A META-ANALYTIC REVIEW OF FUNCTIONAL ANALYTIC PSYCHOTHERAPY SINGLE-SUBJECT RESEARCH

Rajinder Jitkaur Singh

A Thesis
Submitted to the Graduate College of Bowling Green State University in partial fulfillment of the requirements for the degree of

MASTER OF ARTS

May 2016

Committee:
William O'Brien, Advisor
Harold Rosenberg
Clare Barratt
ABSTRACT

William O’Bien, Advisor

Functional Analytic Psychotherapy (FAP) is a contextual behavior therapy that utilizes basic behavior principles to implement change inside of session with the idea that it will generalize outside of session. The therapist focuses on punishing problematic behavior (CRB1s) in session and reinforcing more adaptive behavior (CRB2s). The FAP therapist uses the five rules of FAP in order to guide therapy sessions. Although FAP has existed as a therapy for over two decades, there is a limited amount of research examining its efficacy, and the majority of FAP efficacy studies used single-subject data. Although the research on the efficacy of FAP is sparse, some consider single-subject data to be one of the initial steps in developing evidence-based practices (Horner et al. 2005). The current study aimed to synthesize data from FAP single-subject design research in order to provide a quantitative estimate of its efficacy. The results indicated there is variation in demographics of participants, and overall effect sizes for this meta-analysis fell in the “moderately effective” to “fairly effective” range or were considered “significant” depending on the metric used. Overall the results indicate the efficacy of FAP is promising, but there is a need for research with stronger methodology.
ACKNOWLEDGMENTS

I would like to thank my committee members, Dr. William H. O’Brien, Dr. Harold Rosenberg, and Dr. Clare Barratt for their support, encouragement, guidance, and advice for this study. I would also like to thank Jessica B. Walter and Cassandra Baker for their assistance in the coding and rating process.
TABLE OF CONTENTS

CHAPTER I. INTRODUCTION ........................................................................................................ 1
  Efficacy of FAP .................................................................................................................. 2
  Meta-analysis of Single-Subject Research ......................................................................... 3
  Summary and Aims of the Present Investigation .................................................................. 11

CHAPTER II. METHOD ............................................................................................................. 13
  Selection Criteria ................................................................................................................ 13
  Article Coding ...................................................................................................................... 13
  Effect Size Calculation ......................................................................................................... 13
    Percentage of Non-Overlapping Data and Split Middle Trend Estimation .................. 13
    Reliable Change Index ...................................................................................................... 15
  Effect Size Aggregation and Analysis .................................................................................. 15

CHAPTER III. RESULTS .......................................................................................................... 17
  Methodological Characteristics of Studies .......................................................................... 17
    Participant Characteristics ............................................................................................... 17
    Targets of Treatment ....................................................................................................... 18
    Intervention Characteristics and Study Design ............................................................... 18
  Analysis of Effect Sizes .................................................................................................... 18
    Participant Characteristics and Outcomes .......................................................................... 19
    Treatment Targets and Outcomes .................................................................................... 20
    Intervention Characteristics and Outcomes ........................................................................ 20

CHAPTER IV. DISCUSSION .................................................................................................... 22
# LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Brief description of studies used in meta-analysis</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Brief description of studies used in meta-analysis</td>
<td>44</td>
</tr>
<tr>
<td>2</td>
<td>Description of CRB1s and CRB2s per study</td>
<td>46</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Example of PND for Participant X</td>
<td>48</td>
</tr>
<tr>
<td>2</td>
<td>Example of PND for Participant Y</td>
<td>49</td>
</tr>
<tr>
<td>3</td>
<td>Example of SMTE for Participant X</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Review of the Literature</td>
<td>51</td>
</tr>
</tbody>
</table>
CHAPTER I. INTRODUCTION

Functional Analytic Psychotherapy (FAP) was first introduced by Kohlenberg in 1987 in a book chapter discussing cognitive and behavioral therapies then elaborated on in 1991 by the release of a full book (Kohlenberg & Tsai, 1991). FAP is a contextual behavior psychotherapy based on the principles of radical behaviorism (Tsai et al., 2009). FAP proposes that the behaviors clients exhibit in sessions with a therapist are an index of adaptive and problem behaviors that clients display in other natural environments. These in-session behaviors are referred to as Clinically Relevant Behaviors (CRBs). CRBs divided into three categories: CRB1s are problematic behaviors, CRB2s are adaptive behaviors, and CRB3 are the client’s descriptions of his or her behavior and their functions.

In FAP, the therapist is encouraged to use behavioral principles to promote in-session changes in CRB1s, CRB2s, and CRB3s. This is accomplished by punishing CRB1s while simultaneously shaping and reinforcing CRB2s (Tsai et al., 2009). In order to do this effectively, the FAP therapist is trained to be aware of CRBs and techniques that can be used to modify the occurrence of CRB1s and CRB2s.

FAP utilizes a system of “five rules” to guide the therapist: (a) watch for CRBs; (b) evoke CRBs; (c) reinforce CRB2s; (d) assess therapist impact on client behavior; and (e) evaluate and generalize (Tsai et al., 2009). “Watch for CRBs” means that the therapist should consider the form and function of the client’s behavior during the therapy session. For example, if a client presents with the complaint of “self-esteem issues,” the therapist would monitor how and when these behaviors occur during the session. The second rule, evoke CRBs, means that the therapist should either state or engage in actions that will cause the client to generate CRB1s or CRB2s. In the example of the client with self-esteem problems, the therapist could ask the client
determine the session agenda. This would give the client an opportunity to exhibit a CRB2 of asserting her needs (e.g. “I would like to talk about X”) or a CRB1 (e.g. “We can talk about whatever you would like to talk about”).

The third rule directs the therapist to respond to CRB2s in a naturally reinforcing manner. For example, the therapist might say, “It makes me so happy and proud to see you taking charge and putting yourself first.” The fourth rule is to evaluate the extent to which the therapist’s interventions modify client behavior. This can be measured through therapist queries (e.g. “What was it like hearing me say that I felt proud of you”) and observation of increases or decreases in CRB1s and CRB2 as the sessions continue.

The final rule is to evaluate and generalize. Here the FAP therapist evaluates the interactions that occurred in-session and suggest that the client attempt similar interactions in other settings. An example of this might be the therapist stating, “I wonder what it would be like to assert yourself with your co-worker the way you just did in here. I bet it would make you feel more heard at work.” In this example the therapist is providing a suggestion to move the interactions from therapy to another interpersonal area in the client’s life where it may also be functional to engage in this behavior. This is the final step in the FAP interaction and is often called the “in-to-out” parallel and moves the process from inside of session to outside of session.

**Efficacy of FAP**

Several FAP theorists, clinicians, and researchers believe that FAP may be useful as a stand-alone therapy. However, the empirical evidence to support the usefulness of FAP as a stand-alone therapy is limited (Hayes, Masuda, Bisset, Luoma, & Guerror, 2005). Mangabeira, Kanter, and Del Prette (2012) conducted a qualitative review of FAP publications from 1990 to 2010. The authors reported that the majority of articles written about FAP were conceptual rather
than empirical. Further, their analysis of the empirical studies indicated that a majority used single-subject data or were uncontrolled case studies. Finally, the authors also noted that a number of these single-subject studies did not include statistics or graphical interpretation of treatment effects.

Öst (2008) conducted a meta-analysis of “contextual behavior therapies” including FAP, Acceptance and Commitment Therapy, Dialectical Behavior Therapy, Cognitive Behavioral Analysis System of Psychotherapy, and Integrative Behavioral Couple Therapy. He noted that FAP did not have any randomized control trials and therefore he could not include it in his analyses. Corrigan (2001) also noted the lack of randomized control trials and criticized FAP for making claims of efficacy without empirical evidence. Finally, Garcia (2008) concluded that there is very little use of quantitative analyses to evaluate FAP outcomes.

In summary, FAP is a contextual behavior therapy that applies basic behavioral principles to the therapeutic relationship in order to promote in session change. FAP utilizes five rules in order to decrease problematic behavior (CRB1s) and increase more appropriate behavior (CRB2s). The empirical evidence examining FAP is limited. Currently, there are no published randomized control trials that have evaluated the efficacy of FAP. However, a number of single-subject studies have been published. To date, reviews of FAP research have used only qualitative methods.

**Meta-analysis of Single-Subject Research**

Single-subject research has been conducted in the fields of school psychology, speech–language pathology, special education, education, early intervention, and applied behavior analysis (Barlow, Nock, & Hersen, 2009; Horner et al., 2005; Kazdin, 1982; Kennedy, 2005). Proponents of single-subject research argue that it is one of the initial steps in identifying
evidence-based practices (Horner et al., 2005). Additionally, when designed appropriately, single-subject research can show a causal relationship between interventions and outcomes (Kazdin, 1982). Another advantage of single-subject research is that it can be used to examine unique and/or rare phenomena as well as idiosyncratic responses to interventions across individuals (Kazdin, 1982). Importantly, single-subject data can be quantitatively synthesized through specialized meta-analytic techniques.

Meta-analysis is designed to aggregate and analyze quantitative findings from multiple studies. Most often, meta-analytic techniques are used to summarize statistical data and effect sizes from samples of participants. Single-subject studies do not generate sample-level data and therefore cannot be included in traditional meta-analyses. However, researchers have developed several ways to synthesize single-subject data. Among the most popular methods of synthesizing single-subject data are standardized mean difference (Busk & Serlin, 1992), Swanson’s $d$ (Swanson, Hoskyn, & Lee, 1999), interrupted time series analysis (Gottman, 1981), and percentage of non-overlapping data (PND; Scruggs, Mastropieri, & Casto, 1987). Each of these are described next.

The standardized mean difference for single-subject data (Busk & Serlin, 1992) was developed to create a small-n counterpart to the large-n standardized mean difference used in traditional meta-analysis. The large-n standardized mean difference is calculated by subtracting the mean of the treatment group from the mean of the control group and dividing the difference by the population standard deviation. The standardized mean difference for single-subject studies uses a similar approach. In this case, the mean of the baseline phase for an individual subject is subtracted from the mean of the treatment phase for that subject. The resulting difference score is then divided by the standard deviation of the baseline and treatment phase
data for that subject. These standardized mean differences are then aggregated across single-subject studies by calculating the mean of the individual standardized mean differences.

Because the single-subject standardized mean difference is similar to the large-n standardized mean difference, it is both familiar and more easily interpretable to researchers. A limitation of the single-subject standardized mean difference is that specific data point values are required to calculate it, and these data are rarely provided in graphs.

Swanson et al., (1999) developed $d_{sw}$ in order to generate an effect size from single-subject research based on Cohen’s $d$ (typically used in large $n$ meta-analysis). Swanson’s $d_{sw}$ is calculated in three steps. First, the mean of the last three treatment data points is subtracted from the mean of the last three baseline data points. Second, this difference score is then divided by the pooled standard deviation of the treatment and baseline data points to produce a standardized mean difference score based on these six data points (i.e. three baseline and three treatment phase data points). Swanson argued that this standardized mean difference will be inflated if there is a correlation between baseline and treatment data. Therefore, he argued that the standardized mean difference score should be multiplied by $\sqrt{2(1-r)}$ in which $r$ is the correlation between baseline and treatment data. This method of calculating effect sizes has been used in single-subject studies of individuals with learning disabilities and studies of working and long-term memory (Swanson & Sachse-Lee, 2000; Swanson et al., 1999; Swanson, Zheng, & Jerman, 2009).

An advantage of Swanson’s $d_{sw}$ is that it avoids the influence of trends which are sometimes encountered when comparing the means of entire phases of a study. For example, if data values across the entire baseline phase are increasing in a linear fashion (as a function of regression to the mean or some other non-intervention variable such as self-monitoring or
observation effects), then the overall mean will be lower than the final three data points. When calculating effect sizes, the overall mean would thus yield a larger value relative to the effect size generated by using the final three data baseline points. A disadvantage to this approach is that specific values are needed to calculate means and standard deviations. However, as noted earlier, single-subject studies do not often present graphs with specific values.

Interrupted time-series analysis (ITSA: Gottman, 1981) controls for autocorrelation and uses a $t$ test to evaluate the magnitude of change across phases in single-subject data. ITSA has been used in single-subject studies examining the effectiveness of hypnosis for diurnal enuresis (Iglesias & Iglesias, 2008), health technology assessment (Ramsay, Matowe, Grilli, Grimshaw, & Thomas, 2003), and psychotherapy (Borckardt et al., 2008). It begins by estimating the model and then removing slope by finding the difference of the data an appropriate number of times. Then, ITSA determines the least squares estimates of the autoregressive and moving-average parameters and then subtracts from the original scores in order to remove autocorrelation. Finally, this technique uses general linear modeling and the appropriate $t$ tests to determine whether the uncorrelated scores from post-assessment are significantly different in level or slope from the pre-assessment scores. Data are aggregated by calculating effect size for each dependent variable in the study then finding the average for all effect sizes.

ITSA has been used in meta-analyses of single-subject studies examining aphasia (Robey, Schultz, Crawford, & Sinner, 1999) and parent training (Maughan, 2004). The advantage of this approach is that it can be used to calculate the independent effects of level, trend, and autocorrelation. A disadvantage of ITSA is that raw data points are necessary to calculate ITSA, and studies do not often provide raw data.
Percentage of Non-overlapping Data (PND) is a non-parametric method used to calculate single-subject effect sizes. The PND is calculated by identifying a point in the baseline phase of the study that is relevant to the hypothesis under investigation and then calculating the percentage of treatment phase data that are either above or below the baseline point. For example, if the researcher predicts that an increase in behavior will occur as a function of treatment, then the highest point in the baseline phase is identified. Next, the researcher will calculate the percentage of treatment phase data points that are greater than the highest baseline data point. Alternatively, if the researcher predicts that a decrease in behavior will occur as a function of treatment, then the lowest point in the baseline phase is identified. Following this, the researcher calculates the percentage of data points in the treatment phase that fall below the lowest baseline data point.

For example, Singh and O’Brien (2015) used the PND to evaluate the effectiveness of FAP for three nursing home residents. Figures 1 and 2 present data of two participants treated with FAP in the study. Participants in this study were exposed to two weeks of baseline through supportive listening then four weeks of Functional Analytic Psychotherapy (FAP) to target specific CRB1s and CRB2s. Recordings of the therapy sessions were transcribed then coded to identify the occurrence of CRB1s and CRB2s in session. It was predicted that CRB1s would decrease and CRB2s would increase for both participants during the treatment phase.

Figure 1 presents Participant X’s CRB1 and CRB2 data. Singh and O’Brien (2015) calculated PND for this participant by identifying the lowest baseline point for the CRB1. This point is highlighted in yellow on the figure. Once the lowest baseline point was identified, Singh and O’Brien (2015) identified how many points in the treatment phase fell below the lowest baseline point of the CRB1. The authors found that 1 out of 4 total treatment points were below
the lowest baseline point and concluded that the intervention to decrease CRB1s produced a 25% reduction in the CRB1. In order to calculate PND for change in the CRB2, the authors identified the highest baseline point, which is also highlighted in yellow. Four out of four CRB2 points in the treatment phase were above the highest baseline point indicating that treatment produced a 100% increase in the CRB2 for this participant.

Figure 2 represents Participant Y’s CRB1 and CRB2 data. PND was calculated in the same manner as Participant X and the lowest point of the CRB1 and highest point of CRB2 are highlighted in yellow. In this case, the PND showed that 100% of the treatment phase CRB1 data points were below the lowest baseline point. Additionally, 100% of the treatment phase CRB2 data points were above the highest baseline CRB2 point.

PND has been cited to be an effective method for synthesizing single-subject research. For example, Schlosser, Lee, & Wendt (2008) concluded PND is an appropriate method of synthesizing data because it can be produced reliably across coders and can be calculated from many different types of single-subject studies. Additionally, Scruggs and Mastropieri (2013) reviewed the use of PND and concluded that it is a valid way to measure and describe the effectiveness of single-subject research.

A key advantage of PND is that it does not require specific graph values to calculate. Additionally, PND does not require a large number of values in each phase to calculate. Regarding disadvantages, Faith, Allison, and Gorman (1996) pointed out that PND could be misleading if there are baseline outliers.

The split-middle trend of estimation (SMTE: White, 1974) can be used to when there are outliers in single subject data. The split-middle trend of estimation is calculated by finding the median level of the dependent variable at the first half and second half of the baseline phase.
Once these two points are identified split-middle “celeration line” is drawn by connecting the two median points. This celeration line is extended into the treatment phase. If data in the treatment phase have similar values to those occurring in the baseline phase, the celeration line will divide the upper and lower values into equal proportions (Kazdin, 1982). If the values of the treatment phases are different from the baseline phase, then the proportion of data points above and below the celeration line will be unequal. The greater the inequality of the proportions above or below the celeration, the greater treatment effects (Kazin, 1982).

Figure 3 provides an example of how to calculate the split-middle trend of estimation. In this example, there are four points in the baseline phase. The baseline phase is divided in half as illustrated by the red dashed line. The median of both halves is identified on the x-axis and y-axis and this is illustrated by the black dashed lines. A line is drawn to connect the medians of the baseline points and this line extends into the treatment phase, which is represented by the orange dashed line. This line is referred to as the celeration line and the amount of points in the treatment phase above the celeration line are divided by the total amount of treatment points then stated as a ratio (Kazin, 1982). In this case, there are four points out of a total of seven treatment points above the celeration line so the ratio would be 0.5714. In order to better compare the ratio with PND, it was then converted to a percentage equaling 57.14%. An advantage of using split-middle trend estimation is that it is not affected by extremes in baseline. However, a disadvantage is that some data may not be well described by linear trends.

In addition to the aforementioned methods, the Reliable Change Index is a well-known method that it is appropriate for calculating clinical significance in single-subject studies that provide data on measures (typically questionnaires) that are collected at a single pre-treatment point in baseline and a single point after the conclusion of treatment (Jacobson & Truax, 1991).
In order to calculate a RCI, a participant’s pre-treatment score on a measure is subtracted from the post-treatment score then divided by the standard difference. The standard difference is the square root of the standard error of measurement. The standard error of measurement provides information related to the distribution of measurement error in the sample and found by multiplying the standard deviation of the measure by the square root of 1 minus the reliability coefficient of the measure. Jacobson and Truax (1991) argued that a RCI of 1.96 or greater could be thought of as statistically significant.

The RCI has been used to examine individual change in research examining cognitive-behavioral therapy, (Littleton, Buck, Rosman, & Grills-Taquechel, 2012; Oei & McAlinden, 2014), acceptance and mindfulness based therapies (Alonso, Lopez, Losada, & Gonzalez, 2012; Thornton et al., 2014), emotion-focused therapy (Angus & Kagan, 2013; Paivio, Jarry, Chagigiorgis, Hall, & Ralston, 2010), and exposure-based treatments (Haaland et al., 2011; Labrecque, Marchand, Dugas, & Letarte, 2007; Rosqvist, Thomas, & Egan, 2002) to name a few. An advantage of using the RCI is that it is an understandable, common metric across measures and participants. One disadvantage of the RCI is that popular statistical packages do not compute it, so it must be computed manually. Another disadvantage is that the RCI requires the acquisition of population means, standard deviations, and the reliability statistics of the measures used (Zahra & Hedge, 2010).

In summary, there are several techniques to that can be used to synthesize single-subject research including standardized mean difference, Swanson’s $d_{sw}$, ITSA, PND, and RCI. Standardized mean difference is easily understandable to those familiar with the large-n standardized mean difference. However, it requires specific data points for calculation. Swanson’s $d_{sw}$ accounts for the possibility of trends in data by comparing only the last three
points of the treatment and baseline phases. But, it also requires specific values to calculate means and standard deviation of participants. ITSA can be used to calculate the effects of level, trend, and autocorrelation in data, but it requires raw data to calculate that is not often provided in studies. PND does not require a large number of values or specific values to calculate, but it can be misleading if outliers exist in the baseline phase. SMTE also does not require a large number of data points or specific values to calculate. However, SMTE is less affected by outliers during the baseline period. Finally, RCI can be used to generate a common metric across measures, but can be tedious due to the need of acquiring population means, standard deviations, and the reliability statistics of the measures used.

As noted earlier there are a number of single-subject studies that examined the efficacy of FAP. A review of these studies indicates that data are typically presented in graphical format and that specific values are rarely provided. Thus, ITSA and Swansons dsw would not be suitable for synthesizing data in the current study. Additionally, pre-treatment and post-treatment questionnaires are often administered and reported FAP studies. Given these characteristics of single-subject data in FAP research, PND, SMTE, and RCI were determined to be the most workable ways to synthesize findings.

**Summary and Aims of the Present Investigation**

FAP is a contextual behavior therapy that applies behavioral principles to the interpersonal relationship between therapist and client. The therapy uses five rules to guide interactions between therapist and client that are designed to promote adaptive behavior change. Given that FAP has primarily been evaluated with single-subject studies and that reviews of FAP are qualitative, there is a need to better understand the effectiveness of this therapy using a quantitative approach. An examination of single-subject meta-analytic techniques indicated
that PND, SMTE, and RCI were well suited for aggregating data from FAP studies. There are
two principal aims of the current study. First, a methodological review of the current FAP
single-subject studies was conducted. This included reviewing the demographics of participants,
length of treatment, and method of type of FAP therapy provided. Second, PND, SMTE, and
RCI were used to calculate effect sizes in order to gain a better understanding of the effects of
FAP and whether the effectiveness of FAP varied as a function of participant characteristics,
length of treatment, or type of FAP.
CHAPTER II. METHOD

Selection Criteria

Several databases were used to find articles for the current study including PsycINFO (1872 to present), Psychology and Behavioral Sciences Collection (1930s to present), and ERIC (1966 to present). The following search terms were used: Functional Analytic Psychotherapy, FAP treatment, FAP single-subject design, FAP single-case design, and FAP case study.

To be included in this study, articles had to meet the following criteria: (a) the study used single-subject methods, (b) a FAP based treatment was provided, (b) the study contained data that could be coded (graphs, pre- and post-measures), and (c) the study was published in a peer reviewed journal or doctoral dissertation. The first author also solicited several list-services related to FAP to receive unpublished manuscripts that were appropriate for the current study. Studies that met these inclusion criteria were then reviewed for the meta-analysis.

Article Coding

Each qualifying article was examined and coded for the following information: number of participants, age, gender, ethnicity, FAP-related self-report measures, self-report measures of psychological wellness (i.e. Beck Depression Inventory, Symptom Checklist-90), number of treatment sessions, length of treatment, relevant treatment statistics (pre- and post-assessments) and graphical representation of treatment.

The first author and trained assistants coded articles using a meta-analysis coding form (See Appendix A). Disagreements that occurred between raters were resolved through consensus.

Effect Size Calculation

Percentage of Non-Overlapping Data and Split Middle Trend Estimation. When a graph presented behaviors targeted for reduction during treatment (i.e. CRB1), then the
researcher identified the lowest data point that occurred during the baseline phase of the study. Next, the researcher determined how many data points in the treatment phase fell below the lowest baseline point. Finally, the researcher calculated the PND by dividing the total number of points below the lowest baseline point by the total number of interventions points and multiplying the result by 100.

When a graph presented behaviors targeted for increases during treatment (i.e. CRB2), the researcher identified the highest data point that occurred during the baseline phase of the study. Next, the researcher determined how many data points in the treatment phase fell above the highest baseline point. Then, the researcher calculated the PND by dividing the total number of points above the highest baseline point by the total number of interventions points and multiplying the result by 100.

Following Scruggs and Mastropieri’s (1998) recommendations, PND scores were classified as follows: PND < 50%: unreliable treatment; PND 50% – 70%: questionable effectiveness; PND 70 – 90% fairly effective; and PND > 90%: highly effective.

Split-middle trend of estimation was calculated in four steps: (a) Divide the baseline phase into halves, (b) identify the median point on the y-axis in each half of the baseline phase, (c) draw a straight line connecting the median points of each baseline half and extend the line into the treatment phase, and (d) count the number of data points in the treatment phase that fall above or below this line (If the treatment target was a CRB1, the number falling below the line were counted. If the treatment target was a CRB2, the number falling above the line were counted). The proportion of data points above or below the celebration line were converted into a percentage so that they could be compared to the PND.
**Reliable Change Index.** Another method used to assess significant changes in single-subject studies was the calculation of Reliable Change Index scores (RCI). The RCI is a standardized score used to assess change in an individual’s score on a test and uses the participant’s pre- and post-treatment scores, standard deviation, and reliability coefficients. Given that the studies had small sample sizes, standard deviation, and reliability coefficients from validation studies were used to calculate RCIs for each measure. The formulas for calculating RCI and standard difference are provided below.

\[
RC = \frac{X_2 - X_1}{S_{diff}} \\
S_{diff} = \sqrt{2(S_E)^2} \\
S_E = SD\sqrt{(1-r)}
\]

In the above formulas, \(X_2\) is the post-treatment score, and \(X_1\) is pre-treatment score. The standard difference (Sdiff) is the square root of the standard error of measurement (S_E) squared and multiplied by two. The standard error of measurement is the standard deviation multiplied by the square root of 1 minus the reliability coefficient for a particular measure.

If the RCI was 1.96 or greater, the difference is classified as “statistically significant.” If the RCI was less than 1.96, then it is classified as “not statistically significant.” Individual RCI scores were aggregated by calculating an overall mean RCI for all single-subject studies included in the current study. Variation in RCIs were evaluated by comparing differences according to gender, length of treatment, type of disorder treated, and stand-alone FAP versus FAP-enhanced therapy.

**Effect Size Aggregation and Analysis**

Graphed data for each CRB1 and CRB2 were converted to PNDs and SMTE percentages. A RCI score was calculated for each self-report inventory for each participant where pre- and post-treatment data were provided. In studies where multiple CRB1, CRB2, or questionnaires
were collected on a single participant, an average PND, SMTE, and RCI were calculated for that participant.

An average PND, SMTE, and RCI was calculated across studies in order to generate an overall mean and standard deviation. Follow-up analyses were then conducted to determine whether there were significant differences in outcomes due to participant characteristics, targets of treatment, or intervention characteristics.
CHAPTER III. RESULTS

Using the search term “Functional Analytic Psychotherapy,” 133 studies were initially identified. These 133 studies represented a mixture of narrative case studies, theoretical articles, literature reviews, and empirical studies. The authors reviewed the abstracts of all 133 studies to determine eligibility for the current study.

Out of the 133 studies, 41 examined the effectiveness of FAP for therapy clients. Of these, 14 contained data that could be coded for an effect size (either self-report measures or graphical data). The authors also used the invisible college approach and placed requests on several FAP list-services and social media pages for articles relevant to this meta analysis. Three additional studies were collected using this strategy. The authors also used the ancestry approach and examined citations from the abovementioned studies. Additionally, the descendency approach was used to identify any additional articles that referenced the original FAP book by Tsai et al, 1991. No additional articles were located with the ancestry or descendency approaches. Figure 4 provides a description of the article selection process. In sum, 14 studies published between 1994 and 2015 and 3 unpublished studies were located and coded. These studies are briefly described in Table 1.

Methodological Characteristics of Studies

Participant Characteristics. Participants included 16 males and 9 females (the gender of 3 participants was unknown). Participants varied in age from 7 to 72 (M = 29.39, SD = 13.45) and the age of three participants was unknown. Information regarding ethnicity was not provided for 19 participants. For the nine participants whose ethnicity was reported, six were Caucasian, two were African American, and one was Latin.
Diagnoses were provided for 13 of the 28 participants. The most common diagnoses were: mood disorders \( (n = 4) \), personality disorders \( (n = 3) \), generalized anxiety disorder \( (n = 1) \), schizophrenia \( (n = 1) \), co-morbid mood and personality disorders \( (n = 2) \), co-morbid mood, personality and substance disorders \( (n = 1) \), and co-morbid mood, personality and posttraumatic stress disorder \( (n = 1) \).

**Targets of Treatment.** A variety of CRB1s and CRB2s were targeted for treatment (see Table 2). CRB1s and CRB2s were coded using the subscales of CRBs identified from the Functional Ideographic Assessment Template-Questionnaire (FIAT-Q; Callaghan, 2006) including assertiveness, bidirectional communication, emotional expression, and disclosure. As detailed in Table 2, the most common CRB1s were: problematic disclosure, problematic emotional expression, and conflict. The most common CBR2s were: Effective disclosure, adaptive emotional expression, and bidirectional communication.

**Intervention Characteristics and Study Design.** The included studies implemented FAP alone \( (n = 20) \), FAP-enhanced Acceptance Commitment Therapy \( (n = 1) \), FAP-Enhanced Cognitive-Behavioral Therapy \( (n = 1) \), FAP-Enhanced Behavioral Activation \( (n = 3) \), FAP Enhanced Cognitive-Therapy \( (n = 1) \), and FAP-Enhanced Child Behavior Analytic Therapy \( (n = 2) \). Fourteen studies used an A/B design, two used multiple-baseline design, and one used reversal design.

**Analysis of Effect Sizes**

The overall mean PND for all CRB1s was 57.76% \( (SD = 41.01) \) and CRB2s was 81.06% \( (SD = 33.37) \). The overall mean SMTE for CRB1s was 71.57% \( (SD = 33.89) \) and CRB2s was 80.68% \( (SD = 32.94) \). Given that there was variation in the PND and SMTE across studies,
analyses were conducted to determine the extent to which outcomes differed as a function of demographic characteristics, treatment targets, or treatment characteristics.

RCI scores were divided into symptom-based RCI scores and quality of life-based RCI scores. The overall means were 4.03 (SD = 3.57) and 2.39 (SD = 2.41), respectively. Similar to PND and SMTE, there was variation in RCI scores across studies, so separate analyses were conducted to determine the extent to which outcomes differed as a function of demographic characteristics, treatment targets, or treatment characteristics as well.

**Participant Characteristics and Outcomes**

To assess outcome variation as a function of participant characteristics, the PND for CRB1s and CRB2s were correlated with participant age. Results indicated that age was not significantly corrected with the PNDs for CRB1s ($r (12) = 0.32, p = 0.29$) or CRB2s ($r (12) = 0.24, p = 0.44$). Next, independent-samples t-tests were conducted to evaluate possible differences in PND between males and females. Results indicated the difference between males ($M = 43.69, SD = 38.89$) and females ($M = 55.83, SD = 45.87$) for PND of CRB1s was not significant; $t (11) = -0.51, p = 0.62$. An independent samples t-test for PND of CRB2s for males and females could not be conducted due small sample size. Because so few studies reported ethnicity and diagnoses, it was not possible to statistically compare outcomes as a function of either one of these characteristics for PND, SMTE, or RCI.

A similar set of analyses was conducted using SMTE as the outcome metric. The results of these analyses indicated that there were no significant relationships between age and SMTE of CRB1s ($r (12) = 0.06, p = 0.86$) or CRB2s ($r (12) = -0.19, p = 0.55$). Also, an independent-samples t-tests was conducted using males and females as groups for SMTE for CRB1s. Results indicated that the difference between males ($M = 62.50, SD = 33.94$) and females ($M = 84.63$,
$SD=19.88$) for SMTE of CRB1s was not significant; $t (11) = -1.45, p = 0.18$. An independent-samples t-test for SMTE of CRB2s could not be conducted due to small sample size.

RCI scores were also correlated with participant age. Results indicated that the relationship between age and symptom-based RCI scores was not significant ($r (7) = 0.57, p = 0.14$). Similarly, the relationship between age and quality of life-based RCI scores was not significant ($r (7) = -0.23, p = 0.58$). Independent-samples t-tests could not be conducted for overall RCI score, symptom-based RCI score, or quality of life-based RCI score of males and females due to small sample size.

**Treatment Targets and Outcomes**

To assess outcome variation as a function of treatment targets, the PND for CRB1s and CRB2s were compared. A paired-samples t-test was conducted for the subset of participants who had measures of both CRB1s and CRB2s. Results indicated that the average PND for CRB1s ($M= 70.23, SD= 38.54$) and CRB2s ($M=72.45, SD=37.54$) were not significantly different ($t (10) = -0.15, p = 0.88$). A similar strategy was used to evaluate differences using SMTE as the dependent variable. Results indicated that the average SMTE for CRB1s ($M = 74.19, SD = 36.93$) and CRB2s ($M = 71.89, SD = 36.83$) were not significantly different ($t (10) = 0.19, p = 0.85$). Paired-samples t-test for RCI scores could not be conducted due to small sample size.

**Intervention Characteristics and Outcomes**

In order to assess outcome variation as a function of intervention characteristics, correlations were conducted between number of sessions and PND, SMTE, and RCI. Results indicated that there were no significant relationships between number of sessions and PND for CRB1s ($r (11) = -0.36, p = 0.24$) and CRB2s ($r (12) = -0.12, p = 0.70$). Similarly, there were no significant relationships between number of sessions and SMTE for CRB1s ($r (11) = -0.03, p =
0.92) and CRB2s ($r (12) = 0.17, p = 0.59$). Finally, the relationship between number of sessions and RCI ($r (7) = 0.42, p = 0.18$) was non-significant. Independent-samples t-tests between FAP only interventions and FAP enhanced interventions could not be conducted due to limited sample size.
CHAPTER IV. DISCUSSION

FAP is a contextual behavioral therapy that uses basic behavioral principles in which the therapist works to shape client behavior in session. All of the published outcome studies examining the efficacy of FAP use single-case methodology (there is currently a randomized control trial in press authored by Maitland and Gaynor). Additionally, all of the published reviews of FAP efficacy have used a qualitative approach. There is thus a need to better understand the effectiveness of this therapy using a quantitative approach that can synthesize single subject data.

The current study assessed the methodology of the FAP outcome studies and also calculated effect sizes using PND, SMTE, and RCI scores. In order to better understand the effects of FAP, overall effect sizes were calculated. Additionally, variation in effect sizes evaluated in relation to participant demographics, treatment length, or type of FAP delivered.

Regarding methodology of previous FAP studies, the current review located 14 published FAP studies with empirical outcome data and three unpublished studies with empirical outcome data. A majority of the studies used an A/B design, followed by multiple baseline design, and finally a reversal design. Participants varied in age, ranging from childhood to late adulthood. A majority of participants were male. Little detail was provided regarding ethnicity, but the majority that were reported were Caucasian. Additionally, few participants received a DSM diagnosis. Generally, participants were treated for specific CRBs. The authors of the studies often identified which CRBs would be assessed in the article. The treatment provided in most studies was stand alone FAP.

Given these findings, there are a limited number of empirical investigations of FAP. Out of the 133 studies initially found when assessing functional analytic psychotherapy, only 14
(10%) evaluated outcomes using empirical data. A majority of the studies published in the FAP literature are either theoretical, reviews of literature, or narrative case studies. However, there is a history of more theoretical articles than empirical articles in the study of most contextual behavioral therapies including Acceptance and Commitment Therapy and dialectical behavior therapy (e.g. Öst, 2014; Panos, Jackson, Hasan, & Panos, 2014). For example, there are over 1,300 conceptual articles related to Acceptance and Commitment Therapy and 102 (7%) published randomized control trials at this time (“State of the ACT Evidence,” 2015). Thus, the percentage of treatment outcome evaluations are similar. However, the quality of outcome data is substantially different. Randomized control trials provide much stronger evidence for internal validity and external validity relative to A/B single-subject designs.

The American Psychological Association established criteria for evaluating empirical treatments. Chambless et al. (1998) suggested at least two appropriate between group design experiments or large series single-case designs with more than nine participants were needed demonstrate efficacy of a treatment. Chambless et al. (1998) also suggested that research should be done by independent researchers in different locations, who use treatment manuals, for a diversity of participants. At this time, FAP has a variety of different researchers and diversity of participants. However, FAP has not met the first criteria of strong experimental support.

Although randomized control trials are considered the “gold standard” in building treatment efficacy, it might be difficult to use this methodology for FAP. One reason for this is that FAP is idiographic. The FAP therapist initially conducts a functional analysis and then creates unique function-based treatment goals for each client. CRBs vary from client to client and must be assessed functionally, not topographically. This idiographic process does not lend itself well to a manualized protocol which is often needed for a randomized control trial.
Additionally, the Functional Analytic Psychotherapy Rating System (FAPRS; Callaghan & Follette, 2008) is currently the coding system that is used to assess if FAP was implemented correctly by the therapist and to assess changes in client behavior. The FAPRS is an intricate system that requires video recording and turn-by-turn coding of therapist-client interactions. The coding process is time consuming which may be another deterrent to conducting large scale randomized control trials. Finally, a majority of randomized control trials are conducted in group settings. Given the idiographic nature of FAP, this therapy would not be readily implemented in a group setting. In sum, there may be pragmatic reasons for why there is a paucity of FAP randomized control trials.

Given the difficulty of conducting randomized control trials using FAP, researchers could conduct more sophisticated single-subject design studies. A majority of the studies in the current FAP literature used an A/B design. The use of multiple baseline designs, A/B/C designs, or reversal designs could more fully assess the causal effects of FAP.

**Review of Meta-Analytic Results**

Despite the limited amount of empirical data, there are some strengths in current FAP studies. First, there is a fair amount of variation in targets of treatment. Second, there is good variation in age, gender, and ethnicity. Finally, articles came from a diversity of researchers from several different countries including the United States, Canada, Italy, and Brazil. The overall effect sizes for this meta-analysis fell in the “moderately effective” to “fairly effective” range for PND. Using SMTE, the overall outcomes can be classified as “significant” and using RCI scores, the overall outcomes can be classified as “clinically significant.” It is likely that the overall SMTE effect size was stronger than PND results because PND is a much more conservative method of calculating effect size. In sum, FAP is associated with significant
changes in a variety of CRB1s, CRB2s, symptom-based self-report inventories, and quality of life inventories.

Regarding client demographics, there were no significant relationships between age or gender and PND, SMTE, or RCI. There was also no significant difference in PNDs or SMTEs for CRB1s and CRB2s. Regarding treatment characteristics, there was no significant relationship between PND, SMTE, or RCI and length of treatment. Means for PND, SMTE, and RCI for FAP treatment compared to FAP-enhanced treatment could not be assessed due to the limited sample-size.

Limitations

A significant limitation of the present meta-analytic review is the difficulty in addressing the file drawer effect. Specifically, it is not possible to estimate how many non-significant case studies are needed to reduce the conclusions of overall effectiveness to ineffectiveness. Additionally, it is not possible to assess publication bias when examining single subject designs.

Overall Summary and Conclusion

The current study is a comprehensive analysis of the existing FAP treatment outcome literature. It provides an estimate of the efficacy of FAP based on single subject studies. Overall results indicate that there are promising effects for the various outcome measures used in the published studies. However, there is a clear need for more systematic and methodologically sound research in the FAP outcome literature. For a greater understanding of FAP efficacy, we recommend researchers conduct more randomized control trials or more sophisticated single-subject design studies. In addition to stronger methodology, the researchers suggest a greater emphasis on collecting and reporting participant demographics and targets of treatment. Overall,
there is evidence suggesting that FAP can be effective, but more research is needed to generate stronger conclusions about causality and magnitude of effect.
REFERENCES


depression: A successful and unsuccessful case using functional analytic psychotherapy.


New York: Oxford University Press, Inc.


Apuntes de Psicologia, 20(3), 347-368.

Maitland, D. W. M. (2015). *Functional analytic psychotherapy compared to watchful waiting for enhancing social connectedness: A randomized clinical trial with a diagnosed sample*


APPENDIX A. META-ANALYSIS CODING FORM

Study # _____

Coder: _____________________________________________________

Authors: _____________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________

Title: _____________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________

Journal: _____________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________

Comments: _____________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________
___________________________________________________
Participant(s) Characteristics

Subjects:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Recruitment Notes:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Therapist level of training:
______________________________________________________________________________

Total Number (n):
______________________________________________________________________________

Study Design (AB, ABAB):
______________________________________________________________________________

Baseline Sessions:
______________________________________________________________________________

Treatment sessions:
______________________________________________________________________________

Intervention utilized (FAP, FAP+DBT):
______________________________________________________________________________

Self-Report Measures:
______________________________________________________________________________

Reliability of Measures (Validation study):
______________________________________________________________________________

Mean score of measures (Validation study):
______________________________________________________________________________
Participant 1

Ethnicity: ____________________________________________________________

Gender: ______________________________________________________________

Age: _________________________________________________________________

Presenting Problems:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Number of treatment sessions: ________________________________
Baseline: ________________________________
Treatment: ________________________________

Length of treatment (in weeks):
____________________________________________________________________

CRB1s:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

CRB2s:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Pre-Assessment Scores:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
Post-Assessment Scores:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Graphical Analysis:

Floor/Ceiling Datum Point: _______________________________________________________
Number of Treatment Points Above/Below Floor/Ceiling Point_____________________

PND: _______________________________________________________________________

Add any comments about the unique features of this participant (not adequately coded by this form)
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Describe how compliance was assessed
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Describe any therapy process measures that were used
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Describe how treatment credibility was evaluated
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Describe any other treatment provided (information/education, weekly visits with physician, etc.)
Participant X

Ethnicity:
______________________________________________________________________________

Gender:
______________________________________________________________________________

Age:
______________________________________________________________________________

Presenting Problems:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Number of treatment sessions: _____________________________________________________
   Baseline: ________________________________________________________________
   Treatment: ______________________________________________________________

Length of treatment (in weeks):
______________________________________________________________________________

CRB1s:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

CRB2s:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Pre-Assessment Scores:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
Post-Assessment Scores:
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Graphical Analysis:

Floor/Ceiling Datum Point: _______________________________________________________
Number of Treatment Points Above/Below Floor/Ceiling Point_____________________

PND: _______________________________________________________________________

Add any comments about the unique features of this participant (not adequately coded by this form)
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Describe how compliance was assessed
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Describe any therapy process measures that were used
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________

Describe how treatment credibility was evaluated
______________________________________________________________________________
______________________________________________________________________________
Describe any other treatment provided (information/education, weekly visits with physician, etc.)

______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
______________________________________________________________________________
<table>
<thead>
<tr>
<th>Author</th>
<th>Participant Description</th>
<th>Study Design</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baruch, Kanter, Busch, &amp; Juskiewicz (2009)</td>
<td>1 Male (21)</td>
<td>Case Study</td>
<td>FAP-Enhanced ACT</td>
</tr>
<tr>
<td>Callaghan, Summers, &amp; Weidman (2003)</td>
<td>1 Male (30)</td>
<td>A/B Design</td>
<td>FAP</td>
</tr>
<tr>
<td>Cattivelli (Unpublished)</td>
<td>1 Gender/Age Unknown</td>
<td>Multiple</td>
<td>FAP</td>
</tr>
<tr>
<td></td>
<td>2 Gender/Age Unknown</td>
<td>Baseline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Gender/Age Unknown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cattivelli, Tirelli, Berardo, &amp; Perini (2012)</td>
<td>1 Male (12)</td>
<td>Multiple</td>
<td>FAP</td>
</tr>
<tr>
<td></td>
<td>2 Male (11)</td>
<td>Baseline</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Male (12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 Male (13)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Male (15)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ferro-Garcia, Lopez-Bermudez, &amp; Valero-Aguayo (2012)</td>
<td>1 Female (24)</td>
<td>Case Study</td>
<td>FAP</td>
</tr>
<tr>
<td></td>
<td>2 Male (42)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kohlenberg, &amp; Tsai (1994)</td>
<td>1 Male (35)</td>
<td>A/B Design</td>
<td>FAP-Enhanced CT</td>
</tr>
<tr>
<td>Lopez (2002)</td>
<td>1 Male (31)</td>
<td>A/B Design</td>
<td>FAP</td>
</tr>
<tr>
<td>Manduchi, &amp; Schoendorff (2012)</td>
<td>1 Female (36)</td>
<td>Case Study</td>
<td>FAP</td>
</tr>
<tr>
<td>Manos, Kanter, Rusch, Turner, Roberts, &amp; Busch (2009)</td>
<td>1 Female (22)</td>
<td>Case Study</td>
<td>FAP-Enhanced BA</td>
</tr>
<tr>
<td>McClafferty (2012)</td>
<td>1 Male (35)</td>
<td>Case Study</td>
<td>FAP-Enhanced BA</td>
</tr>
<tr>
<td>McCluskey (Unpublished)</td>
<td>1 Male (25)</td>
<td>A/B Design</td>
<td>FAP-Enhanced BA</td>
</tr>
<tr>
<td>Oshiro, Kanter, &amp; Meyer (2012)</td>
<td>1 Female (46)</td>
<td>Reversal</td>
<td>FAP</td>
</tr>
<tr>
<td></td>
<td>2 Male (18)</td>
<td>Design</td>
<td></td>
</tr>
<tr>
<td>Pedersen, Callaghan, Prins, Nguyen, &amp; Tsai (2012)</td>
<td>1 Female (41)</td>
<td>Case Study</td>
<td>FAP</td>
</tr>
<tr>
<td>Study</td>
<td>Sample Size</td>
<td>Design</td>
<td>Intervention</td>
</tr>
<tr>
<td>-----------------------------------------</td>
<td>-----------------</td>
<td>-----------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Singh &amp; O'Brien (Unpublished)</td>
<td>1 Male (72)</td>
<td>A/B Design</td>
<td>FAP</td>
</tr>
<tr>
<td></td>
<td>2 Male (52)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Female (31)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xavier, Kanter, &amp; Meyer, (2012)</td>
<td>1 Female (10)</td>
<td>Case Study</td>
<td>FAP-Enhanced Child Therapy</td>
</tr>
<tr>
<td></td>
<td>1 Male (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Participant</td>
<td>CBR1 Dimension</td>
<td>CRB2 Dimension</td>
</tr>
<tr>
<td>--------------------------------------------------</td>
<td>-------------</td>
<td>----------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emotional Expression</td>
<td>Emotional Expression</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Emotional Expression</td>
</tr>
<tr>
<td>Callaghan, G. M., Summers, C. J., &amp; Weidman, M.</td>
<td>1</td>
<td>Assertiveness</td>
<td>Assertiveness</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Bidirectional Communication</td>
<td>Bidirectional Communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disclosure</td>
<td>Disclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emotional Expression</td>
<td>Emotional Expression</td>
</tr>
<tr>
<td>Cattivelli, R., Tirelli, V., Berardo, F., &amp; Perini, S.</td>
<td>1</td>
<td>No Identified CRBs</td>
<td></td>
</tr>
<tr>
<td>Ferro-Garcia, R., Lopez-Bermudez, M. A., &amp; Valero-Aguayo, L.</td>
<td>1</td>
<td>Disclosure</td>
<td>Disclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Emotional Expression</td>
</tr>
<tr>
<td>Kanter, J., Landes, S., Busch, A., Rusch, L., Brown, K., Baruch, D., &amp; Holman, G.</td>
<td>1</td>
<td>Conflict Disclosure</td>
<td>Disclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Bidirectional Communication</td>
<td>Bidirectional Communication</td>
</tr>
<tr>
<td>Kohlenberg, R., &amp; Tsai, M.</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lopez, F. J. C.</td>
<td>1</td>
<td>Bidirectional Communication</td>
<td>Disclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conflict</td>
<td></td>
</tr>
<tr>
<td>Manduchi, K., &amp; Schoendorff, B.</td>
<td>1</td>
<td>Bidirectional Communication</td>
<td>Disclosure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disclosure</td>
<td>Emotional Expression</td>
</tr>
<tr>
<td>Authors</td>
<td>CRBs</td>
<td>Conflict Disclosure Emotional Expression</td>
<td>Disclosure Emotional Expression</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------</td>
<td>------------------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td>McClafferty, C.</td>
<td>2</td>
<td>Disclosure Emotional Expression</td>
<td>Disclosure Emotional Expression</td>
</tr>
<tr>
<td>Oshiro, C. K. B., Kanter, J., &amp; Meyer, S. B.</td>
<td>1</td>
<td>No Identified CRBs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Disclosure</td>
<td>Disclosure</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Emotional Expression</td>
<td>Emotional Expression</td>
</tr>
<tr>
<td>Xavier, R. N., Kanter, J. W., &amp; Meyer, S. B.</td>
<td>1</td>
<td>No Identified CRBs</td>
<td></td>
</tr>
<tr>
<td>Cattivelli, Robert</td>
<td>1</td>
<td>No Identified CRBs</td>
<td></td>
</tr>
<tr>
<td>McCluskey, Lee</td>
<td>1</td>
<td>No Identified CRBs</td>
<td></td>
</tr>
</tbody>
</table>
Figure 1. Example of PND for Participant X

Note. After calculating PND for X’s data after baseline and treatment, the data indicated the change in CRB1s were 25% (Ineffective) and 100% (Highly effective) for CRB2s.
Figure 2. Example of PND for Participant Y

Note. PND was calculated for Y and the change in CRB1s was 100% (Highly effective) and 100% (Highly effective) for CRB2s.
Figure 3. Example of SMTE for Participant X

Note. SMTE was calculated for X and the change in CRB2s was 57.14% with 4 points out of 7 above the celeration line.
133 Functional Analytic Psychotherapy Publications

41 publications intervention studies

14 publications with data

17 studies for meta-analysis

3 Unpublished studies

Figure 4. Review of the Literature