore, as will be discussed in the Data Analyses section, statistical control for SL skills level was be accomplished by employing SL skills as covariates in the multiple regression analyses. In this manner, individuals with high versus low SL skills were compared in terms of success in therapy.

Summary of specific hypotheses. While a number of other ancillary questions will be addressed in the Results and
Discussion sections of this paper, the following is a summary of the primary hypotheses:

I. Subjects as a group will show improvement as a result of exposure and response prevention therapy. This hypothesis has been confirmed by numerous other treatment studies discussed previously and will be reassessed here.

II. Social and assertiveness skills significantly contribute to outcome in exposure and response prevention therapy. A variety of independent and dependent measures will be employed in testing this hypothesis.

III. An exploratory question of this study concerns the validation of daily log data (self-monitoring of frequency and duration of ritual behaviors). It is expected that daily log data will be significantly correlated with other more established obsessive-compulsive outcome measures. This question has never before been addressed and should serve as an important contribution in assessment and measurement of obsessive-compulsive behaviors.

In addition to the specific hypothesis listed above, the collection of these data offers the opportunity to validate the independent and dependent measures used in this study. For example, the relationship between the Social Performance Survey Schedule and the Gambril Richey Assertiveness Inventory will be examined.

IV. Global ratings by patient and therapist will be
compared with no specific hypothesis presented. Studies of obsessive-compulsive disorder have relied on such global ratings for gauging success in treatment. It is expected that they should be significantly correlated with other outcome measures.

V. It is expected that patients will report that they experience anxiety relief through the performance of rituals. This is not in contradiction to hypothesis II, since such a finding would not establish tension reduction as a critical variable affecting ritual frequency.
CHAPTER II
METHODS

Subjects
Subjects were 20 adults (11 females, 9 males) diagnosed as having obsessive-compulsive disorder. The ages of subjects ranged from 17 to 78. Candidates for this study were recruited by means of posters displayed in several teaching hospitals in New York City.

Criteria for selection followed the recommendations of Emmelkamp (e.g., Boersma, Den Hengst, Dekker, & Emmelkamp, 1976) and Foa (e.g., Steketee, Foa, & Grayson, 1982). The DSM-III criteria are summarized as follows: A) The patient exhibits either recurrent, persistent ideas or thoughts which invade consciousness and are experienced as senseless, or repetitive behaviors that are performed in a stereotyped fashion. B) The obsessions and compulsions are a significant source of distress to the individual or interfere with social functioning. C) The obsessive compulsive behaviors are not due to another mental disorder, such as Tourette’s Syndrome, schizophrenia, major depression, or other organic mental disorder (DSM-III, 1980).

The symptoms must be ego-dystonic (viewed as senseless) and the subject must exhibit at least a moderate elevation (t>50) on the MMPI Psychasthenia Scale (see Table 1 for subjects’ MMPI
scores). Finally, the subject must have agreed to participate in the treatment program and have signed a consent form (see Appendix 2).

**Instruments**

The social/living skills measures (independent measures) included the Assertiveness Inventory (Gambrill & Richey, 1975), the Social Performance Survey Schedule (Lowe & Cautela, 1978), the Social Anxiety Survey Schedule (Cautela, 1977), the Assertive Behavior Survey Schedule (Cautela & Upper, 1976), and the Pleasant and Unpleasant Events Schedule (MacPhillamy & Lewinsohn, 1971). The outcome measures (dependent measures) were the Leyton Obsessional Inventory (Cooper, 1970) and the Maudsley Obsessional-Compulsive Inventory (Hodgson & Rachman, 1977). Reliability and validity information are provided in Appendix 1).

The Assertive Inventory (AI) (Gambrill & Richey, 1975) is a 40 item measure which allows subjects to rate a variety of social situations on both degree of discomfort as well as the probability that they would engage in such a behavior. The measure thus provides two scale scores (Discomfort and Probability).

The Social Performance Survey Schedule (SPSS) (Lowe & Cautela, 1978) contains 100 descriptions of social behaviors with frequencies rated on a 5 point scale. One-half of the items are positive behaviors while the other half are negative
behaviors. Thus, 3 scale scores may be obtained (Positive Behavior score, Negative Behavior score, and a total score).

The Social Anxiety Survey Schedule (SASS) (Cautela, 1977) permits the respondent to rate how much anxiety is experienced in 34 situations. The categories range from heterosocial events to situations requiring assertive behavior.

Section 1 of the Assertive Behavior Survey Schedule (ABSS) (Cautela & Upper, 1976) asks the respondent to choose one of several responses he or she would most likely exhibit in situations requiring an assertive response. The choices range from a highly assertive option to escape or non-assertive options.

The Pleasant and Unpleasant Events Schedule (MacPhillamy & Lewinsohn, 1971) contains a list of pleasant events and a list of unpleasant events. The subject is asked to rate the frequency with which he or she engaged in these events during the past 30 days. For the purpose of this study, it is presumed that the occurrence of high levels of pleasant events reflects an ability to develop an array of alternative activities.

The Leyton Obsessional Inventory (LOI) (Cooper, 1970) contains 69 yes/no questions regarding obsessive-compulsive behaviors (symptoms) and traits. The measure thus yields two scale scores, Symptom and Trait. This instrument has been recommended as an outcome measure of treatment studies (Cooper, 1970). For the purpose of this study, the Symptom scale score is
most important since reduction in symptoms, rather than traits, is the goal of the treatment.

The Maudsley Obsessional-Compulsive (MOC) Inventory (Hodgson & Rachman, 1977) is a 30 item true-false test which lists the most commonly reported obsessive-compulsive complaints. This questionnaire controls for acquiescent response set and contains items which differentiate obsessive and non-obsessive neurotics.

Global ratings of improvement (4 point scale) recommended by Kirk (1983) were completed both by therapist and patient. These data were explored as dependent measures. Daily logs of frequency and duration of ritual behaviors were maintained by patients for the purpose of validation. Since there are no studies which have validated the use of daily log data as dependent measures, this exploration should serve as an important contribution in the area of assessment. Finally, six single scale items taken from the Patient Fact Sheet (see Appendix 2) were included as independent variables. These include 4 point ratings by patient regarding such issues as anxiety relief from performing rituals (#9), frequency of rituals (#11), extent of interference in daily functioning (#13), secondary gain (#18), social skills (#20), and program expectations (#25).

A reliability checklist (see Appendix 2) was utilized for the purpose of rating audiotapes of therapy sessions. An
independent rater evaluated 10% of all therapy sessions as to whether or not the therapist engaged in the following behaviors: 1) reviewed homework assignment from previous session 2) reviewed the patient's daily logs 3) discussed "exposure and response prevention" therapy, and 4) designed homework tasks for the coming week. Accuracy findings are presented in the Results section.

**Procedure**

All subjects received ten hours of exposure and response prevention therapy as outlined by Emmelkamp (1982). This treatment program involves regular administration of homework tasks as well as in-session in-vivo practice. During the first session a hierarchy of ritual behaviors is constructed on a continuum ranging from least anxiety producing items to most anxiety producing items (subjects rate each item on a 10 point anxiety scale). The therapist provides a rationale for employing exposure and response prevention (i.e., ritual behaviors are explained in terms of the tension reduction model discussed earlier), gives task examples, and assigns homework tasks toward the end of each session. The role of the therapist is to guide the patient, in step-like fashion, up through the hierarchy of ritual items. The goal is for the patient to be able to practice exposure and response prevention on the most difficult items by the tenth and final session. Exposure and response prevention is translated to the patient as meaning
putting oneself in a situation in which anxiety increases (i.e., a situation in which the patient feels compelled to engage in a ritual) and then blocking or not allowing oneself to engage in a ritual activity. In order to insure consistent performance on the part of the therapist, sessions were audiotaped and reliability checks were completed on 10% of all sessions.

All subjects were tested at 3 time periods: 1) pre-test (prior to treatment), 2) post-test (at the end of the tenth session), and 3) 2-week follow-up. The major independent and dependent measures were administered at each of the three time periods.

**Data Analysis**

Several types of data analyses were employed, depending on the research question. For the purpose of examining changes in dependent and independent measures across time periods, analysis of variance (ANOVA) was utilized. In the case of significant ANOVAs for a particular measure across time periods, multiple comparisons were accomplished by means of Protected t-tests. This method was selected due to its high power and small number of testing periods (3) (Keppel, 1982).

For the major task of assessing the relationship between social/living skills and outcome of treatment, the data were analyzed by means of univariate hierarchical multiple regression analyses (Cohen & Cohen, 1975). Probability levels were set at the .10 level due to the small sample size. The independent
variables in the analysis were SPSS-Negative behavior, SPSS-Positive behavior, SPSS-Total, SASS, GRAI-Discomfort, GRAI-Probability, ABSS, Pleasant Events, Unpleasant Events. In a separate analysis, single-item scales taken from the Patient Fact Sheet were examined as independent variables as well. These included Anxiety Relief, Frequency of Rituals, Interference in Daily Functioning, Secondary Gain, Social Skills, and Expectations about Program. The categorical variables (gender, period) were dummy coded, while the quantitative independent variables were treated as continuous variables. The dependent measures were the MOCI, the LOI-Symptom and the LOI-trait. in separate analyses, improvement ratings by theapist and by patient were explored as dependent measures. Each of the dependent measures was analyzed separately.

Multiple Regression Analyses (MRA) permits the partitioning of the variation in each dependent variable due to the variation in a series of independent variables. The system can simultaneously handle continuous (e.g., social skills) and categorical data (e.g., gender) and their interactions. Although there is an identity between MRA and ANOVA in so far as all ANOVA problems can be handled by MRA, the converse is not true. The end products of MRA, then, are statements about the unique contribution of each variable, combinations of variables, and interactions, to the prediction of the dependent measures, with squared semi-partialled correlations computed as an independent
measure of proportion of variance accounted for in the dependent measure.

Observations and measurements in this study were made on the same subjects and multiple time intervals. By using MRA techniques, error variance can be reduced by taking into account the fact that subjects have been used repeatedly. This design permits observation of the effects of therapy and/or specific SL skills at different time intervals.

Finally, zero order Pearson correlations were computed for the independent and dependent measures. This was done for the purpose of examining the interrelationships among the various measures (particularly the social skills measures) as well as for validating the use of frequency and duration data taken from the Patient Daily Logs (i.e., self-monitoring data).
CHAPTER III

RESULTS

Descriptive Data

The MMPI Psychasthenia (Pt) scale scores for each subject are presented in Table 1. Ninety percent of the subjects scored in the highly elevated range while 10% scored in the moderately elevated range. As discussed in the Methods section, a score in the moderately elevated range or higher was a condition for acceptance to the study.

The reliability check on therapist's behavior was accomplished by means of an independent rating of therapy audiotapes. An accuracy coefficient was computed by dividing the total number of behaviors accounted for by the total possible number of observed behaviors. This quotient was then converted to a percentage by multiplying that value by 100 (see Cone & Hawkins, 1977). The calculated accuracy coefficient for this study was 95%, indicating that the therapist was consistent across sessions in engaging in appropriate exposure and response prevention related behaviors.

A summary of information about each patient, derived from the Patient Fact Sheet, is presented in Table 2. The presence or absence of relevant features is included for descriptive purposes. Several items which relate to issues raised in the Introduction of this paper include the following: 1) 80% of the
<table>
<thead>
<tr>
<th>Subject #</th>
<th>Pt score* (t value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>94</td>
</tr>
<tr>
<td>2</td>
<td>89</td>
</tr>
<tr>
<td>3</td>
<td>77</td>
</tr>
<tr>
<td>4</td>
<td>94</td>
</tr>
<tr>
<td>5</td>
<td>93</td>
</tr>
<tr>
<td>6</td>
<td>91</td>
</tr>
<tr>
<td>7</td>
<td>95</td>
</tr>
<tr>
<td>8</td>
<td>98</td>
</tr>
<tr>
<td>9</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>98</td>
</tr>
<tr>
<td>11</td>
<td>89</td>
</tr>
<tr>
<td>12</td>
<td>93</td>
</tr>
<tr>
<td>13</td>
<td>70</td>
</tr>
<tr>
<td>14</td>
<td>78</td>
</tr>
<tr>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>16</td>
<td>98</td>
</tr>
<tr>
<td>17</td>
<td>86</td>
</tr>
<tr>
<td>18</td>
<td>67</td>
</tr>
<tr>
<td>19</td>
<td>78</td>
</tr>
<tr>
<td>20</td>
<td>110</td>
</tr>
</tbody>
</table>

* T > 70 high elevation

\[ \bar{X} = 87.40 \]

50 < T < 70 moderate elevation

SD = 12.82
### Table 2

Features of O-C Patient Derived from Items on Patient Fact Sheet

(An X indicates presence of feature)

<table>
<thead>
<tr>
<th>Patient</th>
<th>Anxiety</th>
<th>Family relief</th>
<th>Keep rituals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X X</td>
<td>X</td>
</tr>
<tr>
<td>8</td>
<td>X</td>
<td>X X</td>
<td>X</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>10</td>
<td>X</td>
<td>X X</td>
<td>X</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>15</td>
<td>X</td>
<td>X X</td>
<td>X</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>X X</td>
<td>X</td>
</tr>
<tr>
<td>17</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>X X</td>
<td>X</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% presence for each category

<table>
<thead>
<tr>
<th>Anxiety</th>
<th>Family relief</th>
<th>Keep rituals</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>55</td>
<td>80</td>
</tr>
</tbody>
</table>

(continued)
Table 2 (continued)

Features of O-C Patient Derived from Items on Patient Fact Sheet

(An X indicates presence of feature)

<table>
<thead>
<tr>
<th>Patient</th>
<th>Socially Unskilled</th>
<th>Psychiatric Meds</th>
<th>Involves others in ritual</th>
<th>Traumatic events with onset</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>15</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% presence for each category: 65, 40, 45, 45
subjects reported anxiety relief associated with performance of rituals, 2) 65% rate themselves as socially unskilled, 3) 45% report a traumatic event related to onset, 4) 45% report having grown up in socially isolated families, 5) 35% report that other family members exhibit similar types of obsessive-compulsive symptoms.

**Hypothesis I Findings**

The analysis of variance (ANOVA) on the major dependent variables across testing periods revealed significant changes in terms of outcome. Analysis of the scores on the Maudsley Obsessional-Compulsive Inventory yielded an effect across periods, $F(2,38)=4.60, p<.05$ (see Table 3 for ANOVA table). The Protected- $t$ test revealed a significant difference between scores at Period 1 and Period 3, $t(38)=3.02, p<.01$. In addition, a significant difference was found between Period 2 and period 3 scores, $t(38)=1.73, p<.10$. The mean scores for each period are illustrated in histogram form (see Figure 2) and show a steady decline (i.e., a trend toward lower or less pathological scores) across periods.

The analysis of the Leyton Obsessional Inventory-Symptom (LOI-Symptom) revealed an overall effect across testing periods, $F(2,38)=2.63, p<.10$ (see Table 4 for ANOVA details). The Protected- $t$ yielded a significant effect for the Period 1 versus Period 2 comparison, $t(38)=1.68, p<.10$. The Period 1 versus Period 3 comparison also yielded a significant effect,
The histogram illustration of mean LOI-Symptom scores for each period (Figure 3) indicates a steady decline in scores across testing periods. The analysis of the Leyton Obsessional Inventory-Trait (LOI-Trait) scores also revealed an effect, $F(2,38)=3.48$, $p<.05$. The Protected-$t$ test indicates an effect for the Period 1 versus Period 3 comparison, $t(38)=2.61$, $p<.05$ and the histogram display of mean scores for each period illustrates a steady decline in subjects' LOI-Trait scores during the course of treatment. Thus, patients as a group endorsed fewer pathological responses as they proceeded from pre-test to follow-up.

The ANOVA for the independent measures (i.e., social/living skills measures) across testing periods revealed several effects. Analysis of the Gambril-Richey Assertiveness Inventory-Discomfort scores (GRAI-Discomfort) resulted in $F(2,38)=3.50$, $p<.05$ (see Table 6). The Protected-$t$ test revealed an effect for the Period 1 versus Period 3 comparison, $t(38)=2.61$, $p<.05$. The decline in GRAI-Discomfort scores across testing periods is illustrated in figure 5. The decline in scores indicates that subjects endorsed items consistent with less discomfort associated with assertive behavior at the end of therapy (e.g., at follow-up) compared to item endorsement or ratings at the beginning of treatment. An overall effect for the Social Performance Survey Schedule was also found, $F(2,38)=2.45$, $p<.10$ (see Table 7). The Protected-$t$ test
indicated a significant difference between scores at Period 1 compared to those at Period 2, $t(38)=2.04$, $p<.05$. The histogram display of means (Figure 6) illustrates the trend toward higher ratings of social performance abilities across the treatment testing periods.

**Hypothesis II Findings**

The hierarchical multiple regression analysis was utilized to test the assertion that social/living skills contributes to outcome in exposure and response prevention therapy. In the first set of analyses, the independent variables were the major social/living skills measures at Period 1 (SPSS-Total, SPSS-Positive, SPSS-Negative, SASS, ABSS, GRAI-Discomfort, GRAI-Probability). The dependent variables were the major outcome measures at each period (MOCI, LOI-Symptom, LOI-Trait). In this analysis, verbal IQ was included as a covariate (i.e., the effects of IQ were partialled out of the set of independent variables). Analyses were performed for each of the three time periods. In this manner, the relationship of the social/living skills, which each patient brings with him/her to therapy, is compared to outcome at each period.

For period 1, utilizing LOI-Symptom as the dependent measure, there was an effect for Frequency of Unpleasant Events, $F(1,9)=4.43$, $p<.10$ and $B=0.619$ ($\text{Sr}^2=.188$, accounting for 18.8% of the variance). Examination of the slope indicates
Table 3
Repeated Measures ANOVA for MOCI Across Three Time Periods

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>60.43</td>
<td>2</td>
<td>30.22</td>
<td>4.60</td>
<td>&lt; .02</td>
</tr>
<tr>
<td>Subject</td>
<td>1097.19</td>
<td>19</td>
<td>57.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>249.57</td>
<td>38</td>
<td>6.57</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protected t-tests for Period

1 vs. 2  \( t(38) = 1.00 \)
1 vs. 3  \( t(38) = 3.02, p < .01 \)
2 vs. 3  \( t(38) = 1.77, p < .10 \)
Figure 2
MOCI Score Means for the Three Testing Periods

<table>
<thead>
<tr>
<th>Testing Period</th>
<th>Mean Scores on MOCI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test</td>
<td>$\bar{X}_1 = 13.90$</td>
</tr>
<tr>
<td>Post-test</td>
<td>$\bar{X}_2 = 12.85$</td>
</tr>
<tr>
<td>Follow-up</td>
<td>$\bar{X}_3 = 11.45$</td>
</tr>
</tbody>
</table>
### Table 4
Repeated Measures ANOVA for LOI-Symptom Across Three Time Periods

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>145.90</td>
<td>2</td>
<td>72.95</td>
<td>2.63</td>
<td>&lt; .10</td>
</tr>
<tr>
<td>Subject</td>
<td>3670.85</td>
<td>19</td>
<td>193.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>1052.10</td>
<td>38</td>
<td>27.69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protected t-tests for Period

1 vs. 2  \( t(38) = 1.68, p < .10 \)
1 vs. 3  \( t(38) = 2.19, p < .05 \)
2 vs. 3  \( t(38) = 1.00 \)
Figure 3

LOI-Symptom Means for the Three Testing Periods

$\bar{x}_1 = 27.10$
$\bar{x}_2 = 24.30$
$\bar{x}_3 = 23.45$

Mean Score on LOI-Symptom

Pre-test (T₁)  Post-test (T₂)  Follow-up (T₃)

Testing Period
Table 5
Repeated Measures ANOVA for LOI-Trait Across Three Time Periods

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>43.03</td>
<td>2</td>
<td>21.42</td>
<td>3.48</td>
<td>.05</td>
</tr>
<tr>
<td>Subject</td>
<td>638.93</td>
<td>19</td>
<td>33.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>234.97</td>
<td>38</td>
<td>6.18</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protected t-tests for Period

1 vs. 2 \( t(38) = 1.00 \)
1 vs. 3 \( t(38) = 2.61, p < .05 \)
2 vs. 3 \( t(38) = 1.65 \)
Figure 4
LOI-Trait Means for the Three Testing Periods

<table>
<thead>
<tr>
<th>Testing Period</th>
<th>Mean Score (X)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-test (T₁)</td>
<td>( \bar{X}_1 = 13.40 )</td>
</tr>
<tr>
<td>Post-test (T₂)</td>
<td>( \bar{X}_2 = 12.65 )</td>
</tr>
<tr>
<td>Follow-up (T₃)</td>
<td>( \bar{X}_3 = 11.35 )</td>
</tr>
</tbody>
</table>
Table 6
Repeated Measures ANOVA for GRAI-Discomfort Across Three Time Periods

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>1377.63</td>
<td>2</td>
<td>688.88</td>
<td>3.50</td>
<td>&lt; .05</td>
</tr>
<tr>
<td>Subject</td>
<td>42142.58</td>
<td>19</td>
<td>2218.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>7486.38</td>
<td>38</td>
<td>197.01</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protected t-tests for Period

1 vs. 2 \( t(38) = 1.00 \)
1 vs. 3 \( t(38) = 2.61, p < .05 \)
2 vs. 3 \( t(38) = 1.66 \)
Figure 5
GRAI-Discomfort Means of the Three Testing Periods

Pre-test (T₁)
Post-test (T₂)
Follow-up (T₃)

\[ \bar{X}_1 = 122.20 \]
\[ \bar{X}_2 = 117.95 \]
\[ \bar{X}_3 = 110.60 \]
Table 7
Repeated Measures ANOVA for SPSS-Total Across Three Time Periods

<table>
<thead>
<tr>
<th>Source</th>
<th>SS</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Period</td>
<td>1321.23</td>
<td>2</td>
<td>660.62</td>
<td>2.45</td>
<td>&lt; .10</td>
</tr>
<tr>
<td>Subject</td>
<td>85521.65</td>
<td>19</td>
<td>4501.14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Error</td>
<td>10226.10</td>
<td>38</td>
<td>269.11</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Protected t-tests for Period

1 vs. 2 \( t(38) = 2.04, p < .05 \)

1 vs. 3 \( t(38) = 1.76 \)

2 vs. 3 \( t(38) = 1.00 \)
Figure 6

SPSS-Total Score Means for the Three Testing Periods

- $\bar{x}_1 = 243.10$
- $\bar{x}_2 = 253.70$
- $\bar{x}_3 = 252.25$

Testing Period

<table>
<thead>
<tr>
<th>Pre-test</th>
<th>Post-test</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>$T_1$</td>
<td>$T_2$</td>
<td>$T_3$</td>
</tr>
</tbody>
</table>
that endorsement of high frequency of Unpleasant Events is associated with higher (more pathological) LOI-Symptom scores. The converse may also be asserted, with endorsement of low frequency of unpleasant events being predictive of lower LOI-Symptom scores at Period 1. Also at Period 1, there was an effect for Frequency of Pleasant Events, $F(1,9)=5.05$, $p<.10$, and $B=0.449$ ($Sr^2=.214$, accounting for 21.4% of the variance). In this case, the slope indicates that higher pleasant event endorsement was associated with higher LOI-Symptom scores.

When LOI-Trait at Period 1 was analyzed as the dependent variable, an effect was found for Frequency of Unpleasant Events, $F(1,9)=9.03$, $p<.05$, $B=0.309$ ($Sr^2=.341$, accounting for 34.1% of the variance). As with the LOI-Symptom finding with Frequency of Unpleasant Events, this result was in the expected direction. Examination of the slope shows that higher Unpleasant Events scores are associated with higher (more pathological) scores on the LOI-Trait. In this set of analyses, no effects were evident for Periods 2 and 3.

A separate multiple regression analysis utilized Therapist and Patient Improvement Ratings at post-test (Period 2) as the dependent variables, and the social/living skills measure form Period 2 as the independent variables. When Patients’ Improvement Ratings were included as the dependent variable, there was an effect for GRAI-Discomfort, $F(1,9)=4.52$, $p<.10$
and $B=0.2245$ ($Sr^2=.162$, accounting for 16.2% of the variance). No effects were found when Therapists' Ratings were utilized as the dependent measure. It should be noted that the use of single-item scales (4 point improvement ratings) provides limited statistical power due to a lack of variability in the measure.

The analysis with Patient Fact Sheet single item scales as independent variables and the obsessive-compulsive measures as dependent variables revealed effects at multiple time periods. When LOI-Trait was employed as the dependent measure (at Period 1) an effect was found for the Anxiety Relief scale, $F(1,11)=9.98$, $p<.01$, and $B=2.535$ ($Sr^2=.352$, accounting for 35.2% of the variance). Examination of the slope indicates, for example, that subjects who report anxiety relief from rituals endorse significantly fewer obsessive-compulsive items on the LOI-Trait. An effect for the Secondary Gain scale item, with LOI-Trait as the dependent measure at Period 1, was also found, $F(1,11)=7.30$, $p<.05$, with $B=2.180$ ($Sr^2=.257$, accounting for 25.7% of the variance). In this case, high trait levels were associated with low degrees of secondary gain (i.e., low reported degree of involving others in ritual behaviors).

At Period 3, with LOI-Trait as the dependent measure, the MRA revealed a significant effect for the Expectations scale, $F(1,11)=5.11$, $p<.05$, $B=4.002$ ($Sr^2=.184$, accounting for 18.4% of the variance). Patients who initially reported
believing that the treatment program would not be very useful were associated with higher (more pathological) LOI-Trait scores at follow-up (Period 3). As in Period 1, there was a main effect for Anxiety Relief scale at Period 3, \( F(1,11)=3.52, p<.10, B=1.952 \) (Sr\(^2\)=.127, accounting for 12.7% of the variance) as well as for the Secondary Gain scale, \( F(1,11)=3.56, p<.10, \) with \( B=1.972 \) (Sr\(^2\)=.128, accounting for 12.8% of the variance).

In a separate set of multiple regression analyses, Period was treated as a within subject variable (same subjects measured at 3 different time periods). The major social/living skills measure as well as Period were included as independent variables and the major obsessive-compulsive outcome measures served as dependent variables. The analysis revealed significant main effects for Period for all dependent measures. Since this part of the analysis duplicates the findings of the ANOVAS reported earlier, under Hypothesis I, the details will be omitted from this report. Briefly, they replicate the finding that subjects improved on the major outcome measures during the course of treatment. This analysis also revealed a number of Period interaction effects which are reported below.

The raw regression coefficients (increments) were tested for subsequent simple effects utilizing a procedure outlined by
Pedhazur, 1982). These coefficients were tested for significance using the standard error for the linear combination of the regression coefficients, where the standard error is the sum of the elements in the variance-covariance matrix of the regression coefficients in the linear combination (see also Cohen & Cohen, 1983). With MOCI as the dependent variable, the interaction effects included Period x SPSS-Negative, $F(2,22)=7.58, p<.058, (Sr^2=.032)$. A simple effect for this interaction was found for the slope at Period 2, $t(22)=-2.34, p<.05$. The effect was in the expected direction with higher SPSS-Negative levels being related to lower MOCI scores. A Period x ABSS interaction effect, $F(2,22)=5.80, p<.05$ ($Sr^2=.025$) was also revealed by the analysis. Examination of slopes at each time period suggests that higher assertiveness levels were related to lowered MOCI score levels with the largest effect occurring at Period 3 (follow-up). Other interaction effects included Period x SASS, $F(2,22)=3.89, p<.05$ ($Sr^2=.017$) and Period x GRAI-Probability, $F(2,22)=3.57, p<.05$ ($Sr^2=.015$). While no simple significant effects were found for these interactions, examination of the slopes indicates a relationship between high SASS levels and lower MOCI scores and Period 1, as well as a relationship among high GRAI-Probability scores and lower MOCI scores at Period 2.

When LOI-Trait was included as the dependent variable, the
analysis yielded four Period interaction effects. An effect was found for Period x ABSS, $F(2,22)=7.51$, $p<.01$ ($Sr^2=.051$). Analysis of simple effects yielded $t(22)=3.60$, $p<.01$ for Period 3 slope. The Period x Frequency of Unpleasant Events effect, $F(2,22)=4.02$, $p<.05$ ($Sr^2=.027$) yielded a simple effect, $t=3.17$, $p<.01$ for Period 1. A Period x SPSS-Negative interaction effect, $F(2,22)=6.55$, $p<.01$ ($Sr^2=.045$) also yielded a simple effect, $t(22)=2.17$, $p<.05$ for Period 2. Finally, the analysis yielded a Period x GRAI-Probability effect with $F(2,22)=12.63$, $p<.01$ ($Sr^2=.086$). No simple effects were evident for this interaction.

**Hypothesis III Findings**

Zero order Pearson Correlations are presented for 1) validation of daily log data, i.e., log data with obsessive-compulsive measures (see Table 8) 2) the major independent (social/living skills) measures (see Table 9) and 3) the major dependent (outcome) measures (see Table 10). While significance levels were assessed, it is important to note that the intercorrelations of the measures serve exploratory questions. Thus, correlations which may not be statistically significant (yet indicate interesting directional qualities) are reported. In response to the question regarding validation of daily log (frequency and duration) data the following correlations are notable: The correlation between Log
Frequency at Period 3 and MOCI at Period 3 revealed $r=0.54$, $p<.10$. The correlation of Log Frequency (Period 3) with LOI-Symptom ($r=0.41$) and with LOI-Trait at Period 3 ($r=0.29$) are all in the positive direction, thus providing some evidence for validity of the log technique. The Log Duration data did not exhibit the same positive pattern with MOCI or with LOI scores. Log Frequency data at Period 2 were significantly correlated with Therapist Improvement Ratings ($r=-0.67$, $p<.05$).

The intercorrelations of the independent measures were examined in order to explore ways in which these measures are related. The values reported below represent intercorrelations of scores at the beginning of treatment (Period 1). The GRAI-Discomfort was correlated with SPSS-Positive ($r=-0.58$, $p<.01$) and with SPSS-Total ($r=-0.62$, $p<.01$). These values are in an expected direction, with higher levels of discomfort in assertiveness found to be related to lower scores in social performance. The ABSS was significantly correlated with GRAI-Discomfort ($r=0.50$, $p<.05$) and with GRAI-Probability ($r=-0.68$, $p<.01$). It is important to note that lower ABSS scores represent higher levels of assertiveness. The SPSS-Positive with GRAI-Probability revealed $r=0.56$, $p<.01$ and the SPSS-Total with GRAI-Probability yielded $r=0.40$, $p<.10$. The SASS was found to be significantly correlated with the following measures: GRAI-Discomfort ($r=-0.73$, $p<.01$), Frequency of Pleasant Events ($r=0.56$, $p<.01$), SPSS-Negative
(r=0.41, p<.10) and SPSS-Total (r=0.45, p<.05). Also of interest is the correlation of Verbal IQ with Frequency of Unpleasant Events (r=-0.47, p<.05).

The intercorrelations of the 3 major dependent measures (MOCI, LOI-Symptom, and LOI-Trait) revealed a significant correlation for MOCI with LOI-Symptom at Period 1, r=.57, p<.01 (r=.80 at Period 3). The LOI-Symptom and LOI-Trait were significantly correlated at Period 1 (r=0.47, p<.05).

**Hypothesis IV Findings**

Patient Improvement Ratings were found to be significantly correlated with Therapist Improvement Ratings (r=0.71, p<.01).

In addition, 80% of the patients rated themselves as being significantly improved at post-test (i.e., as reflected in a 3 or 4 scale rating on the 4 point improvement scale), while the therapist judged 50% of the patients as achieving a significantly improved status. The findings related to the issue of anxiety relief raised by Hypothesis V are reviewed in the section on Descriptive Data in the beginning of this chapter.
Table 8
Correlations Between Dependent Measures and Daily Logs

<table>
<thead>
<tr>
<th></th>
<th>Log-Frequency</th>
<th>Log-Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOCI</td>
<td>0.54*</td>
<td>-0.21</td>
</tr>
<tr>
<td>LOI-Symptom</td>
<td>0.41</td>
<td>0.22</td>
</tr>
<tr>
<td>LOI-Trait</td>
<td>0.29</td>
<td>0.05</td>
</tr>
</tbody>
</table>

*p < .10

**p < .05

***p < .01
### Table 9
Correlations Among the Independent Measures

<table>
<thead>
<tr>
<th></th>
<th>Verbal IQ</th>
<th>SPSS-Tot</th>
<th>SPSS-POS</th>
<th>SPSS-NEG</th>
<th>GRAI-Prob</th>
<th>GRAI-Dis</th>
<th>SASS</th>
<th>ABSS</th>
<th>FPleas</th>
<th>Fun Pleas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal IQ</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS-Tot</td>
<td>-0.29</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS-POS</td>
<td>-0.27</td>
<td>0.82***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS-NEG</td>
<td>-0.20</td>
<td>0.78***</td>
<td>0.29</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAI-Prob</td>
<td>-0.21</td>
<td>0.40*</td>
<td>0.56***</td>
<td>0.06</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAI-Dis</td>
<td>-0.09</td>
<td>-0.62***</td>
<td>-0.58***</td>
<td>-0.41*</td>
<td>-0.60***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SASS</td>
<td>0.05</td>
<td>0.45**</td>
<td>0.32</td>
<td>0.41*</td>
<td>0.34</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABSS</td>
<td>-0.09</td>
<td>-0.10</td>
<td>-0.28</td>
<td>0.13</td>
<td>-0.68***</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPleas</td>
<td>-0.21</td>
<td>0.37*</td>
<td>0.35</td>
<td>0.25</td>
<td>0.11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fun Pleas</td>
<td>-0.47**</td>
<td>-0.25</td>
<td>-0.08</td>
<td>-0.34</td>
<td>0.22</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)

* $p < .10$

** $p < .05$

*** $p < .01$
Table 9 (continued)

Correlations Among the Independent Measures

<table>
<thead>
<tr>
<th></th>
<th>GRAI-Dis</th>
<th>SASS</th>
<th>ABSS</th>
<th>FPleas</th>
<th>Fun Pleas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verbal IQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS-Tot</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS-POS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPSS-NEG</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAI-Prob</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GRAI-Dis</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SASS</td>
<td>-0.73***</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABSS</td>
<td>0.50**</td>
<td>-0.08</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FPleas</td>
<td>-0.29</td>
<td>0.56***</td>
<td>0.94</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Fun Pleas</td>
<td>0.22</td>
<td>-0.39</td>
<td>-0.10</td>
<td>-0.04</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*p < .10

**p < .05

***p < .01
Table 10

Correlations Among the Dependent Measures

<table>
<thead>
<tr>
<th></th>
<th>MOCI</th>
<th>LOI-Symptom</th>
<th>LOI-Trait</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOCI</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LOI-Symptom</td>
<td>0.57***</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>LOI-Trait</td>
<td>0.24</td>
<td>0.47**</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*p < .10

**p < .05

***p < .01
CHAPTER IV
DISCUSSION

The primary goal of this study was to assess the relationship between social/living skills and outcome of treatment for a group of obsessive-compulsive adults undergoing exposure and response prevention therapy. The effectiveness of this type of treatment has been documented (Marks, 1981) and its success has been previously explained in terms of a tension reduction model, discussed at length in the Introduction chapter of this paper. An alternative view of the reasons for success in this treatment approach emphasizes the role of skills for developing viable alternative behaviors to obsessive-compulsive rituals. Such a view de-emphasizes the importance of anxiety-relief as a critical factor in the maintenance of rituals, and focuses instead on other person-centered variables such as assertiveness and social performance abilities. Evidence for this alternative framework will be discussed in this section. In addition, issues related to consistency in therapist's behaviors, treatment effectiveness, relationship of assessment measures, anxiety relief and family factors, methodological considerations, and clinical observations will be reviewed.

Therapist Consistency

The calculated accuracy coefficient of 95% based on
independent review of therapy audiotapes indicates that the therapist was successful in covering the major exposure and response prevention topics across therapy sessions. This is not surprising since the agenda of the therapist is clearly delineated. The reliability checklist utilized by the rater is, however, limited to exposure and response prevention related activities. It is likely that other behaviors, not directly related to the treatment agenda, were occasionally emitted by the therapist. In sum, while it is evident that the therapist consistently engaged in appropriate exposure therapy related behaviors (e.g., reviewed daily logs, reviewed homework assignments, provided task examples), a multiple assessment of therapist behaviors would be needed to detect whether "other" types of treatment were being offered as well.

**Effects of Treatment**

The ANOVAs for the major dependent measures show that the patients as a group improved in terms of obsessive-compulsive symptomatology. This improvement was evident in all 3 major outcome measures (MOCI, LOI-Symptom, and LOI-Trait). This finding lends further support for the effectiveness of exposure and response prevention therapy in relieving obsessive-compulsive symptoms. The absence of a no-treatment control group is typical of outcome research in this area and is due to 1) the finding that obsessive-compulsive symptoms do not dissipate when left untreated (Leitenberg, 1976; Ananth, 1983;
Pollitt, 1969), thereby lessening the necessity of controlling for spontaneous recovery and 2) the difficulty in obtaining appropriate research subjects due to the rarity of the disorder (DSM-III, 1980). Nevertheless, the inclusion of such a group would strengthen the argument for the effectiveness of the treatment package. The improvement findings from this study do reflect major support for the efficacy of exposure and response prevention therapy due to the large sample size (n=20), which makes this one of the largest obsessive-compulsive behavior therapy studies reported to date. Thus, the findings of this analysis tend to confirm the general findings of other researchers who have found this technique to be useful (Marks, 1981; Foa & Steketee, 1982; Emmelkamp, 1982). The question of what is the effective treatment component is not, however, directly answered by the ANOVAs on the dependent measures.

The change across periods for the LOI-Trait is interesting in that it raises issues regarding the nature of the measure. The LOI-Trait scale is purported to be a characterological measure of obsessive-compulsive style (Cooper, 1970). This is in contrast to the LOI-Symptom scale which is purported to assess ritual type behaviors associated with obsessive-compulsive disorder. It is difficult to explain how significant characterological change (i.e., change in trait, rather than symptom) could occur in such a short period of time. In addition, the high correlation between the LOI-Trait and the
LOI-Symptom ($r=0.59$, $p<.01$ at Period 2) suggests that the two measures have much in common. Specifically, it may be that the LOI-Trait scale is, to a certain extent, a measure of obsessive-compulsive symptoms, rather than traits.

**The independent measures.** The improvements demonstrated by subjects as a group on two of the major social/living skills measures is indicated by the ANOVA results and is of considerable interest. These improvements are indicated by the steady improvement in assertiveness-related abilities (as indicated by the GRAI-Discomfort) and in social performance (as indicated by the SPSS-Total). While statements regarding treatment effects must once again be tempered due to the absence of an untreated comparison group, it may be inferred that the treatment procedure effected changes in some areas of social skills. This is surprising since exposure and response prevention procedures are not direct treatments for assertive or social performance deficits (i.e., compared to assertiveness training or social skills treatment packages). It is possible that therapist variables accounted for these changes. For example, the therapist may serve as a model for appropriate pro-social behaviors, such as maintaining eye-contact, clarity of communication, acting in a calm and friendly manner, and so on. By providing a forum for the discussion of compulsive-related problems, the patient may develop some degree of social-interactive skills.
Another possibility is that exposure and response prevention may act as a limited type of social skills training. For example, if a patient engages in an alternative to a bizarre looking ritual behavior (i.e., engages in response prevention while in a social situation), the alternative that he or she chooses may often be a new pro-social behavior which is in turn strengthened by the positive response it produces in others.

**Social Skills and Outcome**

A more direct examination of the contribution of social/living skills to outcome in exposure and response prevention therapy was examined by the series of multiple regression analyses. The first set of analyses, which examined the predictive utility of entry (Period 1) social skills levels for gauging outcome, provided limited evidence for the social skills/outcome hypothesis. The effects for Frequency of Unpleasant Events regressed upon 1) LOI-symptom and 2) LOI-Trait, suggest a relationship between high frequencies of unpleasant events and extent of pathology, but only at Period 1. To the extent that high frequencies of unpleasant events reflects an inability to derive more pleasurable effects from the environment (i.e., skill deficit), this finding may provide minimal support for the alternative set notion (Goldiamond, 1975) which argues that given a set of unpleasant alternatives,
it may be understandable why an individual would engage in a specified distressful (in this case, ritual) behavior. The effect for Pleasant Events at Period 1 for LOI-Symptom, however, provides evidence, albeit weak, that is contrary to the alternative set notion. This finding indicates a relationship between high pleasant events levels and greater pathology. The finding of no effects at Periods 2 and 3 for this particular analysis represents an absence of support for the importance of social/living skills in predicting outcome at the end of treatment. As will be discussed later, the within subject analysis provides greater support for this hypothesis.

The GRAI-Discomfort effect from the analysis in which improvement ratings by patient were utilized as dependent measures suggests that patients who experience low degrees of anxiety or discomfort associated with assertive behaviors exhibit lowered levels of obsessive-compulsive symptoms (according to their own report). However, the findings from this analysis indicate that lower discomfort associated with assertive behavior did not contribute to lessened obsessive-compulsive severity according to the therapist's judgement. This may be due, in part, to the general finding that the therapist tended to judge patient progress more stringently than did the patients (i.e., therapist ratings of improvement were lower than those of the patients). Alternatively, the self-report of improvement by patients may be
exaggerated, possibly due to their unwillingness to displease the therapist (i.e., a social desirability effect).

The separate within subject analyses (Period as a within subject variable) resulted in several effects which provide moderate support for the contribution of social/living skills to outcome. The Period interactions with SPSS-Negative, ABSS, SASS, and GRAI-Probability, when the Maudsley Obsessive-Compulsive Inventory (MOeI) was used as the dependent variable, suggest that the contributions of social skills to outcome is more salient at particular time periods. The Period x SPSS-Negative interaction demonstrated the largest effect (i.e., it subsequently revealed a simple effect at Period 2, and the zero order Pearson correlation of SPSS-Negative with MOeI at Period 2 was of sizable magnitude, r=-.60). This finding indicates that at post-test (Period 2), low levels of behaviors associated with poor social performance abilities (e.g., desire for revenge, inappropriate noise making, low frequency of helping behaviors) may be a contributing factor in outcome in terms of less severe obsessive-compulsive symptomatology. This finding could be construed as indirect support of the social skill/alternative behavior model, discussed in the Introduction chapter, in that low levels of inappropriate or negative social behaviors may act as a "first step" in building viable alternatives to obsessive-compulsive behaviors. That is, significant others in the social environment may at least begin
to respond to the patient, thereby enabling him/her to construct new repertoires.

The Period x ABSS interaction effect failed to produce a simple effect on subsequent testing of the raw regression coefficients (slopes). However, examination of the slopes (and the zero order Pearson correlations) suggests that assertive behavior played a role in lowered MOCI scores (less severe pathology) at post-test (Period 2) and follow-up (Period 3). It should be noted, however, that the ABSS is limited as a measure of assertiveness in that it explains degrees of assertiveness under a limited set of conditions (e.g., in restaurants, on grocery store lines) and does not distinguish assertiveness from aggression. This finding may, then, be said to provide some support for the relationship of a small area of assertive type abilities to outcome in treatment.

The Period x GRAI-Probability interaction lends further evidence to the claim that assertiveness skills contribute to outcome. The analysis of the raw regression coefficients, while failing to yield simple effects, suggests that assertiveness (specifically, the reported probability that patients would engage in assertive behaviors) is associated with lower degrees of obsessive-compulsive severity, at least at post-test (Period 2). By follow-up (Period 3), assertiveness, as measured by GRAI-Probability, was no longer found to be a contributor to outcome.
With LOI-Trait as the measure of success in treatment, similar interaction effects were revealed. These findings are strengthened by the presence of simple effects (with the exception of the Period x GRAI-Probability interaction). The Period x ABSS interaction and simple effect for the increment at Period 3 lend further support for the notion that assertive behavior is a contributor to outcome (i.e., lowered pathology). Along with the Period x GRAI-Probability effect for LOI-Trait and the previously discussed Period x assertiveness effects for MOCI, some support for Wolpe's (1958) contention that assertiveness deficits play a role in obsessive-compulsive disorder, has been provided.

The Period x SPSS-Negative effect for LOI-Trait demonstrates a similar finding to the Period x SPSS-Negative interaction and simple effect with MOCI as the dependent variable. Patients who exhibit lower levels of negative-type social behaviors appear to respond more positively to the treatment (as measured by these outcome measures at post-test). Thus, the Period interaction effects for MOCI and LOI-Trait, along with the GRAI-Discomfort effect with improvement ratings as the dependent measure, provide moderate support for the notion that social/living skills contribute to outcome by serving as the catalyst for the development of viable alternative behaviors. The limitations of self-report measures for assessing social skills is an important issue which will be
discussed later in the Methodological Considerations section, and which may be partly responsible for the absence of stronger support for Hypothesis 2 (that social/living skills will be found to contribute to outcome in exposure and response prevention therapy).

**Patient Fact Sheet Items**

The set of Multiple Regression Analyses utilizing six Patient Fact Sheet single-item item scales with the obsessive-compulsive measures provides information which has not been carefully scrutinized in other treatment studies for this disorder. The Expectations effect for Period 3 (LOI-Trait as dependent variable) indicates that those who expected the treatment program to prove useful, did obtain more successful outcomes by follow-up testing. This finding supports the contention of other therapy outcome investigators (e.g., Luborsky, Singer, & Luborsky, 1975) who have maintained the importance of this cognitive variable with regard to its relationship to outcome. The importance of patient expectations also points out the relevance of such pre-treatment variables as initial rapport between therapist and patient, and adequate pre-treatment preparation procedures (i.e., "selling the treatment" to the patient). It is possible that expectations can be manipulated, prior to treatment, so as to increase the probability of a successful outcome.

The Anxiety Relief and Secondary Gain scale effects at
Period 1 and Period 3 are related findings which bear on a main thesis of this study. Those patients who reported greater anxiety relief from performance of rituals achieved lessened obsessive-compulsive symptomatology. This supports the notion maintained by Marks (1981) that exposure and response prevention treats ritual behaviors by treating an anxiety problem (i.e., that response prevention leads to a dissipation of anxiety associated with the ritual). Furthermore, this finding serves as evidence for the notion that certain groups of patients (i.e., those whose problems are anxiety-related) will achieve direct improvement from exposure and response prevention, while others require a more extensive, non-linear program (e.g., Goldiamond, 1984).

The Secondary Gain Effect (Periods 1 and 3) suggests that those patients who receive considerable social attention for their problem (in the form of reassurance or assistance with rituals), achieve lower levels of obsessive-compulsive symptomatology. This finding suggests that exposure and response prevention may have ancillary effects. That is, the treatment may affect the ways in which patients are interacting with others in such a way as to decrease the involvement of significant others. This finding also suggests that patients who do not report involving others in their obsessive-compulsive problems (e.g., social isolates) may simply be more difficult to treat. For such patients, it may be necessary to construct new
social repertoires so that they are able to assert more worthwhile agendas for themselves. This inference is based on Goldiamond's treatise on alternative sets (Goldiamond, 1975) with implications for treatment discussed earlier in the Introduction chapter.

Use of Daily Log Data

The problems associated with self-monitoring data have been outlined elsewhere (e.g., Nelson, 1980) and include such areas of concern as compliance, reactivity, and validity. An exploratory question of this study was whether or not log data could be included or developed as a viable assessment device for outcome research on obsessive-compulsive disorder. Daily log recording is an arduous task which requires the patient to be actively involved, as often as every waking hour for a 13 week period (baseline to follow-up). Due to the extensive disruptions in patients' lives resulting from the disorder, it is difficult to obtain consistent compliance in daily recordings. For this reason, numerous investigators (e.g., Kirk, 1983; Foa, Steketee, & Milby, 1980) combined existing fragments of daily log information with other measures to form global judgement ratings by therapist. In this study, slightly more than half of the patients were able to comply fully with the demands of daily recording of frequency and duration of rituals. Thus, the validation findings are based on a small sample size and comments regarding the efficacy of the instrument must be offered in an exploratory fashion.
The strongest support was found for the use of Log frequency (counting the number of rituals emitted per day) rather than the Log Duration data (amount of time engaged in rituals per day). Across testing periods, the Log Frequency data was shown to be positively (and moderately) correlated with the major dependent measures (see zero order Pearson correlations reported in Hypothesis 3 Findings in Results). Furthermore, the correlation of Log Frequency with therapist improvement ratings ($r=-0.67, p<.05$) provides additional support for the adequacy of this Daily Log component. Examination of Log Duration and outcome measure correlations provided no evidence for the validity of log duration data as an outcome research tool. Further exploration of the validity of log data should utilize some type of direct observation method (i.e., a more absolute standard) for validating this assessment device.

**Social/Living Skills Measures**

The intercorrelations (zero order Pearson correlations) of the independent measures provided in the Hypothesis 3 Findings in the Results chapter provide information regarding the relationships among these measures. The Social Performance Survey Schedule (SPSS), particularly its positive and negative behavior subscales, has been shown to be correlated in the predicted direction with depression, social introversion, and observer's ratings of both social activity and social skill among
psychiatric patients and college students (Lowe, 1984; Lowe & Cautela, 1978). In this study, the SPSS-Total was found to be correlated in the expected direction with GRAI-Probability, GRAI-Discomfort, and SASS. These findings suggest that the SPSS may be tapping both assertive related abilities as well as general social skill and anxiety. The moderate correlation of the SPSS-Total with the Social Anxiety Survey Schedule (r=0.45, p<.05) is similar to the previous finding by Lowe and Cautela (1978) of the correlation of SPSS-Total with the Social Avoidance and Distress Scale (r=-0.42).

The SPSS-positive and SPSS-Negative have been reported to be independent scale measures of social skills (Lowe, 1984). These two measures were, in fact, not found to be significantly correlated. Both measures did, however, show a relationship with the GRAI, with the SPSS-Positive yielding correlations in the expected direction with both the Discomfort and Probability scales, and the SPSS-Negative revealing a significant relationship to the Discomfort scale. In sum, these findings provide further moderate validation evidence for the Social Performance Survey Schedule.

In addition to the numerous significant correlations of the GRAI scales with the SPSS, the Gambril-Richey Assertiveness Inventory demonstrated significant correlations with the other assertiveness inventory utilized in this study, the ABSS. The GRAI-Discomfort also yielded a strong relationship with the SASS
(Social Anxiety Survey Schedule) in the expected direction. This strong relationship between the Discomfort scale and the SASS would be expected since both are purported to tap degrees of social distress. Since little information regarding the relationship of the SASS (Cautela, 1977) to other measures of social/living skills has been reported in the literature, the findings for this measure are of particular interest. As mentioned previously, the SASS was found to be highly correlated with the GRAI-Discomfort, lending support to the notion that the measure taps social distress-related problems. The moderate to high correlation between SASS and Frequency of Pleasant Events is interesting in that it supports the notion that high levels of skills result in the exacting of positive benefits from the natural environment. This is an issue in the present study, which postulated that high levels of social skills results in the production of viable alternative activities to ritual behaviors. The SASS correlation with SPSS-Negative is similar to the SASS correlation with GRAI-Discomfort in that it reflects a capacity to assess problems associated with social behaviors (e.g., discomfort, anxiety, inappropriate tendencies). In sum, support for the use of SASS as a measure of social anxiety has been provided. However, validation based on utilization of non self-report devices (e.g., in vivo evaluations) would result in more useful evidence for the use of these measures.

Finally, the significant correlation of Verbal IQ with
Frequency of Unpleasant Events casts doubt upon the usefulness of the measure. If a sizeable proportion of the variance in this measure can be accounted for by the IQ level of the respondent, then the measure may not be an accurate indicator of information regarding unpleasant activities. Individuals with higher IQ levels tend to report lower frequencies of unpleasant events. This may be linked to the ability, on the part of high IQ subjects, to predict negative personal consequences for reporting high levels of unpleasant events (e.g., that they will be perceived as socially unattractive or unskilled). In any case, this finding suggests that the use of this measure for research purposes should at least include verbal IQ as a covariate.

**Dependent measures.** The moderate to high correlations among the various combinations of LOI-Symptom, LOI-Trait, and MOCI support the notion that these are related measures of obsessive-compulsive severity. The correlation between LOI-Symptom and LOI-Trait provides evidence contrary to the contention that these are orthogonal scales measuring extensiveness of symptomatology and character disorder, respectively (Cooper, 1970). The relationship between these scales, combined with the finding that LOI-Trait scores changed significantly across time periods (i.e., patients’ LOI-Trait
scores improved during treatment) suggest that the Trait scale may, to a considerable extent, be a measure of symptoms. Future research on this measure should explore the reliability and validity of a combined symptom and trait score and its sensitivity as a research tool.

The Pearson correlations of Improvement Ratings with the outcome measures proved to be disappointing. Ratings by therapist and patient were not found to be correlated with either the MOCl or the LOI-Symptom. This finding does not lend support for the use of such global ratings. Since most outcome studies on behavioral or psychopharmacological approaches to obsessive-compulsive disorder have relied heavily on these types of ratings, this discovery is of particular relevance. It is important that ratings, like the other measures discussed here, be validated against direct observation procedures (e.g., recording by significant others or by trained observers).

Finally, while Therapist and Patient Ratings were highly correlated (r=0.71, p<.01), 80% of the patients reported significant improvement while the Therapist rated only 50% as having made significant improvement. This finding underlines the importance of utilizing a variety of outcome tools, rather than relying on, for example, global improvement reports by patients. When assessing the usefulness of improvement ratings, the investigator must take into consideration the consequences controlling both therapist and patient evaluations. For
example, a patient's ratings may be influenced by social desirability factors while the therapist may be influenced by expectancy variables.

**Anxiety Relief**

The issue of anxiety relief associated with performance of ritual behaviors is critical to explaining the nature of obsessive-compulsive disorder, as well as delineating effective treatment components of exposure and response prevention. The major investigators in this area (e.g., Marks, 1981; Emmelkamp, 1982; Foa, Steketee, & Milby, 1980) have maintained that it is relief from anxiety which reinforces ritual behaviors. Thus, they argue that exposure and response prevention reduces ritual behavior by teaching the patient how to allow anxiety to dissipate without engaging in a ritual behavior.

The Descriptive Features information (Table 2) indicates that 80% of the subjects in this study reported significant anxiety relief following ritual performance. While it is important to note that the information in Table 2 is provided without comparison information on normal or other psychiatric populations, the 80% figure is impressive and consistent with previous findings (Emmelkamp, 1982). This finding is supportive of the role of anxiety-relief in maintaining ritual behaviors, but does not establish anxiety as the cause of these behaviors. It is conceivable that anxiety relief is an effect, rather than a cause of ritual behaviors. It may be that anxiety is shaped
up in obsessive-compulsive sufferers and serves as a rationale for avoiding engaging in alternative activities. Regardless of this distinction, the above finding, combined with the previously discussed discovery that those subjects who report anxiety following ritual performance achieve a more successful outcome in treatment, suggest that exposure and response prevention therapy may have differential effects depending on the characteristics of the patient. These findings suggest that the presence or absence of anxiety relief associated with ritual performance may be one of these critical characteristics.

Other Fact Sheet Findings/Family Factors

The finding that 55% of the patients reported growing up in a socially isolated family is similar to the 60% social isolation finding reported by Hoover and Insel (1984) from a smaller (n=10) sample of obsessive-compulsive patients. While interpretation of such figures are made difficult by both the small sample sizes and the absence of a comparison group, these data suggest that the development of adequate social skills is a factor in the development of obsessive-compulsive behavior. The finding that 65% of the patients reported being socially unskilled prior to treatment lends further credence to this notion. More importantly, these descriptive data suggest future directions for research on family factors in obsessive-compulsive disorder, which have not been addressed in this study.
Methodological Considerations

As discussed previously in the Discussion chapter, independent evaluations of therapist's consistency across sessions was accomplished, using a checklist of exposure and response prevention related behaviors. Future studies in this area should expand this check-list to include non-exposure and response prevention related behaviors. This would be useful for exploring whether other behaviors are being emitted by the therapist (e.g., pro-social verbal behaviors, questions about childhood, etc). This is important since unnoticed therapist behaviors may serve as effective components of the treatment.

Another experimental issue of concern has to do with the reliance on self-report measures of social skills. Investigators Millbrook, Farrell, & Curran (1983) have appropriately described the assessment of social skills as a "veritable Gordian knot," referring to the inability of researchers to agree on the behavioral components of social skills. In addition, the validity of the measures has been brought into question due to the variability in findings regarding their relationship to in vivo evaluations (Hersen & Bellack, 1981). Improvements in this area await the development of more psychometrically sophisticated assessment procedures as well as in vivo role-play rating procedures such as the Behaviorally-Referenced Rating system of Intermediate Social Skills (Rabinowitz, Farrell, Shaye, & Styles, 1983). The
Interspersonal Behavior Survey (Mauger, Adkinson, Zoss, Firestone, & Hook) also represents a movement toward development of increasingly sophisticated research tools.

In this study, different types of obsessive-compulsive disorder were examined as a homogeneous group. Thus, distinctions between patients with checking or washing (contamination-related) rituals were not made. This was due to the small sample size (n=20) which does not allow for such subgroup distinctions. A study employing a larger sample of obsessive-compulsives would allow for examination of the role of a variety of potentially important variables, such as sex, ethnicity, age group, and type of rituals. In a larger predictive study, these variables could be handled statistically by utilizing dummy codes in a multiple regression analysis. Rachman (1976), for example, has proposed separate types of maintenance factors for individuals with cleaning and checking rituals. Specifically, he has asserted that checking rituals serve "prevention" or avoidance functions, while cleaning rituals serve "restorative" functions. These questions should be examined in future large scale studies.

A final methodological consideration for future work in this line of research involves the examination of those patients who fail in behavior therapy. Foa and her colleagues (Foa, Steketee, Grayson, & Doppelt, 1979) have delineated a number of areas for such research, including level of depression, failure
in emotional processing, and other cognitive variables. Future research on treatment of obsessive-compulsives should include a case by case examination of those who fail. Follow-up interviews may provide clues as to "other" factors (e.g., marital problems, work-related difficulties) which may be indirectly maintaining obsessive-compulsive behaviors. This information could be useful for designing new studies and methodologies in this area.

**Clinical Observations**

Tharp (1981) has provided a useful guide for program evaluation which includes "personal" or "qualitative knowing" as a critical component. This personal knowledge reflects the integration of experience rather than exclusive reliance on quantitative information. Some qualitative information derived from treating 20 patients diagnosed as obsessive-compulsive is reported here briefly. These findings are not presented as experimental findings and therefore require further empirical investigation.

The ego-dystonic/syntonic distinction is required for diagnostic purposes (DSM-III, 1980) and is often difficult to achieve. All of the patients in this study reported "competing" thoughts or beliefs regarding the senselessness of their ritual activities. A typical comment by an obsessive-compulsive
patient during a screening interview was that "A part of me knows that my actions are senseless, but another part of me feels that these actions are necessary." The therapist must probe further and form a judgement regarding which competing position is strongest or most likely to prevail. It seems likely that patients who are adamant in their belief that their ritual behaviors make sense will be less likely to adhere to the therapist's instructions to block these responses. In addition, in the case of patients who report symptoms as ego-dystonic (i.e., not senseless), the therapist is advised to explore the possibility of a more formal thought disorder or psychosis.

An important issue for clinical practice of exposure and response prevention is the construction of a hierarchy of exposure-related homework tasks. It is important for patients to have an initial success experience in order that they not become discouraged with the treatment plan and drop out at an early stage. Thus, the treatment should proceed initially with small increments in task difficulty. The therapist must employ his/her judgement as to when these increments can safely be increased. These judgements must take into consideration such variables as patient fragility, self-esteem, and expectations.

Finally, the issue regarding the extensiveness of therapist involvement in in-vivo exposure and response prevention tasks has not been adequately explored by other investigators. While it seems obvious that the therapist should refrain from physical
contact with the patient, precisely how forceful the therapist should behave is a difficult question to answer. The therapist must analyze each case separately and make judgements regarding a variety of factors. These include variables previously mentioned such as "fragility" (i.e., how much anxiety can they withstand before escaping?) as well as tolerance for embarrassment (e.g., if the patient fails the task or is required to perform a task in a public place). The therapist must be careful to design in vivo tasks in which he feels 1) confident that the patient will be capable of completing 2) which are related to the ritual problem and 3) will benefit the patient.

Conclusion

This study corroborates the findings of other investigators (e.g., Marks, 1981; Emmelkamp, 1982) that exposure and response prevention is an effective technique for reducing obsessive-compulsive behaviors. This type of behavior therapy was shown to be particularly effective for those individuals whose ritual behaviors were anxiety-related (i.e., for patients who experience anxiety relief following performance of rituals).

The data from this outcome study also indicated that exposure and response prevention resulted in improvements in certain types of social/living skills, particularly in the areas of social performance and discomfort associated with assertive behavior. Furthermore, only moderate support was found for the
notion that social/living skills contribute significantly to outcome in exposure and response prevention therapy.

In sum, the findings of this study suggest that a revision of the original thesis is in order. In the Introduction chapter, a model was presented which emphasized the importance of development of alternative behaviors. Response prevention was viewed as an instructional command to stop engaging in ritual behaviors. It was then hypothesized that high social/living skills patients would readily develop appropriate alternative behaviors, while low social/living skills patients would not develop appropriate alternative behaviors, and would instead relapse. A revised model, one which integrates the findings of this study, offers a more complex explanation. For a majority of obsessive-compulsive patients, anxiety-relief may in fact be the primary catalyst for ritual behaviors (i.e., anxiety-relief acts as the critical reinforcer). For these patients, exposure and response prevention is an appropriate treatment since it treats the anxiety problem. This notion is supported by several findings in this study, including the fact that 80% of the patients report experiencing anxiety relief after engaging in rituals. However, for other patients, anxiety may not be the critical reinforcer. Exposure and response prevention is therefore not relevant for these patients, who instead require a more extensive functional analysis of the problem (Queiroz, et al., 1981) and possibly a non-linear type of intervention (Goldiamond, 1984).
The problem of obtaining accurate assessments of both social/living skills and obsessive-compulsive symptomatology was discussed in this paper. The limitations of self-report measures of social skill have been documented (e.g., Hersen & Bellack, 1981) and the need for psychometrically sophisticated instruments for research purposes is evident. Also, the use of self-monitoring techniques (daily logs) with psychiatrically disabled populations requires further examination. In this study, Log Frequency data were found to be related to other established outcome measures, while Log Duration data were not found to be valid measures.

Finally, the importance of examining failures in exposure and response prevention therapy (Foa, et al., 1980), in a case by case manner, should be considered in future research. While group statistical techniques are useful for providing information about groups, they may also conceal information about characteristics of individual subjects. A closer examination of individuals who fail in this type of therapy may add to our personal knowledge (Tharp, 1981) regarding obsessive-compulsive disorder, and provide us with interesting leads for future studies in this area.
References


positive behavior subscale. Unpublished manuscript, Department of Psychology, Rutgers University (Camden).


Interactive assessment of social skill and anxiety: a look
at subject and confederate component behaviors. Paper presented at Association for Advancement of Behavior Therapy, Washington, D.C.


   Behaviour Research and Therapy, 14, 269-277.
   acquisition: A critical examination. Behaviour Research and 
   Therapy, 15, 375-387.
Rachman, S., & Hodgson, R.J. (1980). Obsessions and 
Rachman, S., Hodgson, R.J. & Marks, I.M. (1971). The 
   treatment of chronic obsessive-compulsive neurosis. 
   Behaviour Research and Therapy, 9, 237-247.
Rachman, S., Marks, I.M., & Hodgson, R.J. (1973). The 
   treatment of obsessive-compulsive neurotics by modeling and 
   flooding in vivo. Behaviour Research and Therapy, 11, 
   463-471.
Rachman, S., Cobb, J., Grey, S., McDonald, R., Mawson, D., 
   Sartory, G., & Stern, R. (1979). Behavioural treatment of 
   obsessive-compulsive disorders, with and without 
   clomipramine. Behaviour Research and Therapy, 17, 467-468.
Rapoport, J., Elkins, R., Langer, D.H., Sceery, W., 
   Buchsbaum, M.S., Gillin, J.C., Murphy, D.L., Zahn, T.P., 
   obsessive-compulsive disorder. American Journal of 
   Psychiatry, 12, 1545-1555.
Reed, G.F. (1968). Some formal qualities of obsessional 
   thinking. Psychiatria Clinica, 1, 382-392.


Templer, D.I. (1972). The obsessive-compulsive neurosis:


APPENDIX I
Reliability and Validity Information

Social Performance Survey Schedule (Lowe & Cautela, 1978)
Reliability: Pearson test-retest for SPSS-Total, $r = .87$
for SPSS-Positive, $r = .88$; for SPSS-Negative, $r = .85$;
Coefficient alpha = .94 (college students) and .94
(psychiatric patients, Lowe, 1984).
Validity: Pearson Correlation for SPSS-Total with SAD,
SPSS-Total with SAD, $r = -.42$; for SPSS-Positive with SAD,
$r = -.39$; for SPSS-Negative, $r = -.31$.

Gambril and Richey Assertive Inventory (Gambrill & Richey, 1975)
Reliability: Pearson test-retest for GRAI-Discomfort,
$r = .87$; for GRAI-Probability, $r = .81$ (college students).
Pearson test-retest (this study) for GRAI-Discomfort,
$r = .80$; for GRAI-Probability, $r = .97$
Validity: Spearman rank correlation between observer
ratings of discomfort and changes in Inventory scores,
$r = .47$ (Gambril, et al., 1975). For O-C patients (this
study), Pearson correlation for GRAI-Discomfort with SPSS-
Positive, $r = -.58$; and with SPSS-Total, $r = -.62$. GRAI-
Probability with SPSS-Positive, $r = -.68$.

Assertive Behavior Survey Schedule (Cautela & Upper, 1976)
Reliability: Pearson test-retest, $r=.71$

Validity: Correlation with GRAI-Discomfort, $r=.50$; and with GRAI-Probability, $r=-.68$ (O-C patients).

Social Anxiety Survey Schedule (Cautela, 1977)

Reliability: Pearson test-retest, $r=.79$

Validity: Correlation with SPSS-Negative, $r=.41$; with SPSS-Total, $r=.45$; with GRAI-Discomfort, $r=-.73$ (O-C pts.)

Frequency of Pleasant/Unpleasant Events (MacPhillamy & Lewinsohn, 1971)

Reliability: Pearson test-retest for Pleasant Events, $r=.76$; for Unpleasant Events, $r=.73$ (O-C pts.)

Validity: Correlation of Pleasant Activities with mood ratings for depressed ($r=.36$), psychiatric ($r=-.43$), and normal ($r=-.25$) populations (Lewinsohn & Graf, 1973)

Maudsley Obsessional-Compulsive Inventory (Hodgson & Rachman, 1977)

Reliability: Alpha Coefficient=.80; Kendall’s tau for test-retest with normals, .80 (Hodgson, et al., 1977)

Validity: Correlation with Leyton Inventory, $r=.60$; correlation with therapist improvement ratings, $r=.67$ (Hodgson, et al., 1977)

Leyton Obsessional Inventory (Cooper, 1970)

Reliability: Pearson test-retest for Symptom, $r=.87$; and for Trait, $r=.91$ (Cooper, 1970)

Validity: Correlation of Symptom score with Eysenck’s
Neuroticism, $r = .53$; Trait score with Neuroticism, $r = .30$
Symptom score with Extraversion, $r = .30$ (Cooper, 1970)
APPENDIX II

The Assessment Measures and Consent Forms
INFORMED CONSENT TO PARTICIPATE IN RESEARCH

You are being asked to volunteer to be a subject in a research study. This form is designed to provide you with information about this study which you should know and to answer any of your questions.

PROJECT DIRECTOR: Lowell Anderson, Ph.D.

TITLE OF RESEARCH STUDY: "The Effects of Short-Term Behavior on Obsessive Compulsive Disorder"

☐ This research study includes procedures that may change the treatment you would otherwise receive. We hope the knowledge gained will be of benefit to you.

☐ This research study includes procedures which may not give you immediate benefits. It is hoped the knowledge gained will be of benefit to others in the future.

☐ This research study is planned to select your treatment by chance. It is not known if the treatment you will receive will be of benefit to you.

THE PURPOSE OF THE RESEARCH IS: to examine the effects of a short-term behavior therapy on obsessive-compulsive symptoms, and to learn about the types of skills individuals utilize in reducing the severity of this disorder.

DONATION OF BLOOD: ___________ cc. (equivalent to _______ ounces). Frequency of withdrawal: _____________________. The potential risks of donating blood, none of which are likely to occur, may include pain, bruising, fainting or a small infection at the puncture site.

THE FOLLOWING PROCEDURES WILL BE INVOLVED: (IF LIMITED TO DONATION OF BLOOD, LEAVE BLANK.) All subjects will receive 10 sessions of a type of behavior therapy called exposure therapy and response prevention. Subjects will also be required to complete 6 questionnaires and maintain a daily log or diary in which symptoms are recorded.
THE POTENTIAL RISKS OR DISCOMFORTS TO YOU ARE:

The maintenance of daily logs is moderately demanding as it will require subjects to take time from their daily routines in order to monitor problem behaviors. Some participants may experience some anxiety when carrying out therapy homework assignments.

THE POTENTIAL BENEFITS TO YOU OR TO OTHERS ARE:

You will receive no direct benefit. However, it is hoped that the knowledge gained will help to alleviate obsessive compulsive symptoms and learn one aspect of short-term behavior therapy.

GENERAL CONDITIONS - Should you consent to participate in this research, your identity will be kept confidential. You may change your mind at any time. Refusal to participate will not harm your relationship with the faculty and attending staff.

AGREEMENT TO PARTICIPATE

I have read the above description of the research study and general conditions (or it was read to me by: ), Anything I did not understand was explained to me by: , and any questions I had were answered by: . In consideration of this understanding, I voluntarily agree to participate in this research at: New York University Medical Center □ Bellevue Hospital □ Goldwater Hospital

☐ Other: ____________________________

Name of Subject ____________________________

Signature of Participant ____________________________ Date ____________________________

Signature ofWitness ____________________________ Date ____________________________

Signature of Parent or Legal Representative* ____________________________ Date ____________________________

Signature of Investigator ____________________________ Date ____________________________

Print Name of Legal Representative

*If subject is unable to provide informed consent, this agreement must be signed by a parent or other legal representative. For children between the ages of 12 and 17, their signature is generally required in addition to that of the parent or legal representative.
Patient Fact Sheet

Name: __________________________

Date: __________________________

Address: _________________________ Phone: __________

______________________________

Date of Birth: ___________________ Age: ___

Sex (circle): M F

Ethnicity/Religion: ________________

Race: ____________________________
(e.g., Black, Hispanic, White, Native American, Pacific Islander)

1. How long have you experienced obsessive-compulsive (O-C) symptoms (years/months)? ________________

2. Have other members of your family (e.g., brothers, sisters, parents or grandparents) exhibited O-C symptoms? If so, list these members and briefly describe symptoms:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

3. Please list history of all psychiatric illnesses and hospitalizations:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

4. Are you currently taking any medications? Please list below:

________________________________________________________________________

________________________________________________________________________

5. Describe history of major illness other than psychiatric illness:

________________________________________________________________________

________________________________________________________________________
6. Are you currently taking any drugs for recreational or addictive purposes? (YES NO) If yes, list drugs: ________________________________

7. Are your O-C symptoms best described as (circle)?
   1. washing or contamination related
   2. checking
   3. obsessional slowness
   4. obsessional doubting
   5. counting to oneself or other repetitive thoughts
   6. other (describe): ________________________________

8. Do you feel that you O-C rituals are senseless (circle)?
   1  2  3  4
   YES YES, NO, NO
   PROBABLY PROBABLY NOT

9. Do you experience relief from anxiety when the ritual is performed?
   1  2  3  4
   YES YES, ONLY NO
   VERY MUCH SO SOMETHAT SLIGHTLY

10. Do you delay the ritual in an effort to resist the ritual?
    1  2  3  4
    YES SOME OF RARELY NO
    THE TIME

11. What is the frequency of the O-C thought or ritual?
    1  2  3  4
    INFREQUENT FROM TIME A CONSIDERABLE CONSTANT
    TO TIME AMOUNT OF TIME

12. How many hours/minutes per day would you estimate that you engage in your O-C rituals or thoughts? ________________________________

13. To what extent does the problem interfere with day to day living and activities?
    1  2  3  4
    MILD MODERATE MODERATE SEVERE

14. What is the duration of each episode (length of ritual)? ______

15. How many rituals per day? ________________________________

128
16. Do your O-C rituals interfere with social relationships?

   1       2       3       4
   MILD    MODERATE MODERATE SEVERE
            SEVERE

17. Do you keep your rituals secret from those closest to you?

   1       2       3       4
   YES     SOMEWHAT MOSTLY NOT NO

18. To what extent do you involve others in your rituals?

   1       2       3       4
   VERY OFTEN SOME OF RARELY NEVER
   THE TIME

19. Was there a traumatic event associated with the onset of O-C symptoms? (circle): YES NO

   If yes, describe briefly: ___________________________________________

20. How would you describe your ability to make friends and enjoy the daily activities of living?

   1       2       3       4
   HIGHLY SKILLED MODERATELY SKILLED LACKING IN SKILLS
            UNSKILLED

21. How would you describe your ability to act assertively?

   1       2       3       4
   ASSERTIVE MODERATELY LACKING UNASSERTIVE ASSERTIVENESS
            ASSERTIVE

22. To what extent do you engage in pleasant activities?

   1       2       3       4
   MUCH OF THE TIME SOMEWHAT NOT VERY NOT ANXIOUS
            FREQUENTLY OFTEN
23. Do you get anxious when meeting new people or making new friends?

1. VERY ANXIOUS
2. SOMEWHAT ANXIOUS
3. HARDLY ANXIOUS
4. NOT ANXIOUS

24. If you are anxious for some other reason, does it make the compulsions worse?

1. YES
2. SOMEWHAT
3. HARDLY AT ALL
4. NO

25. Do you believe that our program is likely to help you with your O-C problem?

1. LIKELY TO HELP
2. IT MIGHT HELP
3. PROBABLY WILL NOT HELP
4. UNLIKELY TO HELP

26. When you were growing up to what extent did your parents spend time with other friends?

1. OFTEN WITH OTHER FRIENDS
2. SOME OF THE TIME WITH FRIENDS
3. NOT VERY OFTEN WITH FRIENDS
4. ALMOST NEVER WITH FRIENDS
PLEASE NOTE:

Copyrighted materials in this document have not been filmed at the request of the author. They are available for consultation, however, in the author's university library.

These consist of pages:

- PLEASANT EVENTS SCHEDULE Form III-S: 131
- UNPLEASANT EVENTS--MOOD RELATED ITEMS: 132
- PLEASANT ACTIVITIES--MOOD RELATED ITEMS: 133
- ASSERTIVE BEHAVIOR SURVEY SCHEDULE(ABSS): 134
- SOCIAL PERFORMANCE SURVEY SCHEDULE(SPSS): 135-140
- SOCIAL ANXIETY SURVEY SCHEDULE(SASS): 141-142
- MAUDSLEY OBSESSIONAL-COMPULSIVE (MOC) INVENTORY: 143-144
- LEYTON OBSESSIONAL INVENTORY: 145-148