EXPECTATIONS OF THE DURATION AND

EFFECTIVENESS OF PSYCHOTHERAPY:

A DELAY DISCOUNTING

PERSPECTIVE

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CHAPTER I

INTRODUCTION

Models designed to describe the progress that clients make over time in psychotherapy are abundant (e.g., Bandura, 1977; DiClemente & Prochaska, 1982; Rogers, 1958). One such model is the dose-effect model, which states that with increasing doses of psychotherapy a greater proportion of patients are likely to show improvements or gains. Although evident in earlier research (Jacobs & Warner, 1981; Jones, 1980; Mensh & Golden, 1951; Strassberg, Anchor, Cunningham, & Elkins, 1977), this model was first introduced by Howard, Kopta, Krause, and Orlinsky (1986).

In their 1986 meta-analysis, Howard et al. were interested in examining the relationship between the number of sessions of individual psychotherapy received and the percentage of clients who improved. Using probit analysis Howard et al. examined outcome data for over 2,400 clients included in 15 different studies. Findings from this meta-analysis indicated that 10% to 18% of clients improved prior to the first session of psychotherapy, 48% to 58% of clients were considered improved after 8 sessions, about 75% of clients were considered improved at six months of treatment (26 sessions), and about 85% of clients were considered improved at one year of treatment (52 sessions). Based on this data, the dose-effect relationship forms a negatively accelerated curve, indicating that with a greater number of sessions there is a greater likelihood of improvement; however, diminishing returns can be expected as the dosage increases.

The introduction of the dose-effect relationship of psychotherapy made by Howard et al.'s (1986) meta-analysis sparked much interest and further research in the area. Since the release of the seminal article, studies have explored the dose-effect relationship within diagnostic categories and symptom categories, in outpatient populations, using trainee clinicians, using a change criteria of clinical significance as compared to improvement, and using session-by-session survival analysis as compared to pre-post-probit analysis (Barkham, Rees, Shapiro, Hardy, Stiles, & Reynolds, 1996; Callahan & Hynan, 2005; Draper, Jennings, Baron, Erdur, & Shankar, 2002; Hansen & Lambert, 2003; Kadera, Lambert, & Andrews, 1996; Kopta, Howard, Lowry, & Beutler, 1994; Lambert, Okiishi, Finch, and Johnson, 1998; Lueger, Lutz, & Howard, 2000). Although slightly different percentages of improved clients have been found across studies, a negatively accelerated dose-effect relationship similar to Howard et al.'s has been demonstrated.

In attempting to summarize the results from the previous published literature on the dose-effect relationship, Hansen, Lambert, and Forman (2002) examined the data from seven studies dating back to the original Howard et al. meta-analysis. In these studies a range of 5 to 104 sessions was required to reach a 50% patient improvement rate. Hansen et al. believed that this large range could be a result of measurements on different symptoms, using different methods to measure outcome (pre- post- test compared to session-by-session), and using different methods to analyze the data (probit analysis compared to survival analysis compared to observed percentages). When taking these differences into account, Hansen et al. concluded that there is a general consensus that between 13 and 18 sessions of therapy are required for 50% of patients to improve.

Hansen et al. also concluded that patients who continue in treatment after the median number of sessions continue to show improvement, indicating that more treatment results in a greater proportion of patients recovering.

Hansen et al.'s (2002) review also included an analysis on the course of therapy for over 9,100 clients seen at a number of sites across the nation. In this sample, 3,101 clients (33%) terminated after only one session of therapy. Of the remaining 6,072 clients the average number of sessions of therapy was 5, with a median of 3 sessions. These findings are somewhat surprising given that the seminal dose effect model (Howard et al., 1986) and the dose effect literature (Hansen et al., 2002) indicate that between 13 and 18 sessions are needed for 50% of clients to show improvement. Based on this data, Hansen et al. concluded that clients, on average, do not get adequate exposure to psychotherapy to produce positive outcomes.

Clients who do not get adequate exposure to psychotherapy are usually referred to in the established literature as premature terminators or drop-outs. Many studies indicate that a large number of clients, between 40% and 60%, terminate therapy before they have seen any reliable benefits (Clarkin & Levy, 2004; Garfield, 1994; Wierzbicki & Pekarik, 1993). Although many different variables may be related to premature termination, Garfield suggests that unmet client expectations may play the largest role.

In an early study examining the relationship between unmet expectations and premature termination, Pekarik (1983) asked 46 clients who were seen in an outpatient clinic and terminated therapy prematurely their reasons for termination. Pekarik found that of these premature terminating clients, 39% terminated because they felt they no longer needed the services, 35% terminated due to environmental restraints, and 26%

terminated due to dissatisfaction. In a similar study with 74 premature terminating clients Acosta (1980) found the dominant reason given for terminating early was perception that the therapy was not beneficial. Further studies comparing premature to full term clients show that premature terminating clients are much more likely to indicate that therapy had not met with their outcome expectations (Garcia & Weisz, 2002; Hansen, Hoogduin, Schaap, & deHann, 1992).

Attempts have been made to measure the actual expectations of treatment length for psychotherapy. In one such study, Pekarik and Wierzbicki (1986) examined the expected treatment length in 148 outpatient clients. Prior to treatment clients were asked "How many visits do you think you'll attend?", given the options of 1-2, 3-5, 6-10, 11-15, 16-20, 21-25, 26+, as well as "what type of therapy do you prefer?", given the options of a relatively brief treatment and a considerably longer treatment. Of these clients 20.3% expected to attend 1-2 sessions, 28.4% expected to attend 3-5 sessions, and 24.3% expected to attend 6-10 sessions of treatment. These results indicate that a total of 73% of the clients expected to attend 10 or fewer sessions of treatment. Similar results have also been found in more recent studies (Mueller & Pekarik, 2000; Pekarik, 1991)

Previous studies assessing expected treatment duration have all used similar methods; directly asking clients to indicate the number of sessions they think they will attend. However, when considering treatment duration, clients' expectations may also be influenced by how effective they perceive the treatment to be. In previous studies it is unclear whether the resulting expectations of treatment duration are representative of a perceived 100% effective treatment (100% of clients recover) or a treatment that is less impressive. The dose-effect literature, however, indicates that treatment effectiveness, in

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terms of likelihood of recovery, does depend on treatment duration (Howard et al., 1986). It follows that information on the percentage chance of recovery may alter expectations for treatment duration.  For example, a client may expect to attend 3 sessions for a treatment that is 50% effective (50% of clients recovery after 3 sessions) and 6 sessions for a treatment that is 100% effective (100% of clients recovery after 6 sessions).  To date no studies have been conducted examining length of treatment expectations in view of expectations concerning treatment effectiveness (chance of recovery).

A delay discounting model may be one way to examine length of treatment expectations in view of expectations concerning treatment effectiveness.  Delay discounting refers to an individual's preference between two rewards: a smaller immediate reward or a larger delayed reward.  In a delay discounting model, a larger delayed reward may be subjectively appraised as less valuable than a smaller immediate reward due to the passage of time (Wileyto, Audrain-McGovern, Epstein, & Lerman, 2004).

While delay discounting procedures have long been used in the field of economics to improve marketing strategies and in the field of cognitive psychology as a measure of impulsivity, in recent years researchers in the medical field have begun to use these procedures to examine decision making concerning health and treatment options.  In the medical field, delay discounting procedures have been used to examine both preventative behaviors that require an upfront cost to achieve a long term benefit and destructive behaviors that produce an upfront reward at a long term cost (e.g., Chapman, Brewer, Coups, Brownlee, Leventhal, and Leventhal, 2001; Heil, Johnson, Higgins, Bickel, 2006; Ohmur, Takahashi, Kitamura, 2005; Ortendahl, Fries, 2005).  Researchers in the medical

field have also used delay discounting to examine patient preferences and decision making with regard to treatment options (e.g., Chapman, Nelson, & Hier, 1999; Hayman, Weeks, Mauch, 1996).

Delay discounting procedures may also have application in the mental health field in examining client preferences and decision making with regard to psychological treatment options. Using this model, clients can compare two treatments that may differ in effectiveness (in terms of rate of recovery) across differing amounts of time (number of requisite sessions of therapy). By systematically manipulating the effectiveness of two hypothetical treatments, values can be found that represent how large of an increase in effectiveness is needed in order for a potential client to prefer to continue treatment for 1, 2, 3, etc… sessions. This method may also be used to place values of expected effectiveness (chance of recovery) for different durations of treatment.

The proposed study will examine the issue of expectations for treatment duration in relation to expectations for treatment effectiveness by using a delay discounting paradigm. The observed expectations in this study will also be compared to actual treatment recovery rates. Discrepancies between expected duration/effectiveness and actual duration/effectiveness will then be used to provide one possible explanation for premature termination from psychotherapy.

CHAPTER II

REVIEW OF LITERATURE

*Dose-Effect Model*

Many models have been developed in an effort to describe the progress that clients make over time in psychotherapy (e.g., Bandura, 1977; DiClemente and Prochaska, 1982; Rogers, 1958). One such model is the dose-effect model, which states that with increasing doses of psychotherapy a greater proportion of patients are likely to show improvements or gains. Although evident in earlier research (Jacobs & Warner, 1981; Jones, 1980; Mensh & Golden, 1951; Strassberg, Anchor, Cunningham, & Elkins, 1977), this model was first introduced by Howard, Kopta, Krause, and Orlinsky (1986).

In their 1986 meta-analysis, Howard et al. were interested in examining the dose-effect relationship for psychotherapy. Using drug studies as an example, in which weight in milligrams is the unit that defines a dose of treatment, Howard et al. used the session as the unit that defines a dose of treatment in psychotherapy. They believed that the session was the best selection as a unit of treatment because it is easily quantifiable and roughly comparable across types of treatment and it was hypothesized that clients receiving one session of therapy would be exposed to roughly the same amount of active ingredients regardless of what psychotherapy orientation was being used. Also drawing on drug studies for the concept of effect, Howard et al. defined the effect of psychotherapy as the percentage of patients classified as improved. Accordingly, in this original meta-analysis Howard et al. were interested in examining the relationship

between the number of sessions of individual psychotherapy received and the percentage of clients who improved.

Howard et al. (1986) conducted their meta-analysis using data for over 2,400 clients included in 15 different studies. These studies varied in client demographics, therapists, therapeutic orientations, treatment settings, and outcome criteria. The clients in these samples were largely adults, including a greater percentage of females than males, from diverse social classes. These clients were generally diagnosed with depression or anxiety disorders with relatively small proportions diagnosed with personality or psychotic disorders. The therapists in these samples represented each of the major mental health professions and described themselves as mainly psychodynamic or interpersonal in orientation. Treatment settings included university counseling centers and clinics, community clinics, and private practice. Treatment outcome was largely determined by therapist rating; however, some of the studies used client or researcher ratings. Clients in these studies were usually seen on a weekly basis and outcome was rated after the termination of treatment.

Howard et al. (1986) examined the dosage effects by using probit analysis to combine the data from the samples in three areas: (1) the session at which improvement was assessed, (2) the number of clients assessed at each point in treatment, and (3) the number of clients judged improved at each point. This probit analysis resulted in estimates of the proportion of clients improved at each session or dose of treatment. The findings indicated that 10% to 18% of clients improved prior to the first session of psychotherapy. Howard et al. explained this improvement as a function of the initial contact resulting in the patients realizing that they will receive help soon. At eight

sessions 48% to 58% of clients were considered improved.  About 75% of clients were considered improved at six months of treatment (26 sessions) and about 85% of clients were considered improved at one year of treatment (52 sessions).

After an overall analysis of the data, Howard et al. (1986) examined the dose-effect relationship for three different diagnostic categories:  depression, anxiety, and borderline-psychotic.  This analysis found that clients in the depression category responded at a lower dosage of psychotherapy, those in the anxiety category at a slightly higher dosage, and the clients in the borderline-psychotic category at an even higher dosage.  In the depression and anxiety category, 50% of the clients were rated improved at about 8 to 13 sessions of treatment, while 50% of the clients in the borderline-psychotic category were not rated improved until 13 to 26 sessions (according to the self rating), or 26 to 52 sessions (according to the researcher ratings).

Howard et al. (1986) were able to draw a number of implications from the results of their meta-analysis.  One implication is the positive relationship and the shape of the curve when plotting the percentage of patients improved for each dose of psychotherapy. This curve was negatively accelerated, indicating that with a greater number of sessions there is a greater likelihood of improvement; however, diminishing returns can be expected as the dosage increases.  Another implication of Howard et al.'s findings is that clients who attend less than 6 to 8 sessions of treatment, the point at which 50% of clients show some improvement, may not have been effectively exposed to treatment. Howard et al. indicates that these clients should be considered pre-mature terminators and that in research their data should be analyzed separately.  A final implication made by Howard

et al. is the use of a 26-session time limit, the point at which 75% of clients have shown

some improvement, to indicate cases that should be subject to review.

*Figure 1*. Howard et al. (1986) dose-effect relationship curve.
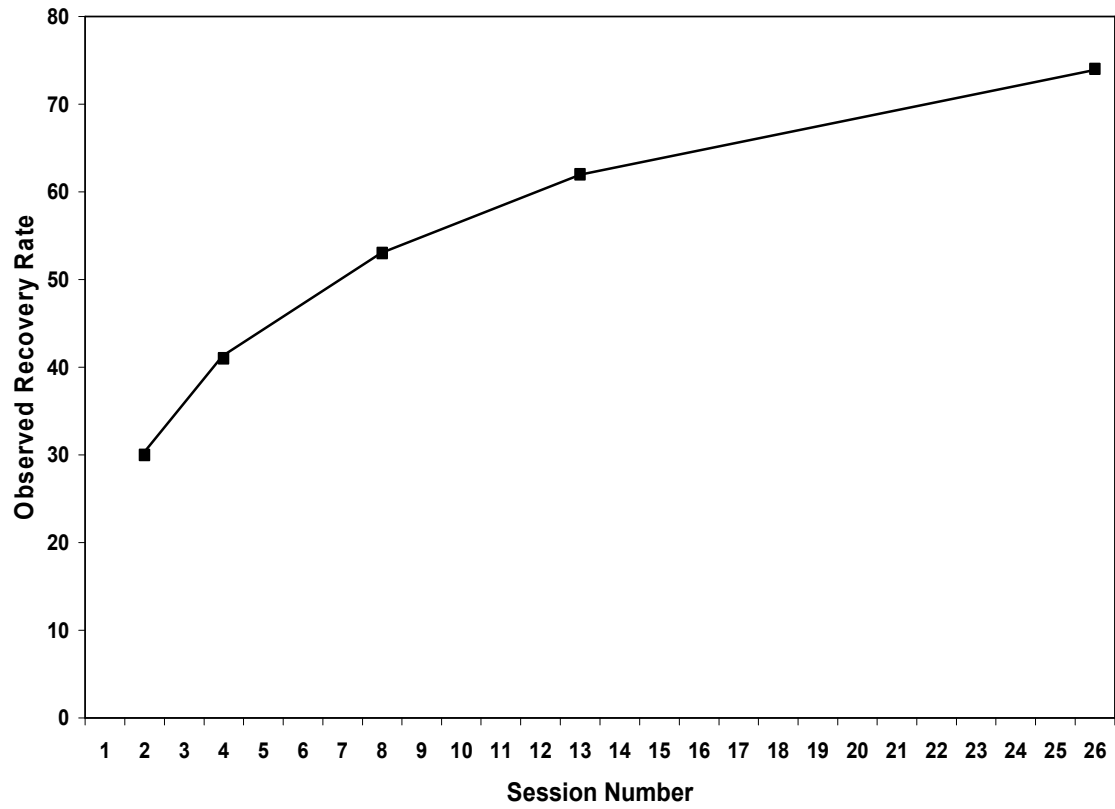
Although Howard et al.'s (1986) meta-analysis has many important implications for the dose-effect model of psychotherapy, several limitations with this study should be considered. These limitations include the use of subjective ratings of improvement instead of standardized outcome measures, using improvement to define effect instead of a more stringent criterion of recovery, using predominately psychodynamic and interpersonal treatments, and only measuring outcome before and after therapy which may miss the earliest point at which clients may see improvement. Despite limitations, Howard et al's meta-analysis made an important contribution by introducing the concept of the dose-effect relationship to psychotherapy (Kedra et al., 1996), and this initial investigation has sparked much excitement and further research studies seeking to replicate, further clarify, and improve the model.

In an effort to replicate the model while addressing some of the limitations in the seminal study, Kopta, Howard, Lowry, and Beutler (1994) tracked the dose-effect relationship over the course of therapy for 854 outpatients. In this study Kopta et al. used a standardized outcome measure, the Symptom Checklist-90-Revised (SCL-90-R; Derogatis, 1983), to track the outcome for clients. They also looked at symptom remission to a normal level using the Jacobson, Follette, and Revenstorf's (1984) definition of clinical significance.

Using probit analysis Kopta et al. (1994) again found a positive and negatively accelerated dose-effect relationship that was similar to Howard et al.'s (1986) previous findings. However, in this replication study Kopta et al. found that a larger dose was needed in order to find the same effects reported in the original. Kopta et al. reported that 50% of the clients were improved by the end of 11 sessions and 75% of the clients were

improved by the end of 58 session: This is compared to 50% of clients improved at 8

sessions and 75% of clients improved at 26 session as reported in the original model.

Kopta et al. explained that the difference may be due to the fact that Howard et al.

investigated general improvement that did not require a return to normal functioning and

Kopta et al. believed that the data used in their slower model better represents the dosage

that is necessary for symptoms to remit to normal levels.

Although Kopta et al. (1994) did not look at the relationship between diagnostic

category and different remission rates as did the Howard et al. meta-analysis, they did

examine the difference between acute, chronic, and characterological symptoms.

Looking at the remission rates for different symptoms as measured by the SCL-90, they

were able to group symptoms into one of the above three categories.  Interestingly,

symptoms that belong to the same diagnostic category responded to treatment at different

rates.  For example, of the symptoms associated with depression, some responded to

treatment quickly (50% of clients showed a remission in under 10 sessions), some

symptoms showed a slightly slower response rate (50% of clients showed a remission at

around 14 sessions), and some depressive symptoms showed an extremely slow response

rate (less than 50% of clients showed a remission of these symptoms by 52 sessions).

Additional studies have been conducted looking at the issue as to whether or not

different dose-effect relationships exist for different diagnostic categories and different

symptoms.  Lueger, Lutz, and Howard (2000) tested the dose-effect model for clients

using four diagnostic groups (mood, anxiety, other, and no diagnosis).  They analyzed

data from client and clinician ratings for 120 clients seen in an outpatient setting.  Lueger

et al. found that clients in the anxiety category showed the largest improvements after 30

sessions (1.4 standard deviation units of improvement), followed closely by those in the mood category (1.2 standard deviations of improvement), with those in the other category (.75 standard deviations of improvement) and no diagnosis category (.55 standard deviations of improvement) showing the smallest amounts of improvement after 30 sessions. These results replicate Howard et al.'s (1986) findings indicating that different diagnostic categories have different rates of improvement; however, Lueger et al.'s results indicate that response to treatment for clients with mood or anxiety disorders may be much slower than what Howard et al. had originally found.

On the other hand, Barkham, Rees, Shapiro, Hardy, Stiles, and Reynolds (1996) tested the dose-effect model for acute, chronic, and characterological symptoms and found that clients recover from some symptoms faster than they do to others, similar to Kopta et al.'s (1994) findings. In this study Barkham et al. examined the psychotherapy outcomes of 212 outpatient clients diagnosed with depression. This study used a different methodology from the previous does-effect studies by randomly assigning clients to either eight session or a 16 session treatments. Barkham et al. did find that a larger proportion of clients had made clinically significant improvements by the end of the 16-session treatments (46% of clients) than by the end of the 8 session treatments (30% of clients), indicating a dose-effect relationship in this sample. Further, the effect of the 8 session treatment was more than half as large as the effect of the 16 session treatment, suggesting, as was found in the previous studies (Howard et al., 1986; and Kopta et al., 1994), diminishing returns from larger doses.

Recognizing the difference that was found in the dose-effect model between the Kopta et al. (1994) study and the original Howard et al. (1986) meta-analysis, and finding

limitations in both studies, Kadera, Lambert, and Andrews (1996) conducted a test of the model. Specifically, Kadera et al. wanted to test the accuracy of these previous estimates of the dose-effect relationship in a session-by-session analysis. Kadera et al. believed that a session-by-session analysis as compared to a pre- and post-treatment analysis would provide a more complete picture of a client's actual progress and would indicate the earliest point at which the improvement was made instead of having to extrapolate and possibly misrepresent when a client actually improves.

In this study Kadera et al. (1996) tracked the progress of 64 clients seen in a university-based outpatient clinic. In order to track client progress, the newly developed Outcome Questionnaire (OQ-45; Lambert et al., 1994) was used. This outcome measure was designed to measure the symptom distress, social-role functioning, and interpersonal relationships of clients, and was sensitive enough to detect week by week changes. Kadera et al. examined the client's outcome using Jacobson and Truax's (1991) definition of clinically significant improvement and reliable change as measured by the OQ-45 at each dose of psychotherapy.

Kadera et al. (1996) used survival analysis to analyze the data in two ways: by looking at only clients who ultimately did recover by the end of the 26 week study, and by looking at all clients regardless as to whether or not they recovered by the end of the study. For the 21 clients who made a clinically significant and a reliable change, 14% recovered by session 4, 43% recovered by session 8, and 76% recovered by session 13. Kadera et al. indicated that these results could be used to compare the progress of an individual client to where they should be if they were to ultimately recover by the end of 26 sessions. However, Kadera et al. felt that these results were not comparable to

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Howard et al.'s (1986) results because only recovered clients were used, whereas Howard et al. assumes a hypothetical population of patients remaining in therapy until improved. As a result, the data was analyzed with all clients, regardless of recovery, to represent the percentage of patients expected to be recovered at each session or dose of psychotherapy. Kadera et al. found that 22% of clients are expected to be recovered at 8 sessions, 50% were expected to be recovered at 16 sessions, and about 75% of clients are expected to be recovered at 26 sessions.

Kadera et al. (1996) reported three reasons why their sample's recovery rates were lower than those seen in the original Howard et al. (1986) analysis. First, only patients who were classified as dysfunctional at the start of the study were included in their analysis; whereas Howard et al. included a mixture of functional and dysfunctional clients. Kadera et al. believed that an inclusion of functional clients would indicate earlier initial responses to therapy. A second reason for the difference between the Kadera et al.'s and the Howard et al.'s calculations of the dose-effect model were the difference in the measurements of outcome. Whereas Howard et al. used subjective ratings; Kadera et al. used a standardized measurement. This issue was also addressed in the Kopta et al. (1994) study. The third reason Kadera et al. reported lower recovery rates is because their dose-effect figures were calculated from data assessed session-by-session rather than mathematical extrapolations across sessions (survival analysis as compared to probit analysis). They indicate that when their data is reanalyzed using probit analysis it results in an underestimation of the actual session needs by two doses.

After the publication of Kadera et al.'s (1996) study, many researchers examining the dose-effect relationship began utilizing the session-by-session analysis, thus avoiding

many of the problems and the uncertainty associated with pre- post- outcomes and probit

analysis. Using this session-by-session tracking of client progress, Lambert, Okiishi,

Finch, and Johnson (1998) analyzed data from 27 clients seen by a single therapist

specializing in brief therapy. Using clinically significant and reliable change criteria for

the OQ-45, Lambert et al. found a much steeper dose-effect curve than that seen in the

Kadera et al. sample. In this sample 36% of clients were recovered after two sessions and

46% of the clients were recovered after 7 sessions. Lambert et al. believed that the faster

recovery rate may be due to the fact that the clients in their sample were seen by an

experienced therapist whereas the clients in Kadera's study were seen by student

therapists. Another difference between these studies is the shape of the curve associated

with the dose-effect relationship. Although more dramatic, the curve found in Lambert et

al.'s study is more similar to the curve seen in previous studies (Barkham et al., 1996;

Howard et al., 1986; Kopta et al., 1994) showing a positive relationship between dose and

effect that is negatively accelerated. The curve found by Kadera et al. also shows a

positive relationship; however, with their curve little negative acceleration exists,

indicating that clients are not as likely to make improvements during the first few

sessions or doses of therapy. As with the different speeds in recovery rates, Lambert et

al. attribute the dissimilar curves to be due to the differences between the student

therapists and the professional therapist.

Draper, Jennings, Baron, Erdur, and Shankar (2002) also used a session-by-

session analysis to examine the dose-effect relationship in psychotherapy. Indicating that

Kadera et al.'s (1996) study and other recent dose-effect studies were performed with a

small number of participants, Draper et al. desired to use a large nationwide sample for

their analysis.  Their study looked at outcome data for 1,698 clients receiving services from counseling centers at 42 different universities as a part of the Research Consortium of Counseling and Psychological Services in Higher Education.  Consistent with the Kadera et al. and the Lambert et al. (1998) studies, Draper et al. used the OQ-45 to measure clients' session-by-session progress.  Similar to the previous dose-effect studies, results from this sample also indicate a negatively accelerated curve with clients demonstrating rapid improvements at earlier doses with the amount of improvement per session tapering off at the larger doses.  In this sample the point at which 50% of the clients were considered recovered was after 6 sessions of psychotherapy, similar to the results found by Lambert et al.

Draper et al. (2002) also included an analysis of the data after separating clients into groups according to their termination session.  Out of clients who terminated after 1 session of therapy, 13.4% were measured to be recovered; whereas out of clients terminating after 5 sessions of therapy, 22.1% were measured to be recovered, and after 10 sessions of therapy, 39.4% were measured to be recovered.  These results indicate that those who remain in therapy for ten sessions were more likely to recover than those who drop out after five sessions or one session.  Examining each client's session-by-session data, Draper et al. were also able to conclude that in general, the more sessions a individual client has before termination, the larger the improvement for that client.

Similar to the Draper et al. (2002) study, Hansen and Lambert (2003) collected session-by-session outcome data for 4,761 clients receiving psychotherapy.  Hansen and Lambert wanted to look at data from patients seen at a variety of treatment settings where licensed professionals are employed rather than only looking at data from patients in a

university or training clinic setting, a limitation seen in previous studies (Draper et al., 2002; Kadera et al., 1996). They analyzed data taken from patients seen through an employee assistance program (N = 3,269), a local HMO (N = 595), a national HMO (N = 536), and a state community mental health center (N = 361). Hansen and Lambert found that 50% of the clients were recovered after 16 sessions and 50% of clients were improved after only 8.5 sessions. They also found a recovery curve that shows a rapid initial response to treatment followed by a slower rate of response at larger doses of therapy. They indicate that their results and the aggregate recovery curve are similar to previous studies looking at the dose effect model (Kendra et al, 1996) and when relaxed to include patients who recover or improve reliably (or both) are nearly identical to Howard and colleagues' findings (Howard et al., 1986; Kopta et al., 1994).

More recently, Callahan and Hynan (2005) used a session-by-session analysis to test the dose-effect model in a training clinic setting. Callahan and Hynan examined data from 61 clients treated by 21 trainee clinicians. Using the OQ-45.2 (Lambert et al., 1996) for the outcome measure, 8% of clients were categorized as improved after 8 sessions, 31% of clients were categorized as improved after 26 sessions, and 38% were categorized as improved after 52 sessions. These findings show a lag in response to psychotherapy when compared to previous dose-effect studies, which Callahan and Hynan indicate may be a result of clinician differences in effectiveness. Interestingly, in contrast to Howard et al.'s (1986) findings, this sample did not find a relationship between diagnosis and improvement rate.

In attempting to summarize the results from the previous published literature on the dose-effect relationship, Hansen, Lambert, and Forman (2002) examined the data

from seven studies dating back to the original Howard et al. (1986) meta-analysis. In these studies a range of 5 to 104 sessions was required to reach a 50% patient improvement rate. Hansen et al. believed that this large range could be a result of measurements on different symptoms, using different methods to measure outcome (pre-post- test compared to session-by-session), and using different methods to analyze the data (probit analysis compared to survival analysis compared to observed percentages). When taking these differences into account, Hansen et al. concluded that there is a general consensus that between 13 and 18 sessions of therapy are required for 50% of patients to improve. Hansen et al. also concluded that patients who continue in treatment after the median number of sessions continue to show improvement, indicating that more treatment results in greater patient response.

Although a large body of literature supports the dose effect model, a few studies have found conflicting results. Dekker, Molenaar, Kool, VanAalst, Peen, and deJonghe (2005) examined the dose-effect relations of psychotherapy for 90 patients seen in an outpatient clinic. Patients in this study were randomly assigned to either an 8-session or 16-session treatment. All patients in this study were seeking treatment for depression and received psychotherapy in combination with pharmacotherapy (only psychotherapy differed in treatment length between the two groups). Dekker et al. measured client progress at weeks 4, 8, 12, 16, and 24. Using survival analysis Dekker et al. found different recovery curves and rates for the two treatment groups. The 8-session treatment group made more rapid improvements over the first eight sessions. At session 8 the 8-session treatment group had a larger proportion of participants remitted than did the 16-session treatment group. However, after the eighth session the proportion of participants

remitted in the 8-session group remained relatively static while the proportion of participants remitted in the 16-session group continued to increase. At session 16 and 24 no difference was seen between the two groups.

Dekker et al. (2005) concluded that their findings do not support the dose-effect model and that a brief or shorter session psychotherapy treatment may be preferable to a lengthier treatment. The shorter session treatment group showed faster remission rates after fewer sessions and in the long run (after completion of both treatments) showed no difference in comparison to a treatment group that received twice as many sessions. Dekker et al. believed that the acceleration of therapeutic change that was seen in the fewer sessions group may be a result of placing a limit on the clients and encouraging them to make the same amount of improvement in a shorter amount of time.

A number of limitations may have played a role in Dekker et al.'s (2005) failure to find a dose-effect relationship. Dekker et al. only used clients diagnosed with depression, whereas previous literature has examined the dose-effect model in clients seeking treatment for varying problems. Howard et al. (1986) did find that clients seeking treatment for mood disorders may show a different response to treatment than other clients. Another limitation of Dekker et al.'s study was the use of a fixed treatment length, whereas most of the previous studies look at therapy as it naturally occurs. A fixed treatment length may not show the complete picture of improvement that may be seen if clients are allowed to continue in treatment until they are ready to finish; perhaps those in the 8-session group made quicker improvements, but if they would have continued in therapy they would have made even more improvements. Another limitation of the Dekker et al. study was the difference between the treatments given to

the two groups.  It appears that both groups received the same manualized treatment,

except that those clients in the 16 session group received it at a slower rate.  If the 16

session group had received the treatment at the same rate for the first 8 sessions and then

further treatment for the next 8 sessions, they would possibly show greater gains.

More recent than the Dekker et al. (2005) study, Barkham et al. (2006) also found

results that seem to contradict the dose-effect model.  This study examined the course of

therapy for 1,868 clients who were seen in an outpatient setting.  Barkham et al. were

interested in the rates of improvement for psychotherapy treatment as a function of the

number of sessions attended by the client.  It was found that when separating clients into

groups according to when treatment is terminated, recovery rates tend to be similar across

ending sessions and are not significantly correlated with the session number.  Barkham et

al. believed that the negatively accelerated curve that was observed in previous studies is

a result of aggregating the data in a way that does not represent the individual client.

They suggest that in the dose-effect model session 10 shows less effect than session two

because the easy to treat clients have already responded by the tenth session and only the

hard to treat clients remain at that point.  Barkham et al. consider a Good Enough Level

(GEL) model, which suggests that treatment ends when acceptable improvement is

achieved for the individual client, to better describe the course of psychotherapy.

This interesting suggestion is not without flaws.  When Barkham et al. (2006)

analyzed the data used to construct the GEL model they only used data from clients who

left treatment with a planned ending as compared to including clients who left the

treatment unexpectedly.  Barkham et al. also only used pre- post- outcome scores in their

analysis, which may not accurately represent the true session at which a client recovers.

Another flaw with the GEL model is that it is difficult to use to predict progress through therapy, since it only tells the likelihood of recovery at the session when the client terminates therapy and the terminating session is not always known at the start of therapy. Further the GEL model is an interesting, but novel way to examine the effects of psychotherapy and it does not yet have the support of a large body of research as does the dose-effect model.

*Premature Termination and Unmet Expectations*

Hansen et al.'s (2002) review, previously referenced, included an analysis on the course of therapy for over 6,000 clients seen at a number of sites across the nation. First, they indicated that this sample was originally composed of over 9,100 clients; however, 3,101 clients (33%) had to be excluded from the sample because they terminated after only one session of therapy. Of the remaining 6,072 clients the average number of sessions of therapy was 5, with a median of 3 sessions. They also found that in their sample only about 20% of patients showed improvement. These findings are somewhat surprising given that the seminal dose effect model (Howard et al., 1986) and the dose effect literature (Hansen et al., 2002) indicate that between 13 and 18 sessions are needed for 50% of clients to show improvement. Based on this data, Hansen et al. concluded that clients, on average, do not get adequate exposure to psychotherapy to produce positive outcomes.

*Defining Premature Termination*

The literature refers to clients who do not get adequate exposure to psychotherapy by many different terms: premature terminators, drop-outs, early terminators, unilateral terminators, etc. While these terms are often used interchangeably in the literature,

important definitional distinctions should be made. A large number of studies define drop-out and completers in terms of the number of treatment sessions. Using number of sessions as a criterion, studies have classified drop-outs as clients who have attended fewer sessions than expected by the therapists, fewer sessions than expected by the researchers, fewer sessions than expected by the literature, and fewer sessions than the average. However, Weirzbicki and Pekarik (1993) have argued that because clients progress at different rates in therapy, both treatment completion and treatment drop-out can occur after any number of sessions. The dose-effect literature, which provides evidence that some clients make reliable and clinically significant changes after only one or two sessions while other clients do not make these changes after more than a year (Hansen et al., 2002), also supports the argument that defining dropout merely by the number of sessions attended is problematic.

A second way to define drop-out is through therapist's ratings. Using this definition, a client terminates therapy prematurely when the client discontinues therapy against the therapist's advice or judgment. Although therapists may be able to provide valuable clinical judgment with regard to their clients, this definition may also be problematic. Many of the studies examining client drop-out use student therapists who may feel some pressure concerning evaluation and thus may under report the actual failure or drop-out of clients. Even without such pressures, therapist's judgment may not always be accurate. Todd, Deane, and Bragdon (2003), who asked both therapist and clients for their reasons for termination, found that therapists were more likely than clients to endorse "improvement" or success as the reason for termination. Hannan et al. (2005), who asked therapists to predict their clients' progress, found that therapists

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subjectively tend to over predict improvement and fail to recognize clients who worsen in comparison to clients' empirical OQ-45 ratings.

Researchers have also used a number of other methods to define client drop-out. These methods include failure to attend the next scheduled appointment, failure to inform the therapist of termination, determination by independent raters after examining case notes, failure to reach the treatment goals as set by the client and therapist, and more. Unfortunately, each of these definitions for therapy drop-out or premature termination is also associated with various problems.

One promising method that may be used to define premature termination is to use the criterion of statistically reliable and clinically significant change. Using this method, clients that terminate therapy before they have attained reliable and clinically significant change are classified as drop-outs or premature terminators. In contrast, clients that terminate therapy after demonstrating reliable, clinically significant change are considered completers. Using the OQ-45, Hannan et al. (2005) reported that this method correctly identified the outcome of 100% of the clients, 86% of which could be correctly predicted by the third treatment session. As of yet, however, relatively few studies examining premature termination have used such an empirical method. Given that premature termination or drop-out can be defined in a number of different ways, a recognized problem with the literature in this area is the lack of consensus on the use of and the definition of these terms. In the following section the terms used to refer to premature termination or treatment drop-out will be accurate as to the terms used by the authors in their articles.

*Variables Related to Premature Termination*

Despite problems associated with defining drop-out or premature termination, many studies indicate that a large number of clients terminate therapy before they have seen any real benefits. For example, Wierzbicki and Pekarik (1993) conducted a meta-analysis of 125 studies examining psychotherapy drop-out. Across the studies included in the analysis, the mean drop-out rate was 46.86% with a 95% confidence interval of 42.9% to 50.82%. Examining effect sizes, analyses of variance further revealed that drop-out was not significantly related to the variables of treatment type, treatment setting, client age, client gender, or client marital status. However, analysis of variance did indicate that drop-out was related to the variables of racial status, education, and socioeconomic status; specifically, an increased risk for drop-out was associated with minority racial status, low level of education, and low SES. However, Wierzbicki and Pekarik concluded, based on the computed mean effect sizes, that these (race, $M = .23$; education, $M = .28$; and SES, $M = .37$) and other demographic variables (sex, $M = -.09$; age, $M = .10$; and marital status, $M = -.11$) were only "modestly related" and "researchers would better spend their time investigating other variables" such as clients' intentions and expectations (pg. 194). Unfortunately, in this meta-analysis Wierzbicki and Pekarik compared studies that defined drop-out using different criteria.

In also addressing this topic of premature termination, Garfield (1994) provided a review of the literature concerning clients who refuse therapy following initial contact (fail to return after the first appointment) and clients who begin psychotherapy but terminate their participation or drop-out prematurely. Citing studies that date back to the 1970s, Garfield reports that between 23% and 49% of clients fail to return after the initial intake session. When considering treatment duration, Garfield reports that the median

number of sessions that clients attend is between 5 and 8 and that by the tenth session over 60% of clients have discontinued treatment.

In further reviewing the literature Garfield (1994) indicates that a number of variables may play a role in why many clients discontinue therapy before effects can be expected. Demographic variables such as social status, level of education, age, race, and gender have all been suggested as being related to premature termination. However, Garfield reports that studies examining these variables have often found contradictory results. Others have suggested that diagnosis, specifically personality disorders or psychosis, may be related to premature termination. However, in this area Garfield also concludes that the results are inconclusive and that specific syndromes or disorders do not appear to be significant correlates. On the other hand, Garfield reports that the literature does indicate that clients' expectancies concerning therapy may play a role in early termination. He concludes, "Clients may have various expectations about psychotherapy and if these are incongruent with what actually occurs, the client could become dissatisfied and withdraw from therapy" (pg. 201).

Clarkin and Levy (2004) conducted a similar, but more recent review of the literature concerning client variables and premature termination. Clarkin and Levy concluded that while age and other demographic variables are not associated with early drop-out, social status and race may be related, indicating higher drop-out rates (40 to 60%) for low income minority populations. Clarkin and Levy also cited research that indicates clients diagnosed with a personality disorder, specifically borderline personality disorder, are at a high risk for premature drop-out (showing a 42 to 67% drop-out rate). Level of client psychopathology and a negative initial impression of the therapist by the

client were other factors found to predicted early drop-out from therapy. Similar to Garfield (1994), Clarkin and Levy also concluded that client expectancies show a strong relationship to premature termination and overall treatment duration.

*Client's Reasons for Termination*

When examining the literature comparing premature termination and unmet expectations it is important to distinguish between two types of expectancies: role expectancies and outcome expectancies (Dew & Bickman, 2005). Role expectancies refer to the behaviors that a client expects in the therapy situation. These role expectations may include clients' expectations of their level of involvement, expectations of the method of treatment, expectations of the therapist's characteristics, expectations of the use of homework, and more. A large body of literature indicates that disconfirmation of these role expectancies is related to premature termination (e.g., Hardin, Subich, & Holvey, 1988; Nock & Kazdin, 2001; Reis & Brown, 1999; Walitzer, Dermen, & Connors, 1999). Further, research also indicates that role induction or training prior to treatment decreases the rate of drop-out among clients (e.g., Orlinsky, Grawe, & Parks, 1994; Reis & Brown, 2006; Scamardo, Bobele, Biever, 1999; Walitzer, Dermen, & Connors, 1999; Zwick & Attkisson, 1985).

More pertinent to this study, outcome expectancies refer to a client's expectations concerning the effectiveness of psychotherapy. These outcome expectancies may include clients' expectations of the likelihood of improvement, expectations of the level of symptom reduction, expectations of the length of therapy, and expectations of the length of time needed before improvement is seen. A number of studies have examined the

relationship between disconfirmation of outcome expectancies and premature termination.

In an early study examining this relationship, Pekarik (1983) asked 46 clients who were seen in an outpatient clinic and terminated therapy prematurely (client was rated by their therapist as "in need of continued treatment beyond his last session") their reasons for termination. Pekarik found that of these premature terminating clients 39% terminated because they felt they no longer needed the services, 35% terminated due to environmental restraints, and 26% terminated due to dissatisfaction. Further, Pekarik examined pre- and post- outcome data using the Brief Symptom Inventory (BSI; Derogatis, 1975), a 53-item shortened version of the SCL-90, for these early terminating clients. The clients who reported no longer needing services or environmental constraints as the reason for termination did show a significant improvement in symptom reduction from intake to termination. However, those clients who reported dissatisfaction with treatment as the reason for termination did not show improvement in symptom reduction from intake to termination. These results indicate that some clients may drop-out of therapy because they do not see the improvements that they expect.

Acosta (1980) also looked at the relationship between early drop-out and disconfirmed outcome expectations by asking 74 premature terminating clients to rate possible reasons for termination. In this study premature termination was defined by leaving therapy without informing the therapist or failing to return to therapy without the therapist's consent or advice. Acosta was specifically interested in seeing if there were differences in reasons given by Mexican American, African American, and Anglo American clients. Interestingly, Acosta found no difference in the reasons given by these

groups.  In this sample the dominant reason given for terminating early was perception that the therapy was not beneficial.  These findings further indicate that some clients may drop-out of therapy because their expectations about its effectiveness are not being met.

Although Pekarik's (1983) and Acusta's (1980) studies help clarify the relationship between early drop-out and disconfirmation of outcome expectancies, they are not without limitations.  One criticism of these early studies is that they did not include a control or successfully treated group of clients.  Without a control group for comparison it is difficult to say whether reasons for termination are different for those who drop-out of therapy early.

In an effort to remedy this limitation, Hansen, Hoogduin, Schaap, and deHann (1992) compared 15 clients who dropped out of therapy early and 15 clients who were successfully treated to rate their reason for termination.  Hansen et al defined drop-out as: "the patient did not achieve the goals set, and ended the treatment without discussion, within ten treatment sessions".  In this study clients were asked to rate 31 statements as to how applicable it was in their decision to terminate.  These statements grouped under the following subject:  the results of therapy, expectations not being met, disappointing first meeting, problems with homework assignments, problems with the therapist, family constraints, and other environmental circumstances.  Hansen et al. found that the premature terminating clients indicated three times more often that therapy had not met with their expectations.  It was also found that those who dropped out of therapy early were less satisfied with the results.  The highest discrepancy between the two groups was on ratings for the statement "too little was achieved" in therapy.  All other reasons for

termination were rated similarly by those clients who terminated therapy prematurely and those who did not.

More recently, Garcia and Weisz (2002) compared the reasons for ending treatment given by parents of 344 youth seen for outpatient treatment in 10 different clinics. Of these 344 youth, 135 cases (39%) were classified as drop-outs (clients who terminated therapy against the therapist's advice). Garcia and Weisz asked both therapy drop-out and therapy completers to rate the applicability of 41 possible reasons for termination. Factor analysis on these 41 items yielded 6 factors, including: Therapeutic Relationship Problems, Family and Clinic Practical Problems, Staff and Appointment Problems, Time and Effort Concerns, Treatment Not Needed, and Money Issues. Of these factors, Therapeutic Relationship Problems accounted for 16% of the variance in ratings. When using t-tests to compare the two groups, drop-outs to completers, on these six factors, only the Therapeutic Relationship Problems and the Money Issues factors resulted in significant differences. When further comparing the two groups on the individual items that comprised the Therapeutic Relationship Problems factor, Garcia and Weisz found differences in 7 of the 15 possible reasons for termination. On all seven of these items clients who dropped out of therapy reported greater dissatisfaction than did clients who completed therapy. Of these seven items, six indicate dissatisfaction with the results of therapy (unmet outcome expectations) as compared to dissatisfaction with the therapy process (unmet role expectations).

*Expectations of Treatment Length and Effectiveness*

Attempts have been made to measure the actual expectations of treatment length for psychotherapy. Pekarik and colleagues, in particular, have conducted a number of

research studies examining the client's expected treatment duration in comparison to the clinician's expected treatment duration and the number of attended sessions of treatment. In one of the first such studies, Pekarik and Wierzbicki (1986) studied the relationship between these variables in 148 outpatient clients. Prior to treatment clients were asked "How many visits do you think you'll attend?", given the options of 1-2, 3-5, 6-10, 11-15, 16-20, 21-25, 26+, as well as "what type of therapy do you prefer?" given the options of a relatively brief treatment and a considerably longer treatment. Of these clients 20.3% expected to attend 1-2 sessions, 28.4% expected to attend 3-5 sessions, and 24.3% expected to attend 6-10 sessions of treatment. These results indicate that a total of 73% of the clients expected to attend 10 or fewer sessions of treatment.

Pekarik and Wierzbicki (1986) also asked the clinicians of these 148 clients to indicate their preferences concerning length of treatment. When using chi-square analysis to compare client and therapist preferences between a treatment lasting 1-15 sessions and a treatment lasting 16+ sessions, these researchers found that the proportion of clients expecting short-term treatment (129 of 148) was significantly greater than the proportion of therapists (7 of 20) preferring the short-term treatment ($\chi^2$ (1) = 3.91, $p <$ .001). Pekarik and Wiersbicki also examined the relationship between the expected number of sessions and the actual number of sessions attended in this sample. It was found that these two variables did correlate significantly ($r = .28$, $p < .01$) Further, a stepwise-regression analysis indicated that the client's expected number of visits was the only variable to significantly incrementally increase the predictability of the actual number of sessions attended.

In a similar study Pekarik (1991) asked 68 adult outpatient clients and 63 parents

of child outpatient clients to indicate "How many visits do you think you will attend here at the clinic?", given the same duration options provided in Pekarik and Wierzbicki's (1986) study. In this sample 11% of the clients expected to attend 1-2 sessions, 30% of the clients expected to attend 3-5 sessions, and 33% of the clients expected to attend 6-10 sessions. Similar to Pekarik and Wierzbicki findings, 74% of the clients in this sample expected to attend 10 or fewer sessions of treatment. In this study Pekarik also examined the relationship between the expected number of sessions and the actual number of attended sessions. For adults, anticipated number of visits and client age were the only variables significantly related to the actual attended number of sessions attended (client demographic characteristics and number of symptoms on the BSI were not significantly related). Anticipated visits, the stronger related of the 2 variables produced an $R^2$ equal to 0.14, $F(1, 61) = 10.00$, $p < .005$., and a Pearson's product-moment correlation of $r = 0.38$, $p < .001$. Using multiple regression analysis for child clients, anticipated visits, as well as all other variables, was not a significant predictor of treatment duration. Pekarik explained these mixed findings postulating that individual characteristics (such as motivation, goals, amount of distress, and confidence in treatment) "are most likely to be related to treatment duration when an individual has both the power to influence treatment duration directly and is him- or herself the object of treatment—this is true of adults but not children" (pg. 124).

In a more recent study, Mueller and Pekarik (2000) asked 230 clients seeking treatment in 1 of 10 different private practice settings concerning their expectations for treatment durations. Using a slightly modified scale of estimated treatment duration (1-2, 3-5, 6-8, 9-12, 13-17,18-25, and 26+) these researchers also asked clients prior to

treatment of their expectancies. Within this private practice sample 3% of clients expected to attend 1-2 sessions, 15.8% of clients expected to attend 3-5 sessions, 25.% of clients expected to attend 6-8 sessions, and 26.8% of clients expected to attend 9-12 sessions. These results indicate that over 70% of the sample expected to attend 12 or fewer sessions of treatment. Mueller and Pekarik also asked the therapists assigned to the clients in this sample of their expected treatment duration. Using a chi-square analysis it was found that while 18.8% of clients expected treatment termination in 5 or fewer sessions, therapists expected only 9.4% to terminate in this amount of time ($\chi^2[1, N = 62]$ = 4.22, $p < .05$). Univariate analyses found that client's expected number of visits (r = 0.34, p < .01) as well as seven other variables (therapist's expected number of visits, education, client well-being, sexual abuse history, problems with food, history of an eating disorder, and therapist's degree) were significantly correlated to actual treatment duration. A stepwise-regression analysis further indicated that client's expected treatment length significantly increased predictability of the actual number of sessions attended and accounted for more variance than any of the other predicting variables. Although differing percentages for expected treatment length were found in this sample, possibly due to the private practice population or to the alteration of the scale assessing expected treatment length, this study adds to the literature that states that clients expect to attend a relatively few number of sessions of treatment.

These studies have all used the same method for assessing expected treatment duration; directly asking the clients to indicate the number of sessions they think they will attend. However, when considering treatment duration, clients' expectations may also be influenced by how effective they perceive the treatment to be. In these previous studies it

is unclear whether the resulting expectations of treatment duration are representative of a perceived 100% effective treatment (100% of the clients receiving the treatment recovered) or a treatment that is less impressive. The dose-effect literature indicates that treatment effectiveness (chance of recovery) does depend on treatment duration (Howard et al., 1986). Information on likelihood of recovery may alter expectations for treatment duration. For example, a client may expect to attend 3 sessions for a treatment that is 50% effective (50% of clients recover after 3 sessions) and 6 sessions for a treatment that is 100% effective (100% of clients recover after 6 sessions). To date no studies have been conducted examining length of treatment expectations in view of expectations concerning treatment effectiveness (chance of recovery).

*Delay Discounting Model*

A delay discounting model may be one way to examine length of treatment expectations in view of expectations concerning treatment effectiveness. Delay discounting refers to an individual's preference between two rewards: a smaller immediate reward or a larger delayed reward. In a delay discounting model, a larger delayed reward may be subjectively appraised as less valuable than a smaller immediate reward due to the passage of time (Wileyto, Audrain-McGovern, Epstein, & Lerman, 2004). For example, individuals may prefer $50 today (smaller immediate reward) as compared to $100 one year from now (larger delayed reward). The measurement of discounting typically involves finding the point at which subjects view the smaller immediate reward as equal to the larger delayed reward; often called the 'indifference point'. In the before mentioned example individuals may prefer the smaller immediate reward; however, if the larger delayed reward were increased to $150 one year from now,

individuals may not show a preference between the two rewards. An exact indifference point is found by systematically manipulating the value of the rewards until the individual no longer shows a preference for one over another. Two examples of finding an indifference point with money can be seen in Appendix A.

The obtained indifference point can be used to determine a participants discounting rate; the value of the reward compared to the value of the delay in time. This discounting rate takes the form of a hyperbolic function (Madden, Begotka, Raiff, & Kastern, 2003). Mazur (1987) proposed the following formula to quantify this hyperbolic function:

$$V = A/(1 + kD)$$

where $A$ is the amount of the award delivered after the delay, $D$ is the amount of delay, $k$ is the parameter that describes the discounting rate, and $V$ is the subjective value of the delayed reward. This hyperbolic function has been widely accepted and used since its proposal (Madden et al., 2003).

While delay discounting procedures have long been used in the field of economics, to improve marketing strategies, and the field of cognitive psychology, as a measure of impulsivity, in recent years researchers in the medical field have begun to use these procedures to examine decision making concerning health and treatment options. Researchers in the medical field have used delay discounting to examine both preventative behaviors that require an upfront cost to achieve a long term benefit, and destructive behaviors that produce an upfront reward at a long term cost (e.g., Chapman, Brewer, Coups, Brownlee, Leventhal, and Leventhal, 2001; Heil, Johnson, Higgins, Bickel, 2006; Ohmur, Takahashi, Kitamura, 2005; Ortendahl, Fries, 2005). Researchers

in the medical field have also used delay discounting to examine patient preferences and decision making with regard to treatment options (e.g., Chapman, Nelson, & Hier, 1999; Hayman, Weeks, Mauch, 1996).  An example of a delay discounting instrument used to examine decision making concerning treatment options can be seen in Appendix B.

Delay discounting procedures may also have application in the mental health field in examining client preferences and decision making with regard to psychological treatment options.  Using this model, clients can compare two treatments that may differ in effectiveness (in terms of rate of recovery) across differing amounts of time (number of requisite sessions of therapy).  By systematically manipulating the effectiveness of two hypothetical treatments, indifference points can be determined that represent preferences or expectations of treatment as a function of effectiveness across varying treatment lengths. An example of the delay discounting instrument that will be developed for use in this study to examine the expectations of treatment preferences across time can be seen in Appendix C.  Using the indifference points to calculate participant discount rates ($k$), values can be found that represent how large of an increase in effectiveness is needed in order for a participant to prefer to continue treatment for 1, 2, 3, etc… sessions and values of expected effectiveness (chance of recovery) can be placed for different durations of treatment.

*Hypotheses*

Given the literature, the following hypotheses are proposed:

1.  Using a delay discounting instrument comparing treatment duration to treatment effectiveness (chance of recovery), participants will be unwilling to choose a

treatment that is 50% effective (50% of clients recover) and takes 15 sessions as suggested by Hansen et al (2002).

2. Using a delay discounting instrument comparing treatment duration to treatment effectiveness, participants' expectations for a 50% recovery rate will be closer to Howard et al.'s (1986) 8 session observed 50% recovery rate than it will be to Hansen et al.'s (2002) 15 session observed 50% recovery rate.

3. Participants' expectations of rate of recovery, as measured by a delay discounting instrument comparing treatment duration to treatment effectiveness, will be earlier than the actual treatment outcome recovery rates provided in Howard et al.'s (1986) dose-effect curve.

4. Participant expectations for the dose-effect relationship of treatment will demonstrate a negatively accelerated improvement curve.

CHAPTER III

METHODOLOGY

Participants were recruited from a research participation pool, Experimetrix, which is composed of students currently enrolled at Oklahoma State University. Experimetrix is the OSU psychology department's online subject pool and provides a variety of research experiments in which students can participate in exchange for course credit. Upon registration to this online subject pool, participants had access to the survey which they were asked to complete. All participants were treated in accordance with APA's "Ethical Principles of Psychologists and Code of Conduct" (American Psychiatric Association, 2002).

*Materials*

The online survey was comprised of three sections (presented in order): demographic information, six delay discounting instruments, and other measures used to answer further research questions. A link to the survey as it appeared online is available in Appendix D.

*Delay Discounting Instruments*

Delay discounting procedures have been used since the 1950s and have accumulated broad empirical support. The hyperbolic discounting function has been found to fit both human and animal discounting and has shown to account for between 76% and 99% of the variance in individual discounting functions (Critchfield & Kollins, 2001). Discounting rates have been shown to be stable across time (Critchfield &

Kollins, 2001; Simpson & Vuchinich, 2000) and sensitive to differences between groups expected to discount at different rates (Green, Fry, & Myerson, 1994; Heil, Johnson, Higgins, & Bickel, 2006; Madden, Petry, Badger, & Bickel, 1997).

Participants were asked to complete six delay discounting instruments. The first instrument was developed by Madden, Begotka, Raif, and Kastern (2003) to examine discounting rates for money values. This instrument was used as a warm up instrument designed to introduce and serve as an example for how to complete the following five delay discounting instruments. This instrument is described in more detail in Appendix A.

The second instrument was designed to determine 1) the participants overall discount rate ($k$), and 2) how effective (in terms of rate of recovery) a treatment that lasts 2 sessions must be in order to be seen as equal to a treatment that lasts 1 session and is 15% effective (Howard et al.'s (1986) recovery rate after one session). This instrument is based on Madden et al.'s (2003) instrument described in Appendix A, and a similar instrument can be viewed in Appendix C. Using this instrument, participants were first given the choice of a treatment that lasts one session and is 15% effective and a treatment that lasts 2 sessions and is 15% effective. After the participants indicated the treatment they preferred, the effectiveness of the delayed treatment was increased by 5% (20%) and the participants were again asked to indicate their preference. After each choice the delayed treatment's effectiveness was increased by 10% until it reached a maximum of 100% effective. After this point, the process was immediately repeated in reverse order until the choice was again between a treatment that lasts one session and is 15% effective and a treatment that lasts 2 sessions and is 15% effective. The average of the two values

was taken as the indifference point and was used to determine *k*.

The third discounting instrument was also designed to 1) determine participants overall discount rate (*k*), thus serving as a comparison for the other delay discounting instruments, and 2) how effective (in terms of rate of recovery) a treatment that lasts 4 sessions must be in order to be seen as equal to a treatment that lasts one session and is 15% effective. This delay discounting instrument was identical to the second with only one difference; the delayed session value was 4 sessions instead of 2.

The fourth discounting instrument was also designed to 1) determine participants overall discount rate (*k*), thus serving as a comparison for the other delay discounting instruments, and 2) how effective (in terms of rate of recovery) a treatment that lasts 8 sessions (Howard et al.'s (1986) 50% recovery rate session requirement) must be in order to be seen as equal to a treatment that lasts one session and is 15% effective. This delay discounting instrument was identical to the second with only one difference; the delayed session value was 8 sessions instead of 2.

The fifth discounting instrument was also designed to 1) determine participants overall discount rate (*k*), thus serving as a comparison for the other delay discounting instruments, and 2) how effective (in terms of rate of recovery) a treatment that lasts 15 sessions (Hansen et al.'s (2002) 50% recovery rate session requirement) must be in order to be seen as equal to a treatment that lasts one session and is 15% effective. This delay discounting instrument was identical to the second with only one difference; the delayed session value was 15 sessions instead of 2.

The sixth discounting instrument was also designed to 1) determine participants overall discount rate (*k*), thus serving as a comparison for the other delay discounting

instruments, and 2) how effective (in terms of rate of recovery) a treatment that lasts 26 sessions must be in order to be seen as equal to a treatment that lasts one session and is 15% effective. This delay discounting instrument was identical to the second with only one difference; the delayed session value was 26 sessions instead of 2.

*Other Measures*

*Outcome Questionnaire 45.2.* The self-report Outcome Questionnaire 45.2 (OQ-45.2; Lambert, et al., 1996; Lambert, Okiishi, Finch, & Johnson, 1998) was used to measure participant symptom distress. On the OQ45.2 clients respond to items with categorical ratings ranging from *never* to *almost always* to describe their experiences each week. A total score (ranging from 0 to 180) is generated along with 3 sub-scores representing different conceptual, symptomatic domains: subjective distress (e.g., symptoms of depression, anxiety, etc.), interpersonal functioning (e.g., relationships with others), and social role performance (e.g., school and/or work performances). The OQ-45.2 manual reports that the clinical range is indicated by scores on or above a cut-off score of 63 for the total, and domain scores on or above 36, 14, and 12 for symptom distress, interpersonal functioning, and social role performance, respectively.

According to the OQ-45.2 administration manual, there are no significant differences between male and female samples. The manual also reports a test–retest reliability of .87 for the total and .78 to .82 for the domains, an internal consistency of .93 for the total and .70 to .92 for the domains, and high concurrent validity [.78-.88 correlation of total score with the General Severity Index of the SCL-90-R (Derogatis, 1977), .82-.92 symptom distress domain score with the General Severity Index of the SCL-90-R, .49-.64 interpersonal functioning domain score with the Inventory of

Interpersonal Problems (Horowitz, Rosenberg, Baer, Ureno, & Vallasenor, 1988) and

Social Adjustment Scale (Wiessman & Bothwell, 1976), and .53-.73 correlation of social

role performance domain score with the IIP and SAS]. On the OQ-45.2 no significant

differences according to ethnicity have been identified (Nebeker, Lambert, & Huefner;

1995). An examination of specificity and sensitivity to change during treatment found

the OQ-45.2 to perform adequately (Vermeersch, Lambert, & Burlingame, 2000).

*Milwaukee Psychotherapy Expectations Questionnaire.* The first measure of

treatment expectations used was the 28 item Milwaukee Psychotherapy Expectations

Questionnaire (M-PEQ). This questionnaire was designed by Michael Hynan and

colleagues as an instrument to examine client expectations in the areas of outcome,

therapist characteristics, therapeutic alliance, therapeutic tasks, and targets for change.

Principal components analysis on this questionnaire has produced five factors:

expectations of self in therapy, expectations of improvement after therapy, expectations

of therapeutic activities, expectations of emotional/personal improvement, and

expectations of the therapist/alliance. Confirmatory factor analysis demonstrated a good

fit for the five factor model (NFI = 0.83, NNFI = 0.90, CFI = 0.91, and RMSEA = 0.06).

These factors show both high internal consistencies (ranging from a = 0.81 to a = 0.89)

and high test-retest reliabilities (ranging from $r = 0.73$ to $r = 0.85$) (J. Callahan, personal

communication, September 1, 2006).

*Psychotherapy Expectancy Inventory-Revised.* The second measure of treatment

expectations used was the 30 item Psychotherapy Expectancy Inventory-Revised (PEI-

R), a measure that was originally developed by Rickers-Ovsiankina, Berzins, Geller, and

Rogers (1971) and later revised by Berzins (1971) as a measure of clients' expectations

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of behavior in counseling. This measure is a self-report instrument with items scored on a seven-point Likert-type scale. Principal component analysis on this measure has produced four patient role expectancy categories: approval-seeking, advice-seeking, audience-seeking, and relationship-seeking. Confirmatory factor analysis on the four factor model shows a good fit (IFI = 0.79, CFI = 0.78, CAIC = 959.76, and RMSEA = 0.10). These categories have been shown to have high internal consistency (ranging from a = 0.75 to a = 0.87) and test-retest reliability (ranging from r = 0.54 to r = 0.68 with a one week interval and from r = 0.56 to r = 0.76 with a four week interval) (Rickers-Ovsiankina, Berzins, Geller, & Rogers, 1971). The reliabilities of the four factors are: approval $\alpha_2 = 0.78$, advice $\alpha_2 = 0.85$, audience $\alpha_2 = 0.89$, and relationship $\alpha_2 = 0.89$ (Bleyen, Vertommen, Vander Steene, & Van Audenhove, 2001). Further, no significant differences with regards to age, gender, education level, marital status, and prior experience with therapy have been identified on this measure (Bleyen, Vertommen, Vander Steene, & Van Audenhove, 2001).

*Procedure*

Recruitment of participants was conducted through Oklahoma State University's Experimetrix system. Once registered and logged on to Experimetrix, students had a choice of research projects in which to participate. A short introduction to this survey (which included a brief description of the nature of the study, the approximated length in time required to complete the study, and the qualifications for participation) was presented. After logging on to this study students were taken to a page providing further details and information concerning the study and information concerning informed consent. Students were ensured of confidentiality if they choose to participate. This

confidentiality included that completed surveys would not be linked to any identifying information and that the responses submitted would be stored by a controlled access server.

Upon providing informed consent participants were taken directly to the survey, where they were given further instructions.  Upon completion of the survey, participants submitted their results by clicking on the "submit" button.  Participants were allowed to withdraw from the study at anytime by closing their browser without clicking on the "submit" button.  No data was sent to the researcher until the "submit" button had been clicked.

CHAPTER V

RESULTS

*Preliminary Analyses*

   *Participant Demographics*.  Participants were 110 students currently enrolled at

Oklahoma State University.  The average participant age was 20.58 years ranging from

18 years to 43 years of age with a modal age of 21.  Participants were largely college

students (97.3%) and were relatively evenly distributed across the grade levels: 31%

college seniors, 21% college juniors, 19% college sophomores, and 25% college

freshmen.  The majority of participants endorsed being female (71.8%), single (93.6%),

and of Caucasian ethnicity (82.7%).  Other ethnicities represented in this sample include

Native American (7.3%), African American (5.5%), Hispanic American (1.8%),

Bi/Multi-Racial (1.8%), and Asian American (0.9%).  According to Meyer and Bean's

(1968) method for computing socio-economic status (SES), 47% of participants were

Level 3 SES and 19% of participants were Level 4 SES. Only 2.7% of participants were

currently receiving therapy from a mental health professional at the time of participation.

   *Expected Recovery Rate*. The expected recovery rates were calculated by

averaging individual indifference points across participants. For the 2 session delayed

instrument, participants on average preferred the 2 session treatment over the 1 session

15% effective treatment when it was 25.1% ($SD = 6.53$) effective. Participants on average

preferred the 4 session treatment when it was 44.12% (SD = 17.32) effective, the 8

session treatment when it was 61.62% ($SD = 24.38$) effective, the 15 session treatment

when it was 72.36% ($SD = 24.37$) effective, and the 26 session treatment when it was

77.39% ($SD = 25.00$) effective. A plot of these expected recovery rates can be found in

Figure 2.

*Figure 2*: Expected recovery rates as found in the data with labeled means at 2, 4, 8, 15, and 26 sessions.
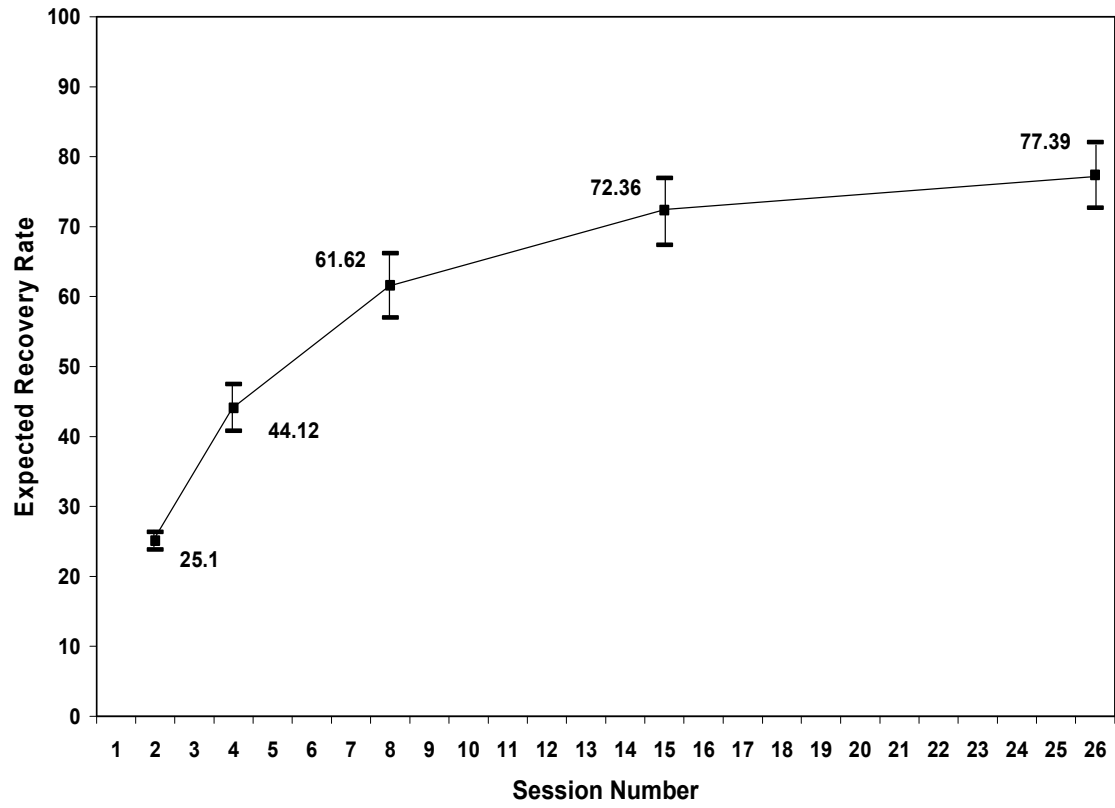


*Note.* Expected recovery rates with 95% confidence interval error bars.

*Discounting Rate*.  Participants' responses on the delay discounting measures were next analyzed to produce an overall sample discount rate using the following formula:

$$V = A / (1 + kD)$$

where *A* is the amount or value of the award delivered after the delay, *D* is the amount of delay, *k* is the parameter that describes the discounting rate, and *V* is the subjective value of the delayed reward.  Using this formula the overall average participant discount rate (*k*) equals .187. This participant discount rate was plotted to produce a hyperbolic function showing the relationship between length of treatment and expected treatment effectiveness in Figure 3. This function shows participants' expected recovery rates for each session. For example, if we are interested in how effective a 10 session treatment is expected to be, we would solve the problem by inserting 10 for the amount of delay (*D*), .187 for the sample discount rate (*k*), 100% for the amount or value of award delivered after the delay (*A*), and (100% – *x*) for the subjective value of the delayed reward (*V*), and then solve for *x*. In this example *x* would equal 65.16%. Therefore, based on the sample discount rate and the hyperbolic function, participants expect 65.16% of clients to recover by the end of 10 sessions. A table indicating these recovery rates across sessions can be seen in Table 1. A comparison between the observed expected recovery rates and the hyperbolic discounting function expected recovery rates can be found in Figure 4.

*Figure 3*. Expected Recovery Rate as Plotted by the Hyperbolic Discount Rate.
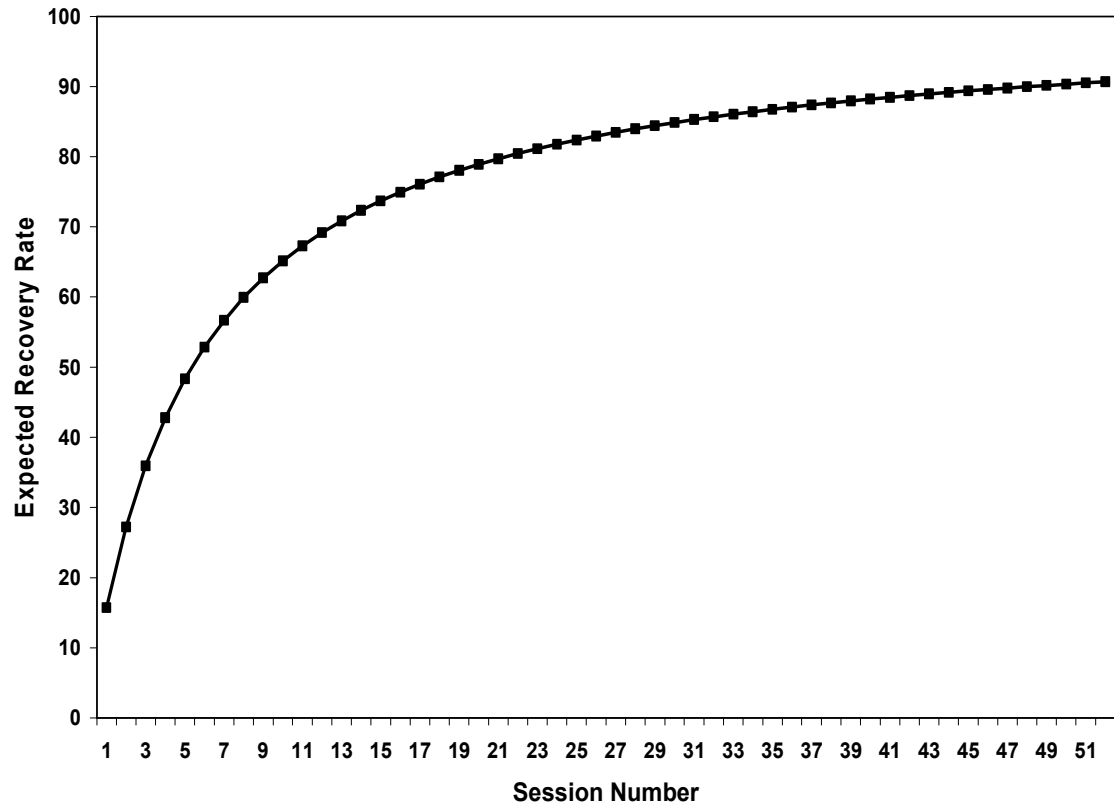
Table 1.

*Hyperbolic Expected Recovery Rates Across Sessions*

| Session number | Expected rate | Session number | Expected rate | Session number | Expected rate |
|---|---|---|---|---|---|
| 1 | 15.75 | 19 | 78.04 | 37 | 87.37 |
| 2 | 27.22 | 20 | 78.90 | 38 | 87.66 |
| 3 | 35.94 | 21 | 79.70 | 39 | 87.94 |
| 4 | 42.79 | 22 | 80.45 | 40 | 88.21 |
| 5 | 48.32 | 23 | 81.14 | 41 | 88.46 |
| 6 | 52.87 | 24 | 81.78 | 42 | 88.71 |
| 7 | 56.69 | 25 | 82.38 | 43 | 88.94 |
| 8 | 59.94 | 26 | 82.94 | 44 | 89.16 |
| 9 | 62.73 | 27 | 83.47 | 45 | 89.38 |
| 10 | 65.16 | 28 | 83.96 | 46 | 89.59 |
| 11 | 67.29 | 29 | 84.43 | 47 | 89.78 |
| 12 | 69.17 | 30 | 84.87 | 48 | 89.98 |
| 13 | 70.85 | 31 | 85.29 | 49 | 90.16 |
| 14 | 72.36 | 32 | 85.68 | 50 | 90.34 |
| 15 | 73.72 | 33 | 86.05 | 51 | 90.51 |
| 16 | 74.95 | 34 | 86.41 | 52 | 90.68 |
| 17 | 76.07 | 35 | 86.75 | | |
| 18 | 77.10 | 36 | 87.07 | | |

*Figure 4*: Expected Recovery Rate as Plotted by the Hyperbolic Function Compared to

the Expected Recovery Rates Found in the Actual Data.
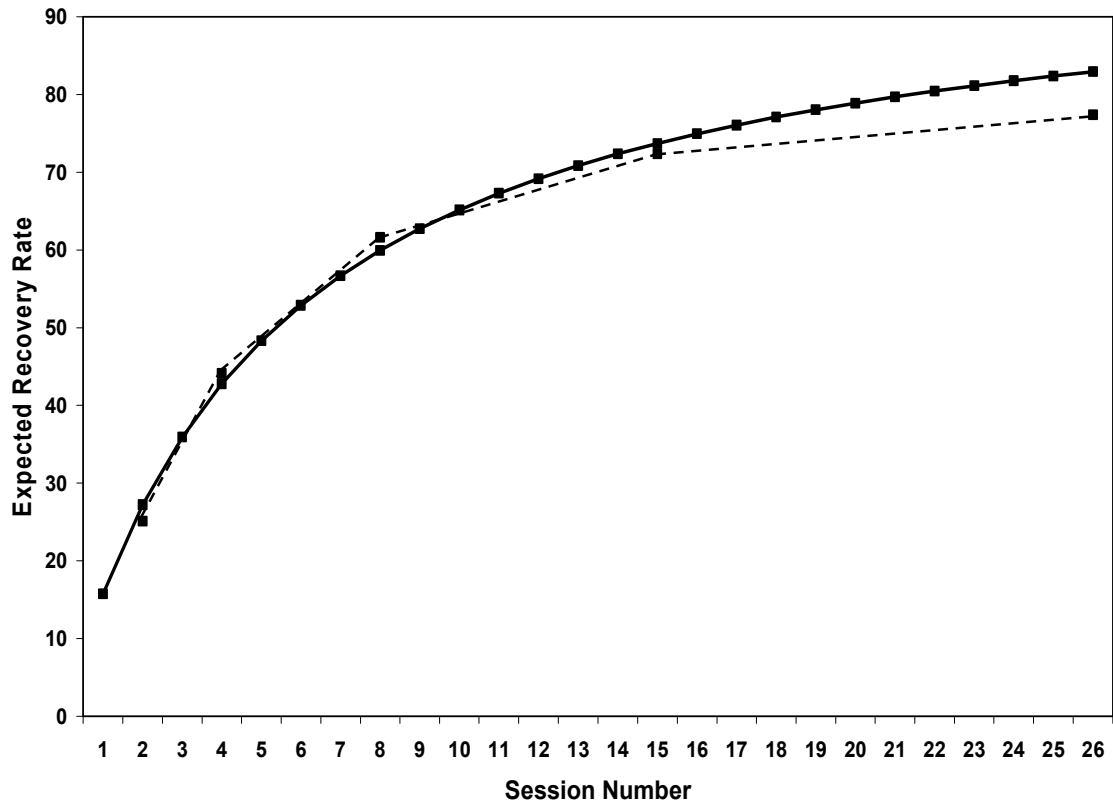
*Note.* – Represents hyperbolic expected recovery rates
    - - Represents actual expected recovery rates

*Analyses for Hypothesis 1*

Two one-sample t-tests were conducted for this analysis. First, a one-sample t-test was conducted to examine if participants' expected effectiveness in terms of rate of recovery for a 8 session treatment was significantly greater than Howard et al.'s (1986) observed effectiveness of 50% participant recovery rate for a 8 session treatment. Two participants were not included in this analysis due to failure to complete the 8 session instrument. This one-sample t-test showed a significant difference [$t(107) = 4.954$, $p < .001$, $d = 0.48$], thus indicating that participants' expectations of a 8 session treatment ($M = 61.62$, $SD = 24.38$) were significantly greater than Howard et al.'s observed effectiveness of 50% ($M_{diff} = 11.62$, $CI_{.95}$: 6.97, 16.27).

Second, a one-sample t-test was conducted to determine if participants' expected effectiveness for a 15 session treatment was significantly greater than Hansen et al.'s (2002) observed effectiveness of 50% for a 15 session treatment. Two participants also did not complete the 15 session instrument and were not included in this analysis. This one-sample t-test also showed a significant difference [$t(107) = 9.537$, $p < .001$, $d = 0.92$], thus indicating that participants' expectations of a 15 session treatment ($M = 72.36$, $SD = 24.37$) were significantly greater than Hansen et al.'s observed effectiveness of 50% ($M_{diff} = 22.36$, $CI_{.95}$: 17.71, 27.01). These results indicate that Hypothesis 1 was supported in that participants' expectations for both an 8 session and a 15 session treatment were greater than the actual effectiveness of treatment as reported by the research (Hansen et al., 2002; Howard et al., 1986).

*Analyses for Hypothesis 2*

A paired-samples t-test was conducted to examine if the difference between the expected effectiveness of a 15 session treatment ($M = 72.10$, $SD = 24.33$) and the observed effectiveness of 50% (Hansen et al., 2002) was significantly greater than the difference between the expected effectiveness of a 8 session treatment ($M = 62.01$, $SD = 24.15$) and the observed effectiveness of 50% (Howard et al., 1986). Three participants were not included in this test due to failure to complete both the 15 session and the 8 session measurement. This paired-samples t-test showed a significant difference [$t(106) = 7.76$, $p < .001$, $d = 0.75$], thus indicating that the difference seen at 15 sessions ($M = 22.10$) was greater than the difference seen at 8 sessions ($M = 12.01$; $M_{diff} = 10.09$, $SD = 13.46$, $CI_{.95}$: 7.51, 12.67). These results indicate that Hypothesis 2 was supported in that participants' expectations for treatment effectiveness in terms of rate of recovery were more similar to Howard et al.'s rate of recovery (50% of clients recover by 8 sessions) as compared to Hansen et al.'s rate of recovery (50% of clients recover by 15 sessions).

*Analyses for Hypothesis 3*

Howard et al.'s (1986) observed rates of recovery at sessions 2, 4, 8, 13, 26, and 52 were compared to participants' expected rates of recovery as determined by the hyperbolic discounting rate at each of those sessions. These differences are shown in Table 2. The shape of both recovery curves as well as the differences demonstrated can be viewed in Figure 5.

Table 2.

*Comparison of Observed and Hyperbolic Expected Recovery Rates*

| Session number | Howard et al. (1986) observed recovery rate | Hyperbolic participant expected recovery rate | Difference |
|---|---|---|---|
| 2 | 30 | 27.22 | -2.78 |
| 4 | 41 | 42.79 | 1.79 |
| 8 | 53 | 59.94 | 6.94 |
| 13 | 62 | 70.85 | 8.85 |
| 26 | 74 | 82.94 | 8.94 |

*Figure 5.* Expected Recovery Rate as Plotted by the Hyperbolic Discount Rate Compared to Howard et al.'s (1986) Observed Recovery Rate.
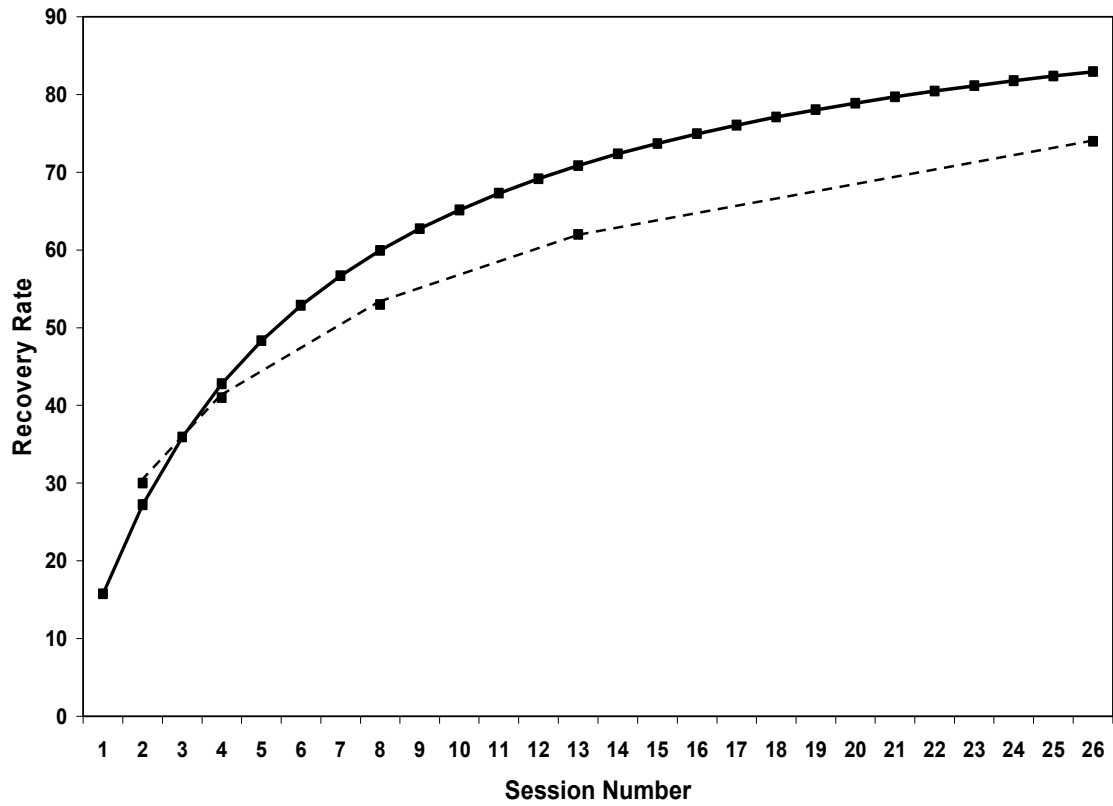


*Note.* – Represents hyperbolic expected recovery rates
    - - Represents Howard et al. (1986) observed recovery rates

It was not possible to compare the expected results found using the hyperbolic function based on the participants' discount rate to Howard et al.'s observed results using a one-sample t-test. Thus, it was decided that the actual expected recovery rates would be compared to Howard et al.'s observed recovery rates using a one sample t-test at each of the points with available data (2, 4, 8, and 26). A visual comparison of the expected recovery rates based on the hyperbolic discount function and the expected recovery rates based on the actual data can be found previously in Figure 4.

One sample t-tests were conducted to compare Howard et al.'s (1986) observed recovery rates to participants' expected recovery rates at sessions 2, 4, 8, and 26. The results of these analyses can be found in Table 3. In summary, these analyses show mixed results in support of Hypothesis 3 which stated that participant expectations for rate of recovery at different session points would be significantly greater than Howard et al.'s observed rate of recoveries. More specifically, this hypothesis was supported at sessions 4 and 8, but was not supported at sessions 2 (where the opposite was observed) or 26 (no significant difference). This comparison of recovery rates can be viewed in Figure 6.

Table 3.

*Comparison of Observed Howard et al. (1986) and Expected Average Recovery Rates*

| | Howard et al. (1986) observed recovery rate | | Sample expected recovery rate | | | |
|---|---|---|---|---|---|---|
| Session number | | N | Mean rate | Standard deviation | t statistic | Effect size d |
| 2 | 30 | 102 | 25.10 | 6.53 | -7.57** | 0.75 |
| 4 | 41 | 108 | 44.12 | 17.32 | 1.86* | 0.18 |
| 8 | 53 | 108 | 61.62 | 24.37 | 3.68** | 0.35 |
| 26 | 74 | 109 | 77.39 | 25.00 | 1.41 | 0.14 |

\* $p < .10$
\*\* $p < .001$

*Figure 6*: Expected Recovery Rate as Found in the Actual Data Compared to the

Observed Recovery Rates Found by Howard et al. (1986).
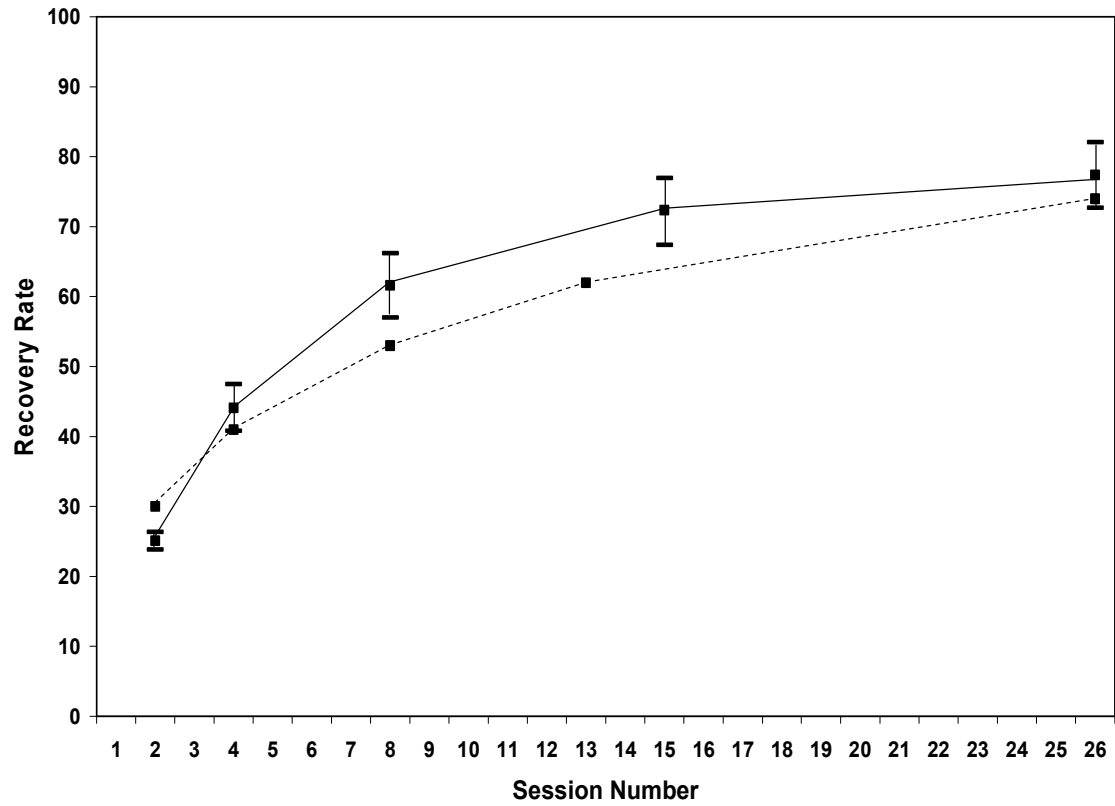


*Note.* – Represents actual expected recovery rates
      - - Represents Howard et al. (1986) observed recovery rates

*Analyses for Hypothesis 4*

      A one-way within subjects Analysis of Variance was conducted to determine if participants' expected rate of recovery differed between 2, 4, 8, 15, and 26 sessions. Eleven participants were not included in this analysis due to their failure to complete all 5 measures. The omnibus effect was significant [$F(4, 392) = 271.09$, $p < .001$, $\eta^2 = 0.73$], indicating that there was a difference in participants' expected rate of recovery across these sections. A trend analysis was further conducted to examine the difference across these conditions. Trend analysis indicates that both a linear trend [$F(1, 98) = 482.57$, $p < .001$, $\eta^2_{alerting} = .94$] and a quadratic trend [$F(1, 98) = 53.54$, $p < .001$, $\eta^2_{alerting} = .05$] are significant. Thus indicating that, in general, as the number of sessions increases so does the expected rate of recovery (linear). However, a straight linear line may not be the best descriptor of the trend. Instead a negatively accelerated curve may be a better descriptor (as indicated by the significant quadratic trend) of the expectations. Although presented with other data in previous figures, this curvilinear trend as well as the means at each session can be viewed alone previously in Figure 2.

      A one-way within subjects Analysis of Variance was then conducted to determine if participants' per session expected rate of recovery differed between 2, 4, 8, 15, and 26 sessions. Participants' per session expected rate of recovery was calculated by dividing the expected rate of recovery by the number of sessions at which that recovery rate is expected. For example, if participants expect 25% of clients to recovery by two sessions, then they expect 12.5% to recovery each session. If participants expect a 44% recovery rate at 4 sessions, then they expect 11% of clients to recovery each session. This one-way within subjects Analysis of Variance produced a significant omnibus effect [$F(4, 392) =$

398.11, $p < .001$, $\eta^2 = 0.80$], indicating that the participants' per session expected rate of recoveries differed between the sessions. Post-hoc paired-samples t-tests further indicated the difference between the per session recovery rates. The results of these analyses can be found in Table 4. These results further indicate that Hypothesis 4 was supported in that a positive negatively accelerated curve was demonstrated in participants' expectation for rate of recovery.

Table 4.

*Comparison of the Expected Per Session Recovery Rates*

| Session number | Expected per session recovery rate | | Comparison | $N$ | $t$ statistic | Effect size $d$ |
|---|---|---|---|---|---|---|
| | Mean rate | Standard deviation | | | | |
| 2 | 12.53 | 3.29 | | | | |
| 4 | 11.23 | 4.14 | 2 vs. 4 | 101 | 3.67* | 0.37 |
| 8 | 7.79 | 3.00 | 4 vs. 8 | 106 | 14.49* | 1.41 |
| 15 | 4.81 | 1.65 | 8 vs. 15 | 107 | 16.37* | 1.58 |
| 26 | 2.97 | 0.97 | 15 vs. 26 | 108 | 19.48* | 1.88 |

* $p < .001$

*Secondary Analyses*

The results from the primary analyses and the analysis of the hypotheses gave rise to further hypotheses. The hypotheses or questions included: whether participants discounting rate in general correlated with their preferences among the treatment options, whether participants that were experiencing a significant amount of distress in their own life would differ from participants who were not experiencing a significant amount of distress in their expectations of the effectiveness of the treatments, whether participants expectations would differ from more recent data (as compared to the Howard et al. (1986) data) from the dose effect literature. These further questions or hypotheses were tested as part of secondary analyses.

*Effect of Discounting Rates*. Participants' discounting rates in general (as measured by the delay discounting instrument using money) may affect the way in which they discounted the choices when pertaining to the differing treatment options (session 2, 4, 8, 15, and 26 delay discounting instruments). Pearson's correlations indicate that there was not a significant association between the money discounting instrument and any of the treatment instruments. However, each of the treatment discounting instruments were significantly associated with each other. The correlations can be found in Table 5. These results indicate that participants discount money differently than they do psychological treatment options. These results are consistent with other studies which indicate that participants discount money choices differently than they do health care choices (Chapman, Nelson, and Hier, 1999).

Table 5.

*Pearson's Correlation Coefficients Between Discounting Instruments*

|  | Money delay | 2 session delay | 4 session delay | 8 session delay | 15 session delay |
|---|---|---|---|---|---|
| Money delay |  |  |  |  |  |
| 2 session delay | -.11 |  |  |  |  |
| 4 session delay | -.08 | .50* |  |  |  |
| 8 session delay | -.07 | .46* | .84* |  |  |
| 15 session delay | -.002 | .40* | .69* | .85* |  |
| 26 session delay | .03 | .41* | .60* | .74* | .84* |

* *p* < .001

*Effect of Level of Distress*. Participants' level of distress (as measured by the OQ-45.2) may have an effect on their expectations of the effectiveness of the treatments. Participants who scored 64 or above on the OQ-45.2 (clinically significantly distressed; $N$ = 31) were compared to participants who scored below 64 on the OQ-45.2 (normal levels of distress; $N = 79$) on their expectations for each of the treatment discounting instruments. Independent samples t-tests indicated that distressed participants were not significantly different from non-distressed participants in their expectations on all of the treatment discounting instruments. These results are reported in Table 6. Further, Pearson's correlations were used to determine whether or not scores on the OQ-45.2 were related to expectations at any of these points. Scores on the OQ-45.2 were not significantly correlated with any of the treatment discounting instruments. The correlations are reported in Table 7. These results indicate that participants' level of personal distress did not co-vary with their expectations of the effectiveness of treatment.

Table 6.

*Comparison of Expectations Between Distressed and Non-Distressed Participants*

| Session number | Distressed | | | Non-distressed | | | $t$ statistic | Effect size $d$ |
|---|---|---|---|---|---|---|---|---|
| | $N$ | Mean rate | Standard deviation | $N$ | Mean rate | Standard deviation | | |
| 2 | 27 | 24.44 | 7.12 | 75 | 25.33 | 6.35 | 0.60 | 0.14 |
| 4 | 30 | 41.17 | 14.953 | 78 | 45.26 | 18.18 | 1.10 | 0.24 |
| 8 | 31 | 55.81 | 22.48 | 77 | 63.96 | 24.56 | 1.58 | 0.34 |
| 15 | 31 | 67.58 | 24.39 | 77 | 74.29 | 24.25 | 1.30 | 0.28 |
| 26 | 31 | 72.58 | 26.67 | 78 | 79.29 | 24.21 | 1.27 | 0.27 |

* $p < .05$

Table 7.

*Pearson's Correlation Coefficients Between Distress (OQ-45.2 Scores) and the*

*Discounting Instruments*

|  | OQ-45.2 scores | 2 session delay | 4 session delay | 8 session delay | 15 session delay |
|---|---|---|---|---|---|
| OQ-45.2 scores |  |  |  |  |  |
| 2 session delay | -.06 |  |  |  |  |
| 4 session delay | -.11 | .50* |  |  |  |
| 8 session delay | -.17 | .46* | .84* |  |  |
| 15 session delay | -.09 | .40* | .69* | .85* |  |
| 26 session delay | -.12 | .41* | .60* | .74* | .84* |

* $p < .001$

*Comparison to Dose-Effect Literature*. A comparison of participants' expectations

to Howard et al.'s (1986) observed effectiveness showed mixed results. However,

Howard et al.'s figures represent reliable change, not clinically significant change.

Currently the dose-effect literature uses clinically significant change when determining

treatment effectiveness. A comparison of participants' expectations to recent clinically

significant change data may be more meaningful. As a result a comparison between

participants' expectations at 15 sessions to Hansen et al.'s (2001) 15 session effectiveness

of 50% was performed in the analysis of hypothesis one.  This analysis showed a

significant difference. Unfortunately Hansen et al. did not provide percentages for clients

recovered at other session points. In the 5th Edition of the Handbook of Psychotherapy

and Behavior Change (2003) a section devoted to the dose-effect literature reports a

graph showing the percentage of clients to reach clinically significant change at different

session points. This graph was originally published by Lambert, Hansen, and Finch

(2001).

One sample t-tests were conducted to determine whether or not participant

expectations at 2, 4, 8, 15, and 26 sessions were significantly different from the actual

rate of recovery for these sessions as described by Lambert et al. (2001). The difference

between Lambert et al.'s recovery rates and the expected recovery rates were

significantly different at each of the session points. These differences are reported in

Table 8. In summary, these analyses indicate that participants expect higher rates of

recovery than what is indicated currently (based on recovery being defined as clinically

significant and reliable change) in the dose-effect literature. A visual comparison of the

observed and expected recovery rates can be viewed in Figure 7.

Table 8.

*Comparison of Observed Lambert et al. (2001) and Expected Average Recovery Rates*

| Session number | Lambert et al. (2001) observed recovery rate | | $N$ | Sample expected recovery rate | | $t$ statistic | Effect Size $d$ |
| | | | | Mean rate | Standard deviation | | |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 5 | | 102 | 25.10 | 6.53 | 31.07* | 3.08 |
| 4 | 16 | | 108 | 44.12 | 17.37 | 16.82* | 1.62 |
| 8 | 30 | | 108 | 61.62 | 24.38 | 13.48* | 1.30 |
| 15 | 43 | | 108 | 72.36 | 24.37 | 12.52* | 1.20 |
| 26 | 54 | | 109 | 77.39 | 25.00 | 9.78* | 0.94 |

* $p < .001$

*Figure 7*: Expected Recovery Rate as Found in the Data as Compared to Lambert et al.'s

(2001) Observed Recovery Rate.
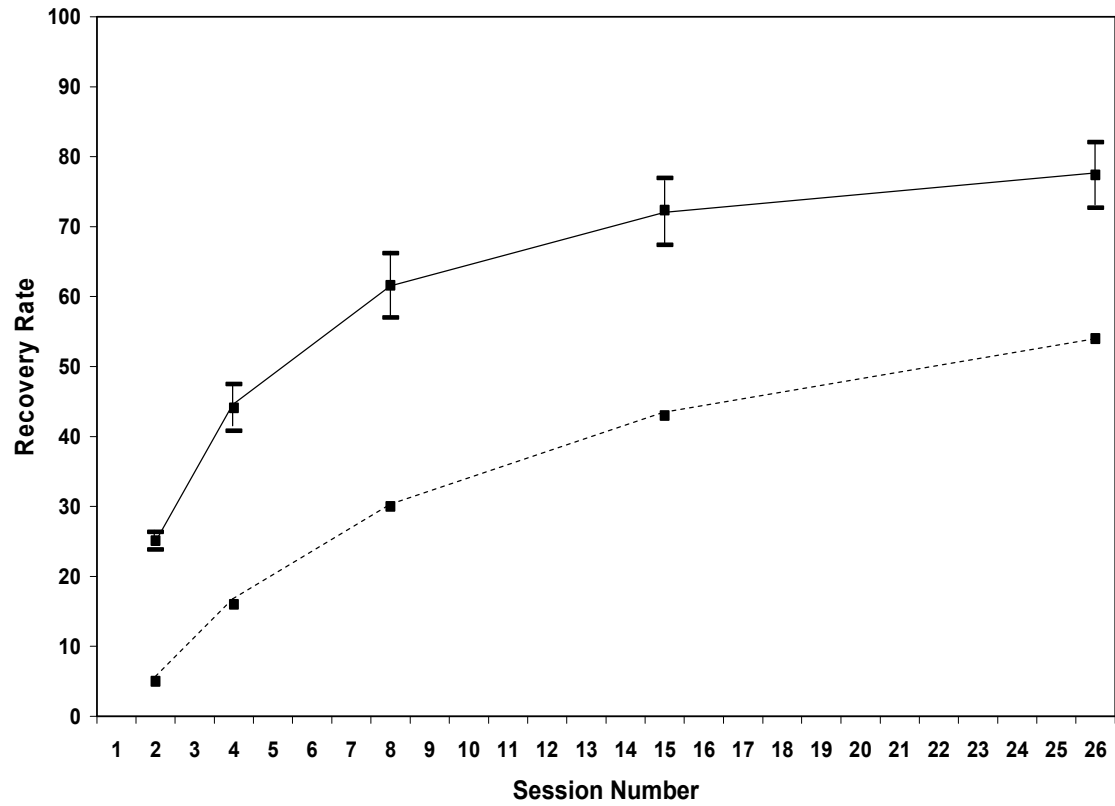


*Note.* – Represents actual expected recovery rates
      - - Represents Lambert et al. (2001) observed recovery rates

CHAPTER VI

DISCUSSION

The dose-effect literature indicates that it takes somewhere between 8 sessions (Howard et al., 1986) and 15 sessions (Hansen et al., 2002) of psychotherapy for 50% of clients to recover. However, the literature also indicates that the average number of sessions that a client attends is somewhere between 3 and 5. Thus, a large number of clients are discontinuing treatment before they have actually recovered, a phenomenon known as premature termination. A number of studies examining this phenomenon of premature termination note that unmet client expectations may play a large role in clients' reasons for discontinuation of treatment (Garfield, 1984). Much of the literature exploring the effect of unmet expectations on early termination has focused on unmet role expectations (e.g., Hardin, Subich, & Holvey, 1988; Nock & Kazdin, 2001; Reis & Brown, 1999; Walitzer, Dermen, & Connors, 1999), while little attention has been given to unmet outcome expectations. When considering treatment outcome expectations the literature indicates that 73% of clients expect to attend 10 or fewer sessions and 48% of clients expect 5 or fewer sessions. However, these assessments of expected treatment outcome have failed to take into account treatment effectiveness (which the dose-effect literature indicates is tied to treatment duration in actual clients). The purpose of this study was to examine both participants' expectations of treatment duration and expectations of treatment effectiveness by using a delay discounting model.

First, participants' expectations of the effectiveness and duration of psychotherapy were determined through five discounting instruments. Each instrument asked participants to choose between a one session treatment that is 15% effective (15% of clients recover after one session) and another treatment of altering lengths and recovery rates. Using this method it was found that participants expected a 2 session treatment to have a 25% recovery rate, a 4 session treatment to have a 44% recovery rate, an 8 session treatment to have a 62% recovery rate, a 15 session treatment to have a 72% recovery rate, and a 26 session treatment to have a 77% recovery rate. These findings were then plotted based on the hyperbolic discounting function given by Mazur (1987) in order to determine expected recovery rates across any given number of sessions. Using this method participants' effectiveness expectations can be provided for any given treatment duration. For example, participants expect 91% of clients to recover by the end of 51 sessions whereas they only expect 80% of clients to recover by the end of 20 sessions.

Using these methods the relationship of participant expectations was further examined. It was found that participants' expectations for effectiveness follow a negatively accelerated positive curve across sessions. The curve demonstrates that participants expect big gains in rate of recovery after the early sessions of treatment followed by continual but diminishing gains as treatment continues in length. Interestingly, this negatively accelerated positive curve in participant expectations is the same pattern that is observed in actual treatment outcome just at a different level.

Participant expectations concerning treatment effectiveness were then compared to the observed effectiveness of treatment as provided by the dose effect literature.

Howard et al. (1986) indicated that 50% of clients recover after 8 sessions. Participants on the other hand expect 62% of clients to recover after this number of sessions. Howard et al.'s recovery rates were further compared to participants' expectations at 2 sessions, 4 sessions, 8 sessions, and 26 sessions. This comparison indicated that participants' expectations for rate of recovery are higher at sessions 4 and 8, but not at session 2 (where Howard et al. indicated higher recovery rates) or 26 (where there was no difference between the observed recovery rates and expected recovery rates).

However, Howard et al.'s figures may be an overly optimistic view of what actually occurs in psychotherapy. Two criticisms with Howard et al.'s rates are that pre-post- measurements and reliable improvement were used in their measurements of the observed rate of recovery. On the other hand, Hansen et al. (2002) used clinically significant change and session-by-session survival analysis to determine whether or not a client had recovered. Using this more stringent method Hansen et al. (2002) found that it takes approximately 15 sessions for 50% of clients to recover. Participants on the other hand expect 72% of clients to recover by the end of 15 sessions, indicating a greater difference than observed when comparing the expectations to Howard et al.'s observed results.

Unfortunately, Hansen et al. (2002) only provided the 50% observed recovery rate in actual treatment. In the 5th Edition of Bergin and Garfield's Handbook of Psychotherapy Change (2004) Lambert and Ogles report recovery rates found by Lambert, Hansen, & Finch (2001) across a number of sessions. The recovery rates indicated by Lambert et al. were compared to client expectations at 2, 4, 8, 15, and 26 sessions. In contrast to the comparison with Howard et al.'s (1986) observed recovery

rates, this comparison showed a difference between participants' expectations and observed recovery rates at each session. These comparisons indicate that participants' expectations for the effectiveness of psychotherapy are more stringent than the actual effectiveness of psychotherapy.

*Implications*

The difference between expectations of psychotherapy and the actual effectiveness of psychotherapy may play a role in the large number of clients discontinuing treatment before they have actually recovered. One explanation is that clients may enter therapy expecting to recover after only a relatively brief number of sessions, then when they do not recover as quickly as expected they drop out of treatment feeling unsatisfied. Another explanation tying premature termination to unmet expectations pertains to early improvement in clients. The phase model (Howard, Lueger, Maling, & Martinovich, 1993) suggests that clients make early gains in remoralization (subjective well-being). Clients may experience this early improvement and assume that they have recovered, since the improvement is in line with their expectations, and as a result discontinue treatment before the actual change has taken place. It is likely that one or the other may play a role in premature termination depending on the client and the treatment process/outcome of the individual case.

Based on these results the question that follows is what can be done to improve treatment outcome and lessen the number of clients who terminate from treatment prematurely. The literature examining unmet role expectations indicates that educating or training clients at the start of treatment in this area improves client satisfaction, lengthens treatment duration, and improves overall treatment outcome (e.g., Orlinsky, Grawe, &

Parks, 1994; Reis & Brown, 2006; Scamardo, Bobele, Biever, 1999; Walitzer, Dermen, & Connors, 1999; Zwick & Attkisson, 1985). It would therefore follow that educating clients with regards to the effectiveness and duration of treatment would have similar effects. For example, a client could be told that studies indicate that it takes around 15 sessions for 50% of clients to recover and around 30 to 40 sessions for 75% of clients to recover. Educating clients in this manner may alter their treatment expectations to bring them more in line with what actually occurs in psychotherapy. More realistic expectations may in turn have an effect on improving treatment satisfaction, treatment duration, and treatment outcome.

*Limitations of the Study*

Two major limitations must be considered when interpreting the results of this study: the sample population and the questions asked. This study was conducted with undergraduate students enrolled at Oklahoma State University as participants; however, it is possible that clients actually seeking psychological services have different expectations of psychotherapy as compared to the undergraduate sample used in this study. One theory about why clients may have different expectations is because the questions are more personally relevant to them; they may expect treatment to be less effective because they know the extent of their suffering. However, Chapman, Nelson, and Heir (1999) conducted a study in which they asked participants to choose between medical treatments using a delay discounting method. In this study participants made decisions in both a familiar and unfamiliar domain. Patient participants with a diagnosis of either migraine headaches or inflammatory bowel disease were given discounting scenarios concerning their own disorder and the other group's disorder. This study indicated that participants

discounted both the familiar and unfamiliar scenario in the same manner. Thus student participants in this study may have discounted in the same way as would client participants who are actually seeking services.

A further analysis was completed comparing students who were similar to a client population in the amount of symptoms and distress they were experiencing to students who were dissimilar to a client population in the amount of symptoms and distress they were experiencing. This analysis showed no difference between the groups in their expectations of the treatment. Further, level of distress was not significantly correlated with expectations for treatment effectiveness. These results further indicate that the student participants in this study may have discounted in the same way, thus expressing similar expectations, as would client participants who are actually seeking services.

The second limitation in this study is found in the questions that the participants were asked. Participants were asked to choose between treatments that differed in length and level of effectiveness. In these questions level of effectiveness was defined as rate of recovery (i.e., the percent of clients to recover by the end of a given number of sessions). This definition of effectiveness was used in order to facilitate comparison to the dose-effect literature which also uses rate of recovery. However, rate of recovery may not be the most meaningful definition of effectiveness for the individual participant. Instead, a more meaningful definition for the individual may be level of symptom improvement. An example of this type of question would be: "Would you prefer a treatment that lasts 1 session and alleviates 15% of your distress/symptoms or one that last 15 sessions and alleviates 100% of your distress/symptoms?" Current methods, including the OQ-45.2, can predict clients' trajectories of improvement across sessions based on their levels of

distress at the beginning of treatment (Lambert, Hansen, & Finch, 2001). However, explaining trajectories of improvement to clients in terms of percent of symptom alleviation may be difficult. Problems in this area include: defining symptom alleviation as a decrease in the number of symptoms, as a decrease in the level of symptoms, as a decrease in level of impairment, or as an increase in general well-being. Trajectories may not account for improvement in all of these areas. Further, the given trajectories are based on aggregates across clients and may not fit the individual client's progress in therapy. It therefore may be more beneficial to ask participants about their expectations in terms of rate of recovery as compared to expectations in terms of symptom alleviation.

*Further Directions*

Based on the results, implications, and limitations of this study further directions in the research are apparent. One further direction would be to study expectations in the same manner with actual clients seeking psychological services. Although the earlier discussion indicated that actual clients may not express expectations that are different from the given sample's expectations, it would still be beneficial to conduct a study to test this hypothesis. In such a study clients would be given similar discounting instruments prior to their initial session of treatment. Based on the results of those instruments clients' expectations could then be compared to the actual effectiveness of treatment as indicated by the dose-effect literature.

Further research could also explore the effects of educating clients with regards to outcome prior to treatment. A study exploring this effect may compare a group of clients who are told the actual effectiveness of psychotherapy (i.e., "the research indicates that it takes about 15 sessions for 50% of clients to recover") to a group of clients who are not

given information regarding the actual effectiveness of psychotherapy. A comparison of the resulting expectations of both groups would be insightful as would a comparison between the groups on overall treatment duration, treatment satisfaction, and treatment outcome.

*Conclusions*

The purpose of this study was to examine participant expectations for both treatment duration and treatment effectiveness by using a delay discounting model. Participant expectations were found to follow a positive negatively accelerated curve, in that large increases in recovery rates were expected after the initial sessions of psychotherapy followed by smaller but continual increases across sessions. Participant expectations were further found to be significantly greater or faster (participants expect more clients to recover) than the actual effectiveness of psychotherapy as indicated by the dose-effect literature. This discrepancy between participant expectations and the actual treatment effectiveness may account for some of the reasons why a large number of clients terminate from treatment prematurely. Educating clients prior to treatment in this area may be beneficial in altering the unrealistic expectations and may have positive effects on the overall treatment.

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APPENDIX A

Two delay discounting models using money (1) adapted from Chapman, Nelson, and

Hier (1999) and (2) adapted from Madden, Begotka, Raiff, and Kastern (2003).

(1)      Imagine that you have just won a cash prize and you have the choice between

receiving $400 right now and $700 one month from now; which would you rather

receive?  If a participant preferred the delayed amount, then that amount would be

lowered to $500 and the same question would be asked.  If the participant preferred the

immediate amount, then the delayed amount would be increased to $900 and the same

question would be asked.  This method is continued until the participants indifference is

established within $100.  If a participant said, for example, that he/she preferred the

delayed amount at $500, but preferred the immediate amount if the delayed amount was

$400, then that participant's indifference point would be between $400 and $500, and

would be assumed to be $450.  By comparing this indifference point to the immediate

amount we see that the value of a one month wait for this participant would be $50.  If a

participant said, for example, that he/she preferred the delayed amount at $700, but

preferred the immediate amount if the delayed amount was $600, then that participant's

indifference point would be between $600 and $700, and would be assumed to be $650.

By comparing this indifference point to the immediate amount we see that the value of a

one month wait for this participant would be $250.

(2)    I am going to ask you to make some decisions about which of two rewards you would prefer.  One of the rewards will always be available right now, and the other will only be available after a short period of time.  The first choice is between $10 delivered immediately and $10 delayed by 6 hours.  After the participants indicated the reward they preferred (the immediate reward in all cases), the immediate reward was decreased to the next amount ($9.90).  This sequence continued through the entire deck of immediate rewards, regardless of participant's behavior.  When a participant switched from the immediate to the delayed reward, the value of the last immediate reward chosen was recorded.  When the end of the deck of immediate rewards was reached, the process was repeated in reverse order, with the experimenter recording the first immediate reward selected.  The average of the two recorded values was taken as an indifference point, at which the small-immediate and large-delayed rewards were of equal subjective value to the participant.

APPENDIX B

Delay discounting model for medical treatment options adapted from

Chapman, Nelson, and Hier (1999)

Imagine that you get 10 migraine headaches per month and you have your choice between two medications.  The first medication reduces the number of headaches to 6 per month starting right away.  The second medication will reduce headaches more effectively to 3 per month, but this decrease will not start until one month from now. Each medication would need to be taken for the next five years.  Which medication would you prefer to take?  If the participant, for example, said that he/she would prefer the delayed medication at 3 headaches per month, but preferred the immediate medication if the delayed medication was at 4 headaches per month, then that participant's indifference point would be between 3 and 4 migraine headaches per month, and would be assumed at 3.5.  By comparing this indifference point to the immediate amount we see that the value of a one month wait for this participant would be 2.5 headaches.

APPENDIX C

Delay discounting model for psychological treatment options.

Imagine that you are currently experiencing a significant amount of distress in life

which has led you to consider seeking some form of a psychological treatment. Of the

available treatments you have the choice of a treatment that lasts one session and is 15%

effective and a treatment that lasts 15 sessions and is 15% effective. After the

participants indicate the treatment they prefer, the effectiveness of the delay treatment is

increased by 5% (20%) and the participants are again asked to indicate their preference.

After each choice the delay treatment's effectiveness is increased by 10% until it reaches

a maximum of 100% effective. After this point, the process is immediately repeated in

reverse order until the choice is again between a treatment that lasts one session and is

15% effective and a treatment that lasts 15 sessions and is 15% effective. The average of

the two values is taken as the indifference point and can be used to determine the

discounting rate ($k$) in the formula $V = A/(1 + kD)$ and can be plotted as a function of

expected effectiveness over differing treatment lengths..

APPENDIX D

Survey as it Appears on the World Wide Web

The web site for which the survey is found is:

http://fp.okstate.edu/cacr/JSthesis.htm.

**Oklahoma State University Institutional Review Board**

Date:                           Friday, October 27, 2006

IRB Application No     AS06129

Proposal Title:            Expectations of Psychotherapy Study

Reviewed and          Expedited
Processed as:

**Status Recommended by Reviewer(s): Approved    Protocol Expires:    10/26/2007**

Principal
Investigator(s

Joshua  Swift                          Jennifer L. Callahan
215 N. Murray                        215 N. Muray
Stillwater,  OK  74078            Stillwater,  OK  74078

The IRB application referenced above has been approved.  It is the judgment of the reviewers that the
rights and welfare of individuals who may be asked to participate in this study will be respected, and that
the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45
CFR 46.

X The final versions of any printed recruitment, consent and assent documents bearing the IRB approval
   stamp are attached to this letter.  These are the versions that must be used during the study.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved.  Any modifications to the research protocol
   must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar
   year.  This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly.  Adverse events are those which are
   unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved protocols are subject to monitoring by the IRB and that the IRB office has the
authority to inspect research records associated with this protocol at any time.  If you have questions
about the IRB procedures or need any assistance from the Board, please contact Beth McTernan in 219
Cordell North (phone: 405-744-5700, beth.mcternan@okstate.edu).

Sincerely,

Sue C. Jacobs, Chair
Institutional Review Board

VITA

Joshua Swift

Candidate for the Degree of

Master of Science

Thesis: EXPECTAIONS OF THE DURATION AND EFFECTIVENESS OF PSYCHOTHERPAY: A DELAY DISCOUNTING PERSPECTIVE

Major Field: Psychology

Biographical:

Education: Graduated with a Bachelor of Science in Psychology from Brigham Young University, Provo, Utah in April 2005. Received the degree of Master of Science in Psychology from Oklahoma State University, Stillwater, Oklahoma in May 2007.

Professional Memberships: American Psychological Association

Name: Joshua Keith Swift                     Date of Degree: May, 2007

Institution: Oklahoma State University       Location: Stillwater, Oklahoma

Title of Study: EXPECTATIONS OF THE DURATION AND EFFECTIVENESS OF
                PSYCHOTHERPAY: A DELAY DISCOUNTING PERSPECTIVE

Pages in Study: 93                  Candidate for the Degree of Master of Science

Major Field: Psychology

Scope and Method of Study: The present study was designed to examine expectations for the duration and effectiveness of psychotherapy by using a delay discounting model. In this study participants were asked to indicate their preferences on a number of delay discounting choices concerning treatments with altering effectiveness and durations. Specifically, participants in this study were asked to choose between a treatment that lasts only a few number of sessions and has a low recovery rate and a treatment that lasts a greater number of sessions and has altering recovery rates. For example, the participants were asked "Would you prefer a treatment that lasts 1 session and has a 15% recovery rate or a treatment that lasts 15 sessions and has a 50% recovery rate?" This method was repeated with participants responding to a 2 session, a 4 session, an 8 session, a 15 session, and a 26 session delayed treatment scenario.

Findings and Conclusions:  Data from 110 participants indicates that a 2 session treatment is expected to have a 25% recovery rate, a 4 session treatment is expected to have a 41% recovery rate, an 8 session treatment is expected a 62% recovery rate, a 15 session treatment is expected to have a 72% recovery rate, and a 26 session treatment is expected to have a 77% recovery rate. When the data is fit into a hyperbolic function expected recovery rates for any given number of sessions are found. The results from this study indicate that expected recovery rates are significantly different from the actual recovery rates indicated in the literature. Specifically, a 15 session treatment is observed to be 50% effective (Hansen et al., 2001); however, participants expect a 15 session treatment to be 72% effective. Similar differences were found when comparisons were made at the 2, 4, 8 and 26 session points. Interestingly, when comparing participant expectations to the dose-effect literature, results show a similar shaped curve for expectations (a positive negatively accelerated curve); however, participant's expectations for the recovery rate are significantly higher at each of the session points. This discrepancy has important implications in understanding premature termination from psychotherapy.

ADVISER'S APPROVAL:   Jennifer L. Callahan, PhD