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Psychodynamic psychotherapy for depression: Illuminating processes of change using a time-series design

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To the Graduate Council:

I am submitting herewith a thesis written by Erin Irene Gray entitled "Psychodynamic psychotherapy for depression: Illuminating processes of change using a time-series design." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts, with a major in Psychology.

Michael R. Nash, Major Professor

We have read this thesis and recommend its acceptance:

Derek R. Hopko, John W. Lounsbury

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

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Psychodynamic psychotherapy for depression: Illuminating processes of change using a time-series design

A Thesis
Presented for the
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Abstract

This study examined the process of change in the early stages of psychodynamic psychotherapy for three patients with Major Depressive Disorder (MDD). The three patients were in once-weekly psychotherapy at a university-based psychological clinic with supervised master's level therapists in a clinical psychology doctoral training program. Subjective well-being and symptoms were monitored daily throughout treatment (consisting of 9, 12, and 13 sessions). Based on theory-driven models of therapeutic change (Phase Model of change: Howard, et al., 1986; Howard, et al., 1993), improvement in subjective well-being ought to occur early in therapy and prior to improvement in diagnosis-specific symptoms. Six phase-specific outcome patterns were defined (18 across the three patients) that ought to obtain according to the Phase Model of therapeutic change. Time-series analyses were applied to test whether the improvement realized in each case unfolded in the pattern predicted by theory. It did not, neither on a case-by-case basis, nor when all cases were taken together. Only 4 of the 18 conditions were satisfied. Though the findings are in no way definitive, the pattern of improvement in these three cases did not conform to that predicted by the Phase Model of therapeutic change. The current study provides an important methodological template for examining the process of change in psychotherapy using a time-series design.

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Introduction

In this study, the trajectory of change was examined for three depressed adult patients in the early stages of weekly psychodynamic psychotherapy.

Case 1. Mr. A is an unmarried, 42-year-old African-American male who comes to therapy reporting a longstanding struggle with depression for which he has never sought treatment. Mr. A's financial and work-related problems have recently intensified and he is feeling unable to pull himself out of the downward spiral. His job performance is suffering and he is beginning to question his passion for his career. Mr. A is living alone and reported that his only relationships are with his co-workers. Along with sorrow and dejection, Mr. A. reports difficulty concentrating, indecisiveness, sleep disturbances, apathy, low self-esteem, social withdrawal, anxiety, boredom, and a loss of energy. Mr. A's therapist describes him as a bright and articulate man who is reluctant to discuss his feelings, yet appears open to the therapeutic experience.

Case 2. Ms. L is a quiet, educated, and attractive 54-year-old Caucasian woman. She recently relocated after a divorce from an alcoholic and physically abusive husband of 20 years. Ms. L is experiencing significant sadness, guilt, and grief in regard to leaving her husband, friends, and satisfying career. In addition, Ms. L reports sadness, apathy, low self-worth, sleep problems, uncontrollable crying, and a lack of energy since she was a teenager. She expresses ambivalence regarding the decision to stay or return to her ex-husband. She is also stressed about not being able to secure a job after moving. Her insomnia has also worsened; sapping her energy further and making her situation seem insurmountable. During the intake interview, Ms. L is very tearful but clearly shows her desire and capability to benefit from therapy.

Case 3. Ms. Q is a recently divorced 34-year-old Brazilian woman. At intake, Ms. Q is upset about her recent divorce, reporting that she is feeling very self-critical and fragile. She

reports difficulty “moving on” following the divorce due to an extreme sense of guilt related to leaving her husband. Ms. Q has no social support and relies almost entirely on her romantic partners, which has led her to rush into a new relationship. She currently reports trouble sleeping, low self-esteem, suicidal ideation without intent, and feeling very sensitive to criticism. Over the past 10 years, Ms. Q reports experiencing several emotional breakdowns, but has felt unable to enter therapy until now. Ms. Q also wants to work on her relationship with her mother, which she reports as emotionally abusive. Additionally, she recently discontinued the use of anti-depressant medication against the wishes of her prescribing physician. Her therapist reports that she is cooperative, open, and ready to begin psychotherapy.

With the arrival of the evidence based practice movement, the majority of psychotherapy research has become almost solely concerned with outcome (Westen, Novotny, & Thompson-Brenner, 2004). Still, other areas of inquiry deserve investigation, such as addressing how the process of therapeutic change occurs over time. Many researchers agree that the process of change is an important focus, and that it is underrepresented in the literature (Kazdin, 2008; Lambert & Ogles, 2004; Wampold, 2001; Westen, et al., 2004). In fact, the predominant method of assessing treatment efficacy, randomized control trials, arguably obscures the processes of change (Borckhardt et al., 2008; Skinner, 1938).

In this study, a case-based time-series design was utilized to examine the early stages of psychodynamic psychotherapy with three patients diagnosed with Major Depressive Disorder (MDD). This design allows researchers to a) assess treatment effectiveness, b) analyze specific processes of change, c) uncover the trajectories of, and relationships between, individual symptoms, and d) test previous, proposed models of psychotherapy change.

Single-Case and Large-N Designs

Randomized control trials (RCTs) are currently the "gold standard" in psychotherapy outcome research. However, RCTs, and other large-*N* group designs, have received significant criticism of late (e.g., Morrison, Bradley, & Westen, 2003; Westen, Novotny & Thompson-Brenner, 2004). Case-based intervention research provides an alternative to large group designs. In addition, case-based research can generate new research questions that may lead to the development of more effective treatment options. Peterson (2004) speculates that case-based research might fill the gap in the current body of psychotherapy research, stating, "Databases grounded in the actual experiences practitioners encounter will provide a descriptive foundation for a science that suits the nature we are trying to comprehend" (p.205). Westen and Bradley (2005) discuss the merits of case-based research design, suggesting that psychotherapy researchers "would do well to use clinical practice as a natural laboratory for identifying promising treatment approaches" (p. 267). The way in which treatments are evaluated could benefit from the insight that can be gleaned from case-based research conducted in typical clinical settings.

Psychotherapy Process Models of Change

Howard, Kopta, Krause, and Orlinksy (1986) began conceptualizing psychotherapy, in terminology borrowed from pharmacology, as a dose-effect relationship. Their meta-analytic work on the dose-effect relationship of therapeutic change indicates that 29-38% of patients show improvement within the first three sessions, and 10-18% of patients can be expected to show some improvement even before the start of psychotherapy. While pre-treatment improvement findings may seem counter-intuitive, the authors attribute this effect to the patient feeling as though help is on the way after having made the first contact.

Other psychotherapy researchers have noted a "sudden gain" in the process of improvement, defining this phenomenon as a large symptom improvement in one between-session interval (Andrusyna, Luborsky, Pham, & Tang, 2006; Tang & DeRubeis, 1999; Tang, et al., 2007). Specifically, this large improvement is defined here as an increase of at least seven points on the Beck Depression Inventory (BDI), as measured immediately prior to each psychotherapy session. Studies addressing this "sudden gain" have found that the most rapid change occurs within the first three sessions and that the patients experiencing sudden gains early in treatment were less depressed at post-treatment than the non-sudden-gain patients and also at 18-month follow up (Tang & DeRubeis, 1999). The authors of the sudden gain literature conclude that this rapid, early improvement is not simply a measurement artifact, but an important and critical stage in the course of psychotherapy that may have implications for outcome and relapse (Tang & DeRubeis, 1999; Tang, et al., 2007). Andrusyna, et al. (2006) expanded the concept of sudden gains in cognitive therapy to various treatment modalities, such as Supportive-Expressive types of psychotherapy. The authors of this study conclude that sudden gains in various treatment modalities could be associated with different mechanism factors (such as cognitive changes in CBT and the interpretation accuracy and therapeutic alliance in Supportive-Expressive psychotherapy).

The Howard, et al. (1986; 1993; 1996) studies also show that 48-58% of patients improve within 4-7 sessions, 75% of patients improve after 26 sessions, and 85% of patients improve by the end of one year. When the patients are categorized by diagnosis, the point of effective exposure (i.e., the point in treatment where 50% of the patients show improvement) for individuals with mood disorders is between 8-13 sessions, for borderline-psychotic disorders, 13-

26 sessions. These findings have led to a more refined conceptualization of the phase model of change, which describes recovery as a stepwise process.

Howard, et al. (1993) posits that the first phase of therapeutic improvement unfolds first through a sense of overall well-being or *remoralization*, second through symptom change or *remediation*, and lastly through change in fundamental, systemic personality traits or functioning, referred to as *rehabilitation*. Fowler, et al. (2004) supported this phase model of change in psychotherapy, finding that improvement occurs in a 3-phase stepwise model: overall well-being, symptom relief, and then fundamental personality traits. Hersoug, Sexton and Hoglend (2002) report that the most rapid change occurs between session 1-20, and symptom change levels off after session 20. They conclude that a sense of well-being precedes symptom reduction, and symptom reduction precedes improvement in overall defensive functioning (Hersoug et al., 2002). Though subtly different, these proposed phase models each tap into a similar phenomenon: specific difficulties change at differing rates throughout psychotherapy, starting with the least complex (e.g., overall well-being) and ending with the most complex (e.g., characterological traits).

One limitation in the current body of psychotherapy change research is the absence of continuous measurement. The research just reviewed, collected very few observations across the entire course of often lengthy psychotherapy, making it nearly impossible to examine specific mechanisms of change. Whereas these studies draw conclusions about the trajectory and processes of change from relatively few measurement points, continuous measurement designs have the potential to more accurately and precisely illuminate important aspects of the psychotherapy change process.

Advantages of a Time-Series Design with Continuous Measures

By employing a time-series design with continuous daily measurements, the current study has certain advantages over previous process model research. One notable advantage of time-series design is that it simultaneously addresses effectiveness and process: 1) Does the patient get better? and 2) How does change unfold over time? (Borckhardt et al, 2008). A continuous or daily measures time-series design allows researchers to examine phase effects and individual patterns of symptom change. Another advantage to this design is that it highlights target symptoms for each patient. In the current study, the intake therapist and patient collaboratively identified variables to be measured on a daily basis that would signify real-world improvement to the patient and are, thus, easily translatable. Collecting continuous daily measures provides more robust data, allowing for a level of detail not otherwise available in the predominant large-*N* designs.

Methods

At intake, all non-emergent adult patients at the University of Tennessee Psychological Clinic complete a demographic questionnaire, self-report measures, and a symptom rating assessment. During a semi-structured clinical interview, patients also work with the intake therapist to identify symptoms that could be tracked on a daily basis to indicate improvement. Patients are then provided with Individual Daily Record Sheets (Figure 1) to complete each day (Figure 1 and all other figures can be found in Appendix A). Patients are also given informed consent procedures to participate in both the treatment and the research study. No incentive is given for research participation and patients are not recruited for inclusion in a research study. All participating patients report feelings of "Overall Distress" daily, as well as those specific symptoms determined during the intake session. Completed daily record sheets are returned at scheduled appointment times to the clinic secretary and entered into a database by undergraduate research assistants. Patients then receive weekly psychotherapy by student therapists in a clinical psychology doctoral program, who are supervised weekly by licensed clinical psychologists. This is an ongoing clinical research protocol, from which, the current study utilized a subset of patient data. (For a more detailed description of the research and clinical operations involved in this study, see Borckhardt et al, 2008.)

Patient Selection and Characteristics

From this large database, which consists of 108 patients whose data had been collected since 2004, all completed patient charts were examined. Patients were selected for the current study based on a diagnosis of MDD (Major Depressive Disorder) identified on the Treatment Plan, which is completed by the therapist within 30 days of beginning treatment. Diagnostic considerations are completed in concurrence with the supervising psychologist, who reviews

videotaped sessions of the patient and therapist on a weekly basis. MDD diagnosis was based on the criterion in the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision (DSM-IV-TR; American Psychiatric Association, 2000). Among the 22 charts thus identified, the following inclusion and exclusion criteria were applied: 1) no co-occurring Axis I diagnoses, 2) no co-occurring Axis II diagnoses, and 3) data had been collected for at least 8-15 sessions in order to test the findings of previous process models. Three charts satisfied the above criteria. Two of the patients are female, one is male, and their ages are 34, 42, and 54 respectively. Education levels include bachelors and master's degrees. One patient is single, two are divorced, and one patient has children.

Therapists and supervision. Within the training program's curriculum, the student therapists complete two advanced graduate-level psychotherapy courses. The treatment modality of these three cases can be broadly defined as psychodynamic. Although elements of related orientations (psychoanalytic, object-relations, etc.) may have been employed, the therapists and supervisors operate from a psychodynamic perspective. Treatment does not follow any specified protocol and does not utilize a treatment manual, meaning these cases are best classified as "outpatient treatment as usual." Since this study is entirely retrospective, I recognize the limitation of not being able to provide formal treatment integrity checks. However, since each student therapist receives ongoing, weekly supervision by psychodynamically oriented training faculty, I am able to postulate with reasonable certainty that the therapeutic approach being employed in these cases adheres to psychodynamic principles and techniques.

Research Design

The phase model of psychotherapy change (Fowler et al., 2004; Hersoug et al., 2002; Howard et al., 1993; Howard et al., 1996) suggests that improvement occurs in three phases

throughout treatment, starting with subjective well-being, followed by symptom improvement and then structural or characterological improvement. To test this model, a case-based time-series design was used to examine the early stages of psychodynamic psychotherapy with three patients presenting with Major Depressive Disorder (MDD). For each patient, daily measures of subjective well-being (as measured by "Overall Distress") and symptoms were collected and tracked over time. The completed data collection periods ranged from 9-13 sessions. This range fits with the above reviewed literature, which suggests 8-13 sessions is the optimal dose-effect for mood disorders (Howard et al; 1986, 1993, 1996) and that the most rapid change occurs within the first three sessions (Hersoug et al., 2002; Howard et al., 1986; Tang & DeRubeis, 1999). Because the current study examines MDD without co-morbid Axis II diagnoses and because the data streams do not continue beyond 9-13 sessions, no characterological or structural improvement was assessed.

To test this model for MDD, each data stream was broken down into three phases. The first phase (Phase A) is the pre-treatment baseline phase, which began after the initial intake session and continued until the first treatment session. The second phase (Phase B) is defined as all days between the first and fourth therapy sessions. By setting the endpoint for Phase B prior to session 4, all days affected by the first three sessions are included. The third phase (Phase C) varied for each patient in this study since data collection ceased at different times. For all cases, Phase C begins at session 4 and continues through session 9, 12, or 13, depending on the case.

Hypotheses

I hypothesize that the collected data will lend support to previous phase models of change described above (Fowler et al., 2004; Hersoug et al., 2002; Horowitz, Rosenberg, Baer, Ureno, & Villasenor, 1988; Howard et al., 1993). In order to determine if the daily ratings from the three

included depressed patients support a phase model of change, six conditions are tested each. Figure 2 illustrates the a priori phase model upon which the six conditions are based.

Condition 1. The level of Overall Distress will be more severe during the pretreatment baseline compared to the first three psychotherapy sessions. To test this condition, I compare Phase A with Phase B using a level-change or phase-effect analysis. For this condition to be considered "satisfied," a statistically significant phase effect (alpha value of 0.05) must be achieved.

Condition 2. The Overall Distress ratings during Phase B will be no different than the ratings during Phase C. Although some improvement in Overall Distress may occur after the fourth session, it is not expected to be significantly more rapid. This condition will be tested with a slope-change analysis. SMA provides 5 different a priori models of slope change. For this analysis, Slope Vector 4 is used, which predicts a linear stability between the two phases. This condition is considered satisfied if the strength of the correlation is significant at an alpha value of 0.05.

Condition 3. The rate of change for Symptom ratings during Phase A should not be significantly different than the rate of change Phase B. Again, Slope Vector 4 is used as an a priori model in SMA and determined significance using an alpha of 0.05.

Condition 4. Improvement in the severity of Symptom ratings will occur in Phase C. I test this condition by comparing the Symptom ratings prior to session 4 (Phase A and Phase B combined) to the symptom scores reported thereafter (Phase C). This condition is considered satisfied if a significant phase-effect is obtained (alpha value of 0.05).

Condition 5. The rate of improvement (slope) in Overall Distress is greater than the rate of Symptom change during Phase B. In order to test this condition, slope-change analysis is

conducted, comparing Overall Distress and Symptom ratings during Phase B only. I accomplish this analysis in SMA by dummy coding the variable strings of these two ratings in order to determine the fit to an a priori model of change. For this condition, Slope Vector 2 is used, which predicts that the first data stream (Symptom Change) is flat, while the second data stream (Overall Distress) increases. A negative correlation is expected in this condition, since decreases in the data indicate improvement. Satisfaction of this condition is determined using an alpha of 0.05.

Condition 6. Beginning with the 4th session (Phase C), the rate of improvement (slope) of Symptoms should be greater, or steeper, than the rate of improvement of Overall Distress. Similar to Condition 5, a slope-change analysis is conducted, comparing the two variable strings during Phase C. Slope Vector 2 is used for this analysis as well, with the expectation that Symptoms will improve linearly in comparison to a relatively flat slope for Overall Distress. Satisfaction was again determined using a standard alpha value of 0.05.

For each patient there are six dichotomous criteria. The phase model literature provides a theoretical framework, from which I predict a specific outcome for each of these six binomial criteria (each of the two possibilities have a 50% probability of occurrence). Thus, for each criterion either the theory-predicted outcome is consistent with theory (a "hit"), or it is not (a "miss"). If within one patient record there are six "hits" (all criteria satisfied) the probability of such an occurrence is 1/64, or .016, hence significant at our a priori alpha level of 0.05 (Siegel, 1956). Since each of the three patients has the possibility to satisfy or not satisfy six criteria each, there are a total of 18 conditions tested in the current study. Taking the three cases together, the probability of realizing 18 “hits” is .004, hence significant (Siegel, 1956). The least possible hits that could be realized while still remaining statistically significant at the 0.05 alpha

level is 13 of the 18 ($p = 0.046$; Siegel, 1956). Therefore, for our hypothesis to be supported, at least 13 of the 18 possible conditions must be satisfied.

Data Analytic Strategy

Time-series level and slope change analyses were conducted using Simulation Modeling Analysis (SMA; Borckardt, 2006) for time-series, which is a relatively new bootstrapping approach to assess the shorter data streams typically encountered in intervention research (Borckardt, et al., 2008). SMA also accounts for the autocorrelation, or non-independence of sequential observations, in the data stream. An effect size (Pearson's r) is then calculated, along with the actual probability of obtaining that effect, given the length of the data stream and its level of autocorrelation. Level-change or phase-effect analysis compares the mean scores of the two data streams. Significant effect sizes for level-change indicate significant improvement in the severity of the reported variable. Slope-change analysis in SMA compares the patient's daily reports with an a priori model of change, and determines the strength of the relationship between the two. Significantly correlated slope-change analyses suggest that the reported symptoms are related to the hypothesized course of improvement.

Missing values in the data streams were addressed using the EM (Expectation-Maximization) Algorithm (Dempster, Laird, & Rubin, 1977), a maximum likelihood estimation technique, which was found to be superior to other missing data methods, such as listwise deletion, mean substitution, and mean of adjacent observations (Velicer & Colby, 2005). Each case, and those variables within each case, varied on missing data ranging from 2.0% to 19.8%. These rates of missing values are similar to those found with other time-series cases conducted in a typical clinical, non laboratory setting (e.g., Smith, Handler, & Nash, under review; Smith, Wolf, Handler, & Nash, 2009).

Results

Preliminary Analyses

The current study examined the trajectories of two variables for each of the three patients: Overall Distress and Symptoms. However, it is important to note that each patient rated a number of case-specific symptoms that were deemed to be personally salient. Case 1 completed 9 sessions of once-weekly psychotherapy, spanning a time period of 91 days, 23 of which comprised the baseline period. The targeted symptoms for this individual were 1a) Overall Distress, 1b) Depressed Feelings, and 1c) Problems at Work. Case 2 completed 13 sessions of once-weekly psychotherapy, spanning a time period of 86 days with 18 days of baseline. This patient tracked 2a) Overall Distress, 2b) Depressed Feelings, 2c) Relationship Ambivalence, 2d) Ambivalence about Change, and 2e) Feelings of Self-Efficacy. Case 3 completed a total of 12 sessions spanning a time period of 117 days. The baseline period was the first 13 days. The targeted symptoms for this individual were 3a) Overall Distress, 3b) Feelings of Depression, 3c) Motivation to Self-Improve, and 3d) Difficulty Falling Asleep.

Cross-correlation analyses were first conducted in SPSS (SPSS for Mac, 2007) to determine the extent to which case-specific targeted symptoms were related to one another over the course of treatment. Cross-correlation analysis determines the degree to which two strings of variables are related to each other at a specified interval. All case-specific target symptoms were put on the same valence, so that a decrease indicated improvement, prior to running the analyses. Overall, case-specific target symptoms were most highly cross-correlated at lag 0, meaning that reports of one symptom were most strongly related to a second symptom on a day-to-day basis throughout the study period. This makes sense, considering that all of the case-specific symptoms come from the symptom constellation of MDD and were reported by the same person

at the same time each day. Cross-correlation statistics for Case 1 showed that the target symptoms were statistically significant at lag 0 ($r = 0.703$). Cross-correlation statistics for Case 2 showed that overall, the strongest relationship between the targeted symptoms was at lag 0, with a range from $r = 0.105$ to $r = 0.540$, yet not all pairs of symptom variables were statistically significant. Cross-correlation statistics for Case 3 showed statistically significant relationships among all targeted symptoms at lag 0, which was also the strongest relationship (range: $r = 0.374$ to $r = - 0.558$). This statistical evidence provides support for the creation of a composite "Symptom" variable comprised of each patients' targeted symptoms. Descriptive statistics of the Distress and Symptom variables are presented in Table 1 (Table 1 and all other tables can be found in Appendix B).

Phase Effects

While the current study examined the trajectory of Overall Distress and Symptoms in a detailed manner by looking at 6 conditions for each of 3 patients, it is also important to note whether or not there was any evidence to suggest a significant therapeutic effect for these patients. Any results found for each of the 18 conditions described above can be directly related to whether or not there was any significant change for the three cases. To examine the treatment effects for each of the three psychotherapy patients, a phase effect or level change analysis was conducted in SMA, comparing Phase A (baseline) to the combination of Phase B and Phase C (B+C=total treatment measured). Table 2 depicts the results of these analyses.

Case 1. Results of the phase effect analyses for Case 1 did not indicate a statistically significant decrease in either Overall Distress or Symptoms. However, each analysis yielded a moderate effect size (R= -0.222, R= -0.303), which may indicate a trend towards improvement,

regardless of the fact that p-values were higher than the standard .05 level (Carver, 1993; Cohen, 1977; Westen, et al., 2004).

Case 2. Results of the phase effect analyses for Case 2 did not indicate a statistically significant decrease in Overall Distress or Symptoms. In addition to not reaching a level of significant change, the results of the analyses for Case 2 did not yield particularly remarkable effect sizes.

Case 3. Results of the phase effect analyses for Case 3 indicated a statistically significant decrease in Symptoms (p=0.013), but not in Overall Distress.

Conditions

Condition 1. Condition 1 stated that the mean Overall Distress level of phase A should be greater than the mean Overall Distress level of Phase B. Of the three cases, Case 1 satisfied this condition ($r = 0.542$, $p = 0.049$). Neither Case 2 nor Case 3 met the specified criteria for this condition.

Condition 2. Condition 2 stated that, for Overall Distress, the slope of Phase B should not be significantly different than the slope of Phase C, as shown by a statistically significant correlation with Slope Vector 4 in SMA ($p < .05$). Case 1 satisfied this condition ($r = 0.407$, $p = 0.038$), while Case 2 and Case 3 did not.

Condition 3. Condition 3 stated that, for Symptoms, the slope of Phase A should not be significantly different than the slope of Phase B, as shown by a statistically significant correlation with Slope Vector 4 in SMA ($p < .05$). This was tested with slope change analyses in SMA. None of the three cases satisfied this condition.

Condition 4. Condition 4 stated that Symptoms should be greater, or more severe, in Phases A and B combined than in Phase C. This was tested with level change analyses in SMA. None of the cases satisfied this condition.

Condition 5. Condition 5 stated that within Phase B, Overall Distress should improve more quickly than Symptoms. This condition was tested with slope change analyses in SMA, comparing the slope of Overall Distress and Symptoms within Phase B. To satisfy this condition, the slope of Phase B Overall Distress must be greater (or steeper) than the slope of Phase B Symptoms, as indicated by a statistically significant correlation with Slope Vector 2 in SMA ($p < 0.05$). None of the cases satisfied this condition.

Condition 6. Condition 6 stated that within Phase C, Symptoms should improve more quickly than Overall Distress. This condition was tested with slope change analyses in SMA, comparing the slope of Overall Distress and Symptoms within Phase C. To satisfy this condition, the slope of Phase C Symptoms must be greater (or steeper) than the slope of Phase C Overall Distress, as indicated by a statistically significant correlation with Slope Vector 2 in SMA ($p < 0.05$). Cases 2 ($r = -0.491$, $p = 0.007$) and 3 ($r = -0.415$, $p = 0.002$) satisfied this condition, while Case 1 did not.

Comprehensive results of the 18 total conditions tested in this study are presented in Table 3.

Discussion

The current study examined the process of change in the early stages of psychodynamic psychotherapy for three individuals with Major Depressive Disorder (MDD). Using a time-series design with daily measures of overall distress and symptom severity, I was able to identify the ways in which each variable changed over time. Based on theory-based models of psychotherapy change (Fowler et al., 2004; Howard et al., 1986; Howard et al., 1993; Howard et al., 1996), each case was divided into three phases: a pretreatment baseline phase (Phase A), the period of time included in the first three sessions (Phase B), and the period of time from session 4 until the end of measured sessions, ranging from 9-13 sessions (Phase C). For each of the three patients, six conditions were specified that would provide support for the phase model of change in psychotherapy. Of those 18 possible conditions, 13 needed to be met in order to indicate statistically significant support, as opposed to chance occurrences. The results of this study were not consistent with the phase model of change as evidenced by only 4 of the possible 18 conditions being met.

Even though a uniform pattern of change was not found consistent with previous psychotherapy process models, the uniqueness of individual trajectories contributes to our understanding of the change process. The findings indicate that patients experience idiographic patterns of change compared to others of a similar age, presenting problem and therapeutic approach. By examining aggregate data, previous models of change seem to suggest that all patients follow a similar pattern while simultaneously failing to highlight individual trajectories. Shared patterns of change may indeed exist, but this study's findings suggest that change occurs idiosyncratically, at least early in treatment with this population.

By employing a time-series design, specific trajectories of change were identified over time, as opposed to a single outcome measure pre and post-treatment. In this way, time-series research affords the unique opportunity to examine the process of change in psychotherapy in addition to the outcome. Further examination of psychotherapy process is necessary in order to identify how and why change occurs over the course of treatment. Additionally, single-case research can bridge the gap between clinical work and research, simultaneously offering clinicians a statistical perspective on patient progress and allowing researchers to examine aspects of psychotherapy and psychopathology at a single-case level.

Limitations and Future Directions

While this study has certain methodological strengths in comparison to other psychotherapy process studies, it is important to highlight a few limitations and their implications. First, this study is a post-hoc replicated single-case design that examined the early stages of longer-term psychodynamic psychotherapy. For this reason, I was unable to identify and use certain details of treatment to describe and understanding each patient included in this study. Patient and diagnosis-specific characteristics such as chronicity of depression and social support may all factor heavily into the change process. Were those details better understood for the purposes of this study, they might have shed some light on the lack of significant change in the early stages of treatment. Additionally, because this study utilized archival data in a retrospective analysis of three psychotherapy patients, I was unable to identify the specific ways in which the therapists and supervisors diagnosed each patient with MDD. Protocol at the University of Tennessee Psychological Clinic indicates use of the DSM-IV-TR diagnostic criteria, yet because of the retrospective nature of this study, I was unable to *ensure* that the diagnoses were made with strict adherence to the DSM-IV-TR criteria. For this reason, it may

be more appropriate to consider these patients to be dysphoric or mood-disordered rather than clinically depressed specifically.

It is important to note that these cases were not intentionally short-term, as the data might suggest. Thus, the findings are presented cautiously, recognizing they may not be representative of the process of change in a complete, naturally terminated treatment. Since psychodynamic treatment is generally not a short-term treatment, besides some highly specified short-term psychodynamic therapies, and typically does not directly target symptom improvement early in therapy, it is not necessarily surprising that a high degree of symptom improvement was not found in this study. The lack of a significant effect could also be due to statistical power issues. Because these cases only included data from the early stages of treatment, number of observations (days measured) is relatively small for most variables measured in this study. With a smaller number of observations, it is more difficult to detect statistical significance.

Another limitation to the current study is the method in which target symptoms are identified. In conjunction with their intake therapists, the patients identify symptoms that are most important to them. The only shared target symptoms in the current study, prior to the creation of composite variables, were subjective well-being and feelings of depression. However, there may be some variables that apply to all patients and are important for change in psychotherapy that are not measured in this study. For instance, Case 2 listed Ambivalence about Change (2d) as a specific symptom to target in therapy. Ambivalence measures the patient's feelings about their preparedness to begin making changes in their lives, which is a common goal in all psychotherapy, regardless of diagnosis, and is likely to be a common dilemma for the majority of patients (Miller & Rollnick, 2002). The lack of uniformity in symptom change patterns may, in part, be due to the lack of uniformity in identified target symptoms.

Although the results of this study did not provide support for the hypothesized model of change, this study utilized a design and methodology that has the benefit of illuminating micro-level changes that previous studies have not been able to accomplish. These findings, albeit with a number of limitations, that patients experienced unique trajectories and processes of change indicates the need for future research to examine these processes. To address the limitations of this study, future research should consider including a higher number of shared symptom variables across cases, a longer treatment period, and the inclusion of variables that might be common to patients in psychotherapy in general. However, a forward-looking and larger-scale longitudinal study that addresses the current study's limitations could be designed with the same statistical methodology. In this way, the current study serves as a methodological template upon which future case-based studies of psychotherapy can be based.

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Appendix A

Table 1.

Descriptive Statistics of Distress and Composite Symptom Variables for Each Case

	Phase A		**Phase B**		**Phase C**		**A+B+C**		
	M	SD	M	SD	M	SD	M	SD	*pAR(lag1)*
Case 1	*N*= 23		*N*= 16		*N*= 52		*N*= 91		
Distress	2.856	0.814	2.000	0.365	2.532	0.957	2.521	0.883	0.511
Symptom	3.013	1.027	2.000	0.365	2.487	0.902	2.534	0.993	0.436
Case 2	*N*=18		*N*=21		*N*= 47		*N*=86		
Distress	5.389	1.577	5.667	1.592	6.074	1.584	5.831	1.591	0.313
Symptom	4.778	1.007	4.770	1.203	4.320	1.012	4.526	1.072	0.368
Case 3	*N*=13		*N*=19		*N*= 85		*N*=117		
Distress	7.136	0.869	6.790	1.843	6.686	1.736	6.752	1.675	0.368
Symptom	6.869	1.150	5.351	0.892	5.361	0.847	5.527	1.004	0.752

*Note: *pAR (lag1)* = autocorrelation reported for full data stream

Table 2. *Phase effect analyses for treatment effects by case*

	Phase A (Baseline)		**Phases B+C** (Treatment)			
	M	SD	M	SD	*r*	*p*
Case 1	*N*= 23		*N*= 68			
Overall Distress	2.856	0.814	2.407	0.876	-0.222	0.215
Symptoms	3.013	1.027	2.372	0.823	-0.303	0.066
Case 2	*N*= 18		*N*= 68			
Overall Distress	5.389	1.577	5.949	1.575	+0.144	0.351
Symptoms	4.778	1.007	4.459	1.078	-0.122	0.447
Case 3	*N*= 13		*N*= 104			
Overall Distress	7.136	0.869	6.704	1.739	-0.081	0.547
Symptoms	6.869	1.150	5.360	0.848	-0.475	0.013*

*Note: *r*= Pearson's R, *p*=p-value, statistically significant improvement marked by the (*)

Table 3.
Comprehensive Results of Time-Series Analyses and Satisfaction of Condition Criteria

	Case 1			**Case 2**			**Case 3**		
Condition	*r*	*p*	*Satisfied?*	*r*	*p*	*Satisfied?*	*r*	*p*	*Satisfied?*
1. Overall Distress: Phase A > Phase B	-0.542	0.049	Yes	0.089	0.665	No	-0.114	0.762	No
2. Overall Distress: Slope B not significantly different than Slope C	0.407	0.038	Yes	0.076	0.628	No	-0.181	0.190	No
3. Symptoms: Slope A not significantly different than Slope B	-0.472	0.086	No	-0.199	0.408	No	0.577	0.180	No
4. Symptoms: Phase A+B > Phase C	-0.060	0.715	No	-0.212	0.183	No	-0.271	0.257	No
5. Overall Distress slope Phase B > Symptoms slope Phase B	-0.083	0.671	No	0.136	0.462	No	0.428	0.145	No
6. Symptoms slope Phase C > Overall Distress slope Phase C	0.142	0.357	No	-0.491	0.007	Yes	-0.415	0.002	Yes

Note: *r*= Pearson's R, *p*= p-value

Appendix B

Please use the 1-9 scale below to rate each variable daily:

Not at all **moderately** **extremely**

1 2 3 4 5 6 7 8 9

(1) OVERALL DISTRESS: (this is a *general* rating of how distressed you felt)

Sun-1/1/00	Mon-1/2/00	Tue-1/3/00	Wed-1/4/00	Thur-1/5/00	Fri-1/6/00	Sat-1/7/00

(2) DEPRESSED FEELINGS

Sun-1/1/00	Mon-1/2/00	Tue-1/3/00	Wed-1/4/00	Thur-1/5/00	Fri-1/6/00	Sat-1/7/00

(3) RELATIONSHIP AMBIVALENCE

Sun-1/1/00	Mon-1/2/00	Tue-1/3/00	Wed-1/4/00	Thur-1/5/00	Fri-1/6/00	Sat-1/7/00

(4) AMBIVALENVE ABOUT CHANGE

Sun-1/1/00	Mon-1/2/00	Tue-1/3/00	Wed-1/4/00	Thur-1/5/00	Fri-1/6/00	Sat-1/7/00

(5) FEELINGS OF SELF-EFFICACY

Sun-1/1/00	Mon-1/2/00	Tue-1/3/00	Wed-1/4/00	Thur-1/5/00	Fri-1/6/00	Sat-1/7/00

Figure 1
Daily Record Sheet for Case 2

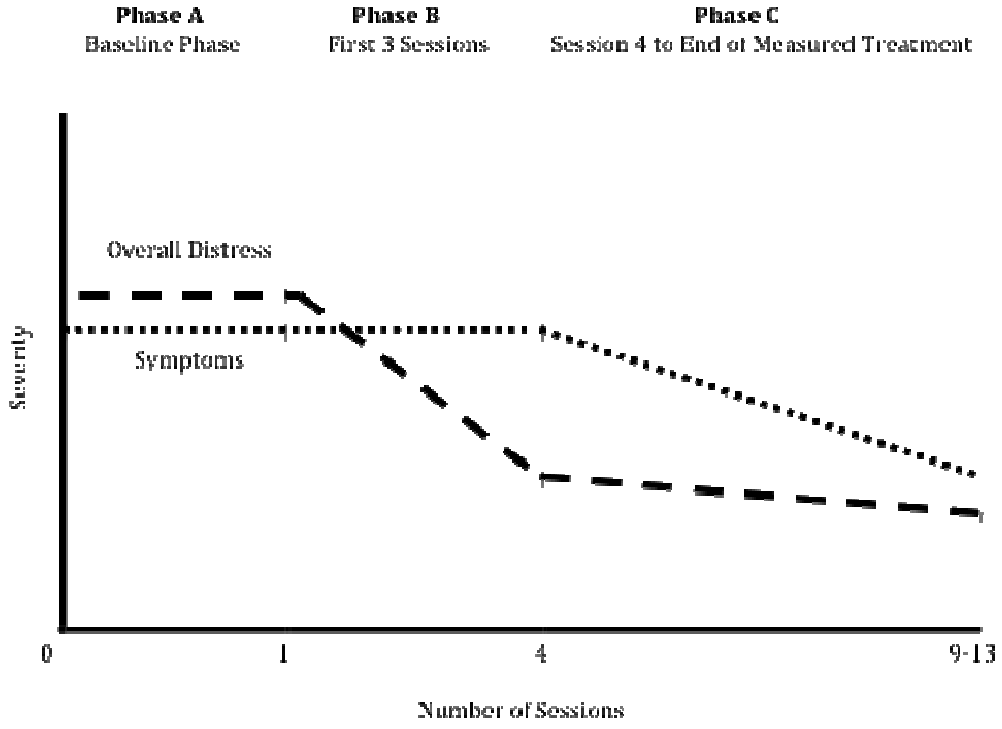

Figure 2.
A Priori Model of Expected Process of Change Based on the Phase Model

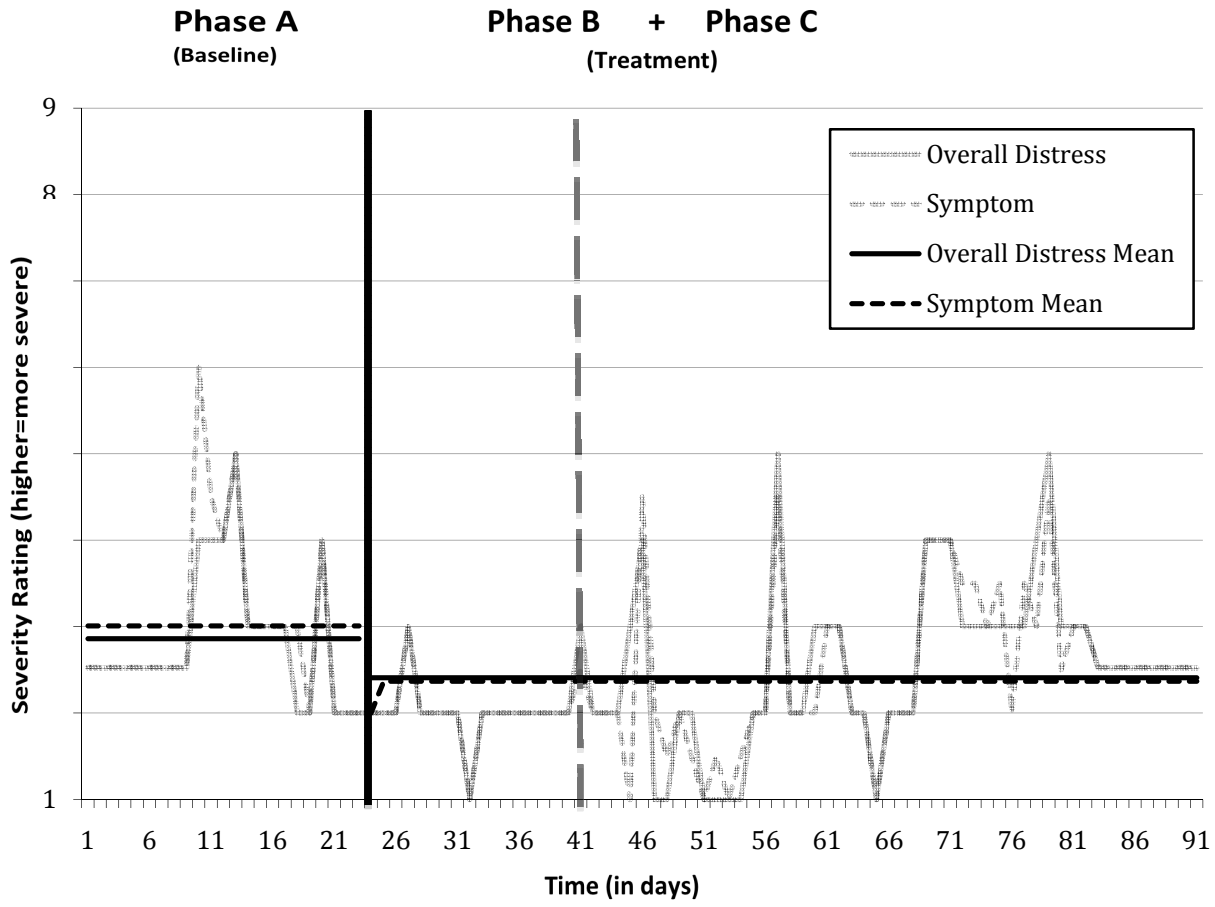

Figure 3. *Treatment effects for Case 1*

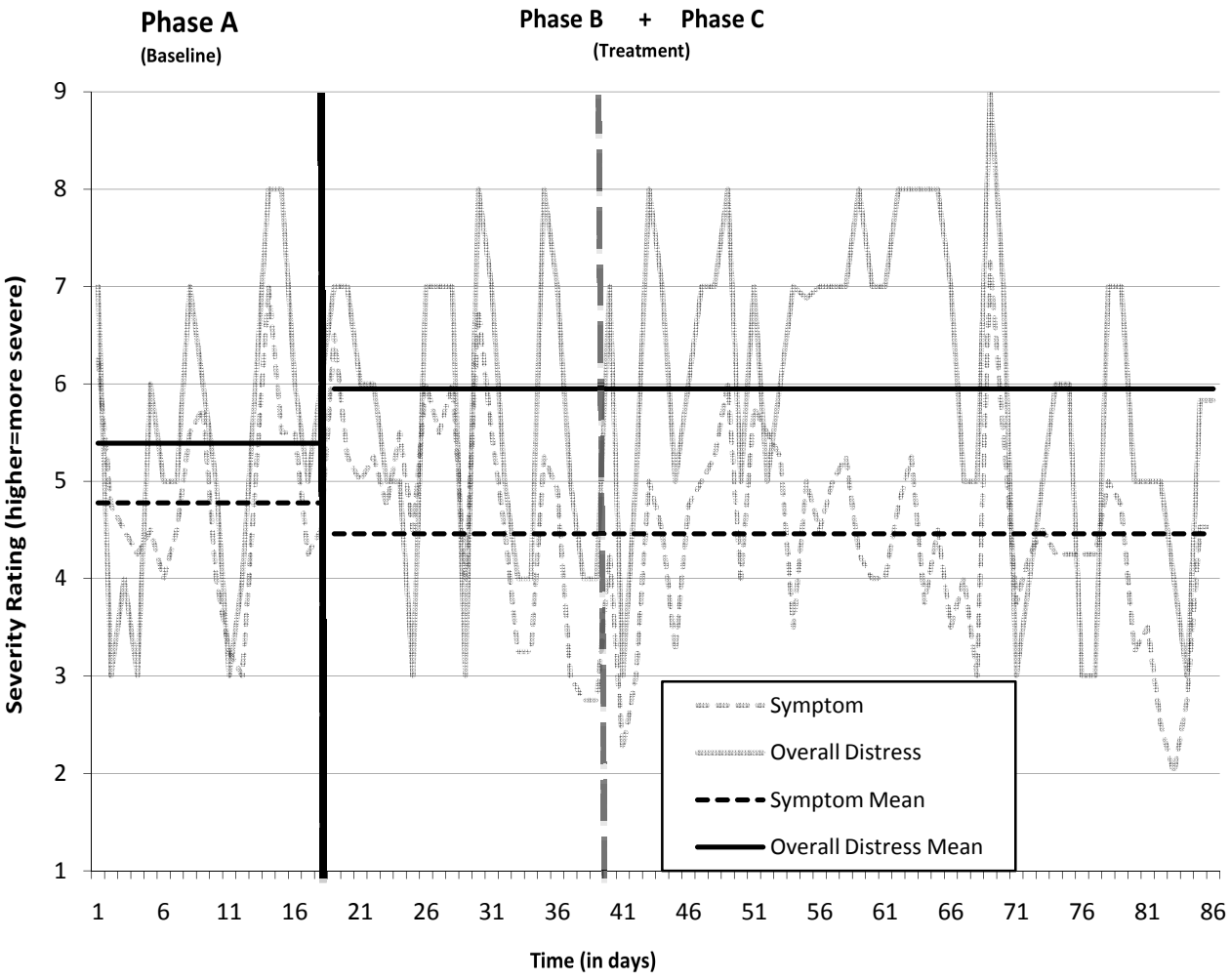

Figure 4. *Treatment effects for Case 2*

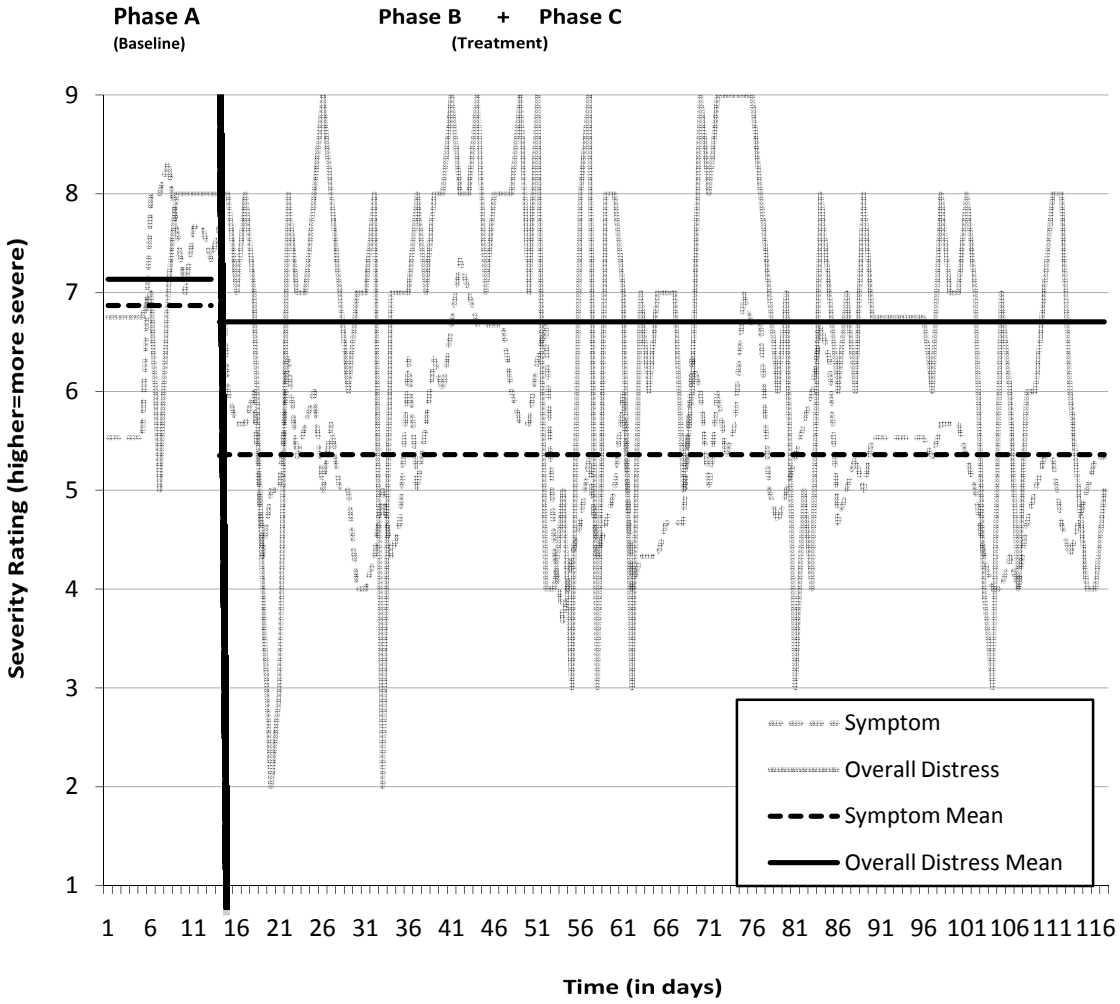

Figure 5. *Treatment effects for Case 3*

Vita

Erin I. Gray was born in Easton, PA in 1986. She attended high school and college in Pennsylvania, earning a B.A. in Psychology from The Pennsylvania State University in 2008. At Penn State, she had the pleasure of working with Dr. Kenneth N. Levy and Dr. Louis Castonguay on their psychotherapy and psychopathology research. In the spring of 2008, Erin began her graduate career at the University of Tennessee, where she works with Dr. Michael R. Nash. Erin is interested in psychotherapy process research, and she is actively building her knowledge and skills of the clinical applications of psychology in the practice of psychotherapy.