

# Transitional Probability Analysis of Two Child Behavior Analytic Therapy Cases

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## Abstract

This paper aimed to highlight the process of therapist direct contingent responding to shape client behavior in two Child Behavior Analytic Therapy (CBAT) cases using transitional probabilities. The Functional Analytic Psychotherapy Rating Scale (FAPRS) was used to code client behaviors and the Multidimensional System for Coding Behaviors in Therapist-Client Interaction (SiMCCIT) was used to code therapist behavior. Measures of behavior duration and transitional probability were taken from nine sample sessions for Client 1 and 10 sample sessions for Client 2. The first treatment was successful and lasted 18 sessions, while the second treatment was unsuccessful. In the first case, coding results showed that problem behaviors (CRB1) decreased, and improvement behaviors (CRB2) increased. In the second case, CRB1 predominated through seven sessions, and CRB2 did not show stability. Transitional probabilities indicated regularities in therapist responding to the client's clinically relevant behaviors, especially with approval after CRB2. It is concluded that contingent responding with approval functioned to shape client improvements in the first case, but not in the second case.

## Keywords

Behavior analysis, psychotherapy, childhood, transitional probability; mechanism of change

Clinical behavior analysis (Dougher, 1993; Kanter & Woods, 2009) assumes behavior analysis as the fundamental science and Skinner's Radical Behaviorism as the philosophical foundation for clinical psychology. In Brazil, clinical behavior analytic ideas have produced Behavior Analytic Therapy (BAT; Meyer et al., 2010), and more recently, Child Behavior Analytic Therapy (CBAT; Del Prette, 2011). From these theoretical and clinical standpoints, a fundamental issue in therapy is that therapy may produce rule-governed or contingency-shaped changes in client behavior (Skinner, 1974). While much of talk therapy may be seen as the therapist providing rules for clients to follow to change their behavior, regarding contingency-shaped behavior when the client behavior to be targeted for change occurs in session the therapist can provide consequences, thus shaping it as already suggested by Krasner (1962) in "The therapist as a social reinforcing machine".

This shaping process is specified in more detail in Functional Analytical Psychotherapy, or FAP (Kohlenberg & Tsai, 1991; Tsai, Kohlenberg, Kanter, Kohlenberg, Follette, & Callaghan, 2009). FAP's basic tenet is that the client's problem behaviors that appear in their daily relationships will also appear in therapy where the therapist can shape behavior through differential and contingent responding. The authors state that generalization occurs due to similarities between the therapy setting and the client's other environments, which implies that improvements achieved in session will generalize to the relationships that take place out-of-session. Therapist contingent responding is key to FAP and may start with general contingent reinforcement of broad classes of behavior relevant to simply to coming to therapy, and then reinforcement is funneled to focus more directly on clinically

relevant behaviors relevant to the goals of treatment identified by the client and therapist (Follette, Naugle, & Callaghan, 1996).

Recently, researchers have called for the identification of empirically supported principles of change (Rosen & Davison, 2003) and the development and use of novel methodologies in psychotherapy research, such as the direct observation of the therapeutic process instead of the use of randomized controlled trials or other group designs, to identify these change principles. Because contingent responding by definition is a change process that occurs in the turn-by-turn client-therapist interaction in session, it is a mechanism that is well suited to exploration by direct observation of the therapeutic process.

It is important to note that contingent responding is a mechanism that is not specific to FAP but is fundamental to BAT and CBAT, broadly defined, and may be seen by behaviorists as occurring in, and potentially important to, all forms of therapy. For example, an early classic process study by Truax (1966) used direct observation of the therapeutic process to explore the use of contingent responding in sessions conducted by Carl Rogers, a therapist well known for espousing the belief that the therapist's behavior should be unconditional as per his humanistic theory (Rogers, 1957) rather than contingent on client behavior as per behavioral theory. Truax, using independent coders blind to the study hypothesis, found that Rogers in fact contingently responded to specific client behaviors with empathy and positive regard, and that these responses functioned as reinforcement as indicated by the fact that the client behaviors responded to in this fashion increased in frequency over the course of therapy.

More recently, Busch, Kanter, Callaghan, Baruch and Weeks (2009) employed a similar micro-process analysis to explore the

hypothesized change mechanism of FAP. They used the FAP Rating Scale (FAPRS; Callaghan & Follette, 2008) to code client clinically relevant behavior and therapist effective responding to in-session client behavior on a turn-by-turn basis over the course of therapy for a depressed adult client who received three phases of therapy: Assessment, Cognitive Behavior Therapy (CBT), and FAP. FAPRS coding revealed that client in-session behavior improved only in the FAP phase, and it was also demonstrated that 51% of instances of client problematic behavior and 46% of instances of client improvement behavior were followed by therapist appropriate contingent shaping responses during the FAP phase. Additional data on this client further suggested that out-of-session behavior only improved during FAP (Kanter et al., 2006). Thus, findings were supportive of the hypothesis that the therapist contingently responded with reinforcement to specific targeted client behaviors during FAP—suggesting that FAP's mechanism occurred—and these behaviors increased in frequency in-session and out-of-session, suggesting that generalization occurred.

A limitation of Busch et al. (2009) is that the coding protocol involved two raters coding as a team in order to produce adequate inter-rater reliability, thus the reliability of the FAPRS with single coders is unknown. Furthermore, the procedure for coding therapist behavior as appropriate contingent responding or not required the observers to code the therapist's behavior as either reinforcing or not, based on how the behavior appeared in the moment. However, reinforcement technically can only be determined by observing changes in the frequency of the behavior upon which it is contingent, not by guessing at the function in the moment. In other words, micro-process coding research may identify which therapist behaviors are reinforcing not by having coders guess at the function but by identifying different types of therapist responses and then determining which responses functioned as reinforcement by observing changes in the frequency of client behavior over time in relation to different contingent therapist responses.

Such a micro-process coding approach has been used in Brazilian studies of the client-therapist interaction in BAT (Oshiro, 2011; Meyer, 2009; Rocha, 2008; Donadone, 2009; Silveira, 2009; Del Prette, 2006; Del Prette, Xavier, Oyama & Meyer, 2008). For example, Del Prette et al. (2008) explored hypotheses about contingent responding using the *Multidimensional System for Coding Behaviors in Therapist-Client Interaction* (SiMCCIT; Zamignani, 2007), an in-session verbal behavior coding system created from a systematic review of the literature to identify various categories of therapist verbal responding in session. In Del Prette et al. (2008), the third and the estimated sixtieth session (which occurred two years after the beginning of therapy) of CBAT treatment with a ten-year-old boy who displayed oppositional defiant behavior were coded using the SiMCCIT. Client behaviors were coded as *problem behavior* characterized by avoidance of the therapist's requests, *improvement behavior* characterized by following the therapist's requests, or *other behavior*. Data suggested an inversion of problem and improvement behavior over time in that problem behavior was more frequent than improvement behavior in the third session and improvement behavior exceeded problem behavior in the sixtieth session. In addition, transitional probability analyses found

that, in the third session, 63% of the client's problem behavior was followed by therapist disapproval and 56.3% of the client's improvement behavior was followed by therapist approval. In the sixtieth session the few client problem behaviors that occurred were followed by different therapist behaviors or directly by another client behavior, and 37.2% of the client's improvement behavior was followed by therapist approval, indicating that while responding to problems with disapproval had successfully eliminated most client problem behavior, responding to improvements was still prevalent but more intermittent. A major limitation of this study, however, was that the coding occurred without an evaluation of inter-rater reliability among observers.

The current study involving two cases of CBAT sought to explore contingent responding as a mechanism of change in CBAT by replicating and extending the previous studies in several ways. The first aim was to establish satisfactory indexes of inter-observer agreement with both the FAPRS and the SiMCCIT with single observers rating independently. The second aim was to describe the course of therapy using FAPRS codes to identify the frequency of occurrence of client problem behaviors and improvement behaviors across sessions. The third aim was to categorize therapist verbal behavior in session using SiMCCIT codes, and then to use transitional probability analysis to identify which therapist behaviors functioned as punishment and reinforcement of client problem and improvement behaviors, respectively.

## ■ METHOD

### PARTICIPANTS

Therapists were two Psychology major undergraduate<sup>1</sup> students in a São Paulo University, conducting their clinical practicum under the supervision of a behavior analytic therapist. The clients were a 10-year old girl and a seven-year-old boy, both enrolled in primary school with complaints of school difficulties. Therapists signed informed consent to participate in the research, and the clients' guardians signed an authorization for videotaping.

### CASE DESCRIPTIONS

The first client presented with lack of interest in academic issues and learning deficits. She was at risk of repeating the fourth grade. Therapy lasted 18 sessions. After an initial assessment, the therapist's interventions consisted, besides guardian orientation, of evoking and responding to the problems of lack of interest and giving up during sessions. To evoke the problem behavior, the therapist provided difficult activities such as reading, anagram games, and 100-piece puzzles.

The second client presented with learning deficits and oppositional defiant behavior. This client avoided interpersonal interactions, including those with therapist, presented childish talk, refused to engage in activities proposed by adults, produced stereotyped cartoonish talk and song lyrics, and stated that he wanted to remain little and never grow up. His parents demand-

<sup>1</sup> In Brazil, Psychologist training can be accomplished during undergraduate studies in Psychology, with BA and BSc degrees. Clinical practicum is conducted under supervision.

ed an autism diagnosis to the therapist and to other professionals. An important change in his treatment occurred. Because the client did not respond to the therapist's attempts to shape his behavior through interpersonal strategies (such as approving or disapproving behaviors), the therapist included more directive strategies (as tokens and gifts) in the final sessions.

## INSTRUMENTS

*Functional Analytic Psychotherapy Rating Scale (FAPRS, Callaghan & Follette, 2008).* The clients' behaviors were coded with FAPRS, a turn-by-turn coding system designed to capture key client and therapist behaviors in FAP. For the current study, five key client behavior codes were used, including codes for clinically relevant behavior (CRB), specifically CRB1 (client problem behavior occurring in session), CRB2 (improvements in client problem behavior occurring in session), and CRB3 (client descriptions of variables controlling his/her CRB), and codes for reports on out-of-session behavior, including O1 (outside problem behavior consistent with CRB1), and O2 (outside improvements consistent with CRB2). In addition, an Outside Other Behavior (OB) category was created. In other studies using the FAPRS (e.g. Busch et al., 2010), each turn of speech received a code, but in the current study a turn could receive multiple codes attributed to two or more distinct actions within a turn.

To be categorized as CRB1, the behavior should occur in session and be an instance of a problem. The first client's CRB1s included giving up, cheating, and requesting to give up. The second client's CRB1s including failing tasks, opposition, defying, ignoring the therapist, reproductions of cartoon talk and song lyrics, and stating "I want to be little" or the equivalent.

CRB2 were instances of improvements related to CRB1 that also occurred in session. For the first client, CRB2s included collaboration, engagement, requesting help, taking initiative and following rules. For the second client, CRB2s included performing well in tasks, assertiveness, returning to interactions with the therapist, accepting interventions, and stating willingness to grow up. Some CRB1 or CRB2 could be nonverbal motor behavior.

CRB3 were clients' descriptions of variables controlling his/her clinically relevant behaviors - even if brief. Reports of behaviors occurring outside sessions were coded as O1 when they referred to problems and as O2 when they referred to improvements. All other verbalizations were categorized as Other Behavior (OB), including talk about daily routines, establishment of game rules, and answers to therapist questions. Nonverbal behavior was never coded as CRB3, O1, O2 or OB.

*Multidimensional System for Coding Behaviors in Therapist-Client Interaction (SiMCCIT; Zamignani, 2007).* Therapists' behaviors were coded according to the Axis I of SiMCCIT, and each distinct verbalization or communicative gesture could receive one or more codes. Fifteen categories were used: Report request (RRE), Facilitation (FAC), Empathy (EMP), Information (INF), Reflection Request (RRQ), Interpretation (INT), Approval (APR), Disapproval (DIS), Other Verbalizations (TOU), Agreement Gesture (AGT), Disagreement Gesture (DGT), Command Gesture (GMT), and Other Gesture (GOT).

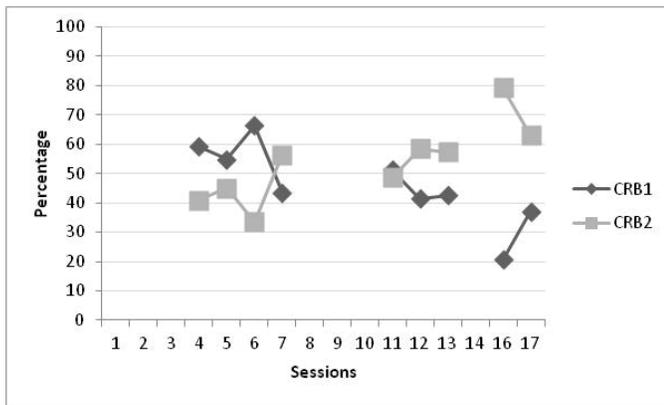
RREs are therapist verbalizations in which the client is asked to describe actions, events, feelings or thoughts. An example

is "how was the test last week?" FAC is characterized by short verbalizations which indicate attention to the client's report and suggest its continuity, such as "uhum" or "I know". EMPs are therapist's actions and verbalizations which suggest welcoming, acceptance, such as "yes, this book really has difficult words to read". INFs are verbalizations in which the therapist describes events or informs the client about events, such as "it is your turn to play". RRQs are verbalizations in which the therapist asks the client about qualifications, explanations, interpretations, analysis or predictions about any kind of event, as in "why do you think that you improved at school?". REC are verbalizations in which the therapist suggests alternatives of action to the client or requests his engagement in actions and tasks, as in "use letter 'a'" (settle a word in the anagram). INT are verbalizations in which the therapist describes or infers causal and/or explanatory relations, as in "you were able to finish because you worked fast; when one tries, one can do it". APRs are verbalizations that suggest favorable assessment or judgment on actions, thoughts, characteristics or client's assessments, as in "Well done! That was clever!" DISs are verbalizations that suggest unfavorable assessment or judgment about actions, thoughts, characteristics or client's assessments, as in "you did it wrong, this word doesn't exist". Other verbalizations were categorized as TOU for not being classifiable in the previous categories. AGT are approval or confirmation gestures, such as nodding. DGT are disagreement or denial gestures, such as shaking her head as if to say no. GMT are command gestures, such as pointing at a game as if asking the client to pick it up. Other communication gestures were categorized as GOT, such as making a peace sign in a competitive game.

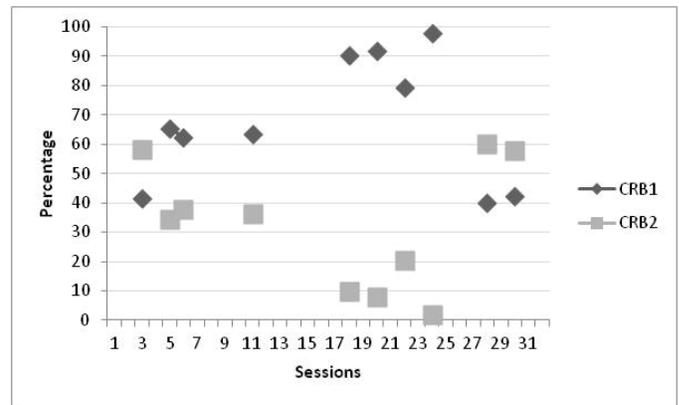
## OBSERVERS AND CATEGORIZATION

The observers were a Master's degree student in clinical psychology and a BA in Psychology. They had experience in Behavior Analytic Therapy, were familiar with FAP concepts and underwent the standardized training in SiMCCIT (Zamignani, 2007). The first observer, first author of this work, coded a sample of 10 of the 18 sessions from the first case and 10 of 32 sessions from the second case. 18<sup>th</sup> session data from the first case were not considered because the final therapy session was not representative of the case. Other sessions were not analyzed, including atypical first sessions from both cases, caregiver orientations, and technical problems with videotaping. The second observer independently categorized a random session of each case for inter-rater agreement tests. For training, 60 minutes of categorization were conducted together by the observers, and an independent observer had access to another 60 minutes of categorizations performed by the first observer in sessions of the first case.

The categorizations were done using *The Observer Pro* software, which is an interface which enables the recording of events in a spreadsheet while the video sessions are shown in a computer display window. For each session, the program produced a list of all client FAPRS and therapist SiMCCIT codes given during that session, in ordinal sequence, with the start and end times of each code registered to the second.



**Figure 1.** Percentage of the time in which CRB1 and CRB2 occurred of the total session time of clinically relevant behaviors in 9 sample sessions for Client 1. CRB1: problem behavior; CRB2: improvement behavior.



**Figure 2.** Percentage of the time in which CRB1 and CRB2 occurred of the total session time of clinically relevant behaviors in 10 sample sessions for Client 2. CRB1: problem behavior; CRB2: improvement behavior.

**TRANSITIONAL PROBABILITY**

Transitional probabilities indicate which therapist responses occurred after client behaviors. The transitional probability of Y given X is the likelihood that the Y event occurs given that the X event occurred at some previous moment. When sequences of events are analyzed, the event that follows X immediately is called Lag 1. The transitional probability in Lag 1 answers the question “as X occurred, what is the percentage of times in which Y will be the next event?” The lag of a transitional probability can be extended, as in Lag 2, which investigates which event occurred two steps forward in the sequence. Transitional probabilities were used to identify the therapist’s immediate reactions to the client’s behavior at Lag 1. More complex sequential analysis methods, such as Lag Sequential Analysis, Markov models, and Information Theory (Lichtenberg & Heck, 1986) were not used, since the objective of this study was to analyze temporally close sequences.

**RESULTS**

**INTER-OBSERVER AGREEMENT**

Agreement was calculated for 10% of the categorized sessions, i.e., one session from each case. The Kappa index was calculated separately for client FAPRS codes and therapist SiMCCIT codes for each client. For Client 1, agreement for the client’s behaviors was  $k = .81$  (93.25% agreement) and agreement for the therapist’s behaviors was  $k = .91$  (92.81% agreement). For Client 2, client agreement was  $k = .75$  (83.76% agreement) and therapist agreement was  $k = .72$  (79.41% agreement).

**CLIENT BEHAVIOR OVER THE COURSE OF THERAPY**

The average duration of client codes was calculated. OB occurred more often for both clients, occurring 77% of the time for Client 1 and 57% for Client 2. CRBs (including CRB1, CRB2 and CRB3) occurred 21% of the time for Client 1 and 42% of the time for Client 2. Os (O1 and O2) occurred 2% and 1%, respectively, for Client 1 and 2. There were fewer occurrences of CRBs and Os than OBs in both cases, and more CRBs occurred in the second case.

Figures 1 and 2 show the duration of clients’ CRB1s and CRB2s of the total duration of clinically relevant behaviors, in 9 sample sessions for Client 1 and 10 sample sessions for Client 2. In the first case, CRB1 decreased and CRB2 increased from Session 4 to Session 17. The gradual decrease of CRB1 and increase in CRB2 was not observed in the second case. Instead, CRB1 predominated over seven sessions, and CRB2 did not show stability. CRB2 occurred more than CRB1 in only sessions 3, 28 and 30. CRB3 data are not displayed, but for Client 1 there was a gradual increase in CRB3 from Session 6 to Session 17, and for Client 2, CRB3 did not show any stability.

**THERAPIST BEHAVIOR AND TRANSITIONAL PROBABILITIES**

Several within-session temporal sequences were observed, including behavioral sequences from the same participant (e.g., client CRB1 followed by client CRB2), sequences started by the therapist and sequences in which specific therapist codes never occurred with probability higher than 0.05, independent of the client’s code that preceded it. Because the objective of the current analysis was to examine the differential contingent responding of the therapist to the client’s CRB1 and CRB2, for the current analysis only sequences started by the client’s CRB1 or

**Table 1.** Transitional probabilities of therapist responding to Client 1’s CRB1s and CRB2s at Lag 1.

|                 | RRE  |    | FAC  |   | EMP  |    | INF  |    | RRQ  |    | REC  |    | INT  |   | APR  |     | DIS  |    |
|-----------------|------|----|------|---|------|----|------|----|------|----|------|----|------|---|------|-----|------|----|
|                 | TP   | n  | TP   | n | TP   | n  | TP   | n  | TP   | n  | TP   | n  | TP   | n | TP   | n   | TP   | n  |
| CRB1<br>N = 295 | 0.1  | 29 | 0.01 | 2 | 0.07 | 20 | 0.09 | 26 | 0.08 | 25 | 0.09 | 28 | 0.01 | 2 | 0.01 | 3   | 0.24 | 71 |
| CRB2<br>N = 368 | 0.07 | 27 | 0.02 | 6 | 0.02 | 7  | 0.15 | 56 | 0.01 | 3  | 0.05 | 17 | 0.01 | 3 | 0.38 | 139 | 0.01 | 4  |

**Legend.** CRB1: Problem behavior; CRB2: Improvement behavior; RRE: Report Request; FAC: Facilitation; EMP: Empathy; INF: Information; RRQ: Reflection Request; REC: Recommendation; INT: Interpretation; APR: Approval; DIS: Disapproval; TP: Transition Probability.

CRB2 and followed by the therapist's behavior with significant occurrence are presented. The results can be observed in the Table 1 for Client 1 and Table 2 for Client 2, below.

The bolded relations in Table 1 indicate that therapist contingent responding with relatively high frequency for Client 1 took the form of Disapproving responses after CRB1 (TP = 0.24) and Approving responses after CRB2 (TP = 0.38). Other high frequency contingent responses were Requesting Reflections after CRB3 (TP = 0.21), Report Requests after O1 (TP = 0.43) and O2 (TP = 0.29), and Information after OB (TP = 0.28).

The bolded relations in Table 2 indicate a different pattern. For Client 2, CRB1 was contingently responded to more often by Information (TP = 0.26) and CRB2 was followed by Approval (TP = 0.48). In this case, only CRB1 and CRB2 were discriminative for the therapist's responding, because all other client's codes were predominately followed by RRE.

## ■ DISCUSSION

The objective of this work was to code turns of speech and some specific nonverbal behavior in sessions of two Child Behavior Analytic Therapy cases. The first aim was to establish inter-observer agreement using the FAPRS and the SiMCCIT with single observers rating independently. The second aim was to describe the course of therapy for the two cases in terms of patterns of in-session CRB1s and CRB2s over time. The third, and primary, aim was to verify using transitional probability analysis whether the shaping process of therapist contingent responding to CRBs could be observed by a change in the client's behavioral pattern related to the therapist's differential contingent responding.

Agreement tests revealed that both systems were adequate to carry out this investigation with single raters. CRBs were identified in CBAT sessions by an investigator who was not the therapist, which can be considered an important methodological possibility for investigating the process of therapy using these systems. Detailed training in the accurate observation of CRBs, previous experience with behavior analysis and the primary FAP concepts, and the nature of the client's complaints likely contributed to the good agreement indexes produced in this work, higher than those found in literature (Busch et al., 2010; Zamignani, 2007). Further investigations can explore whether clinical cases characterized by the occurrence of more subtle CRBs, such as manipulating or telling lies, can produce similar levels of agreement.

Results indicate that CRBs were not the only focus of these CBAT sessions. CRBs, despite being important to the shaping of improved client repertoires, are not the only target of an

intervention. Other processes, including data collection and maintenance of the therapeutic relationship, are relevant. The small proportion of CRBs encountered with Client 1, however, also may be explained by the nature of the presenting problem, which concerned school difficulties, and resulting CRBs. In Client 2, the presenting concerns were intimately related to interpersonal relationships and thus CRBs were observed more frequently in the client-therapist interaction. CRBs may become even more frequent when complaints involve, for example, clients who are too talkative, sometimes speaking without relation to what was said by the interlocutor, and each verbalization may be coded as a CRB1 or a CRB2. In the current study, for Client 1 CRBs only occurred in specific situations in which the therapist prepared academic activities to evoke relevant behaviors, and for Client 2 they occurred more frequently in interpersonal interactions with the therapist that were aversive to the client.

For Client 1, the pattern of CRBs over time indicates a clear decreasing trend of CRB1s and an increasing trend of CRB2s, as in Busch et al. (2009) and Del Prette et al. (2008), suggesting a successful outcome (at least in terms of in-session behavior) for this client. In other words, from a sample of 9 of 18 CBAT sessions for Client 1 a gradual changing of the client's response pattern can be observed with the relative rates of CRB1s and CRB2s inverting in the positive direction over the course of therapy. It is noted, however, that in general CBAT treatments are longer than 18 sessions, and it is not possible to predict if this gradual change in the client's behavior could be observed from the analysis of ten sessions of a therapy with the duration, for example, of one year.

A different pattern is observed for Client 2, in that no clear decreasing or increasing trends can be found in the client's codes. CRB1 predominated over seven sessions, and CRB2 did not show any stability over time. Simply put, these data indicate that this CBAT therapy was not successful at increasing the frequency of targeted CRB2s over time, or at decreasing CRB1s. The difficulty may be related to the case conceptualization, that is, because of the pattern of client avoidance of interpersonal interactions, consequences provided by therapist may not have had the intended effects on client behavior, and no consistent change was observed in these sample sessions. This issue will be discussed again below.

The transitional probabilities for Client 1 indicate that CRB1s were followed predominantly by therapist disapproval and CRB2s by therapist approval. Combined with the observed changes in the rates of CRB1s and CRB2s over time, this suggests that therapist approval and disapproval may have had re-

**Table 2.** Transitional probabilities of therapist responding to the Client 2's CRB1s and CRB2s at Lag 1.

|                 | RRE  |          | FAC  |          | EMP  |          | INF  |          | RRQ  |          | REC  |          | INT |          | APR  |          | DIS  |          |
|-----------------|------|----------|------|----------|------|----------|------|----------|------|----------|------|----------|-----|----------|------|----------|------|----------|
|                 | TP   | <i>n</i> | TP  | <i>n</i> | TP   | <i>n</i> | TP   | <i>n</i> |
| CRB1<br>N = 389 | 0.22 | 84       | 0.01 | 5        | 0.05 | 21       | 0.26 | 101      | 0.02 | 9        | 0.19 | 72       | 0   | 1        | 0.01 | 3        | 0.07 | 29       |
| CRB2<br>N = 402 | 0.15 | 60       | 0    | 2        | 0.02 | 8        | 0.14 | 56       | 0.01 | 5        | 0.10 | 40       | 0   | 0        | 0.48 | 193      | 0    | 0        |

**Legend.** CRB1: Problem behavior; CRB2: Improvement behavior; RRE: Report Request; FAC: Facilitation; EMP: Empathy; INF: Information; RRQ: Reflection Request; REC: Recommendation; INT: Interpretation; APR: Approval; DIS: Disapproval; TP: Transition Probability.

inforcing and punishing functions on CRB2s and CRB1s, respectively. These data agree with FAP's theory that highlights the importance of contingent responding as a mechanism of change; specifically therapist responses that function to punish/extinguish problem behaviors and to strengthen improvement behaviors as they occur in session. Other mechanisms, however, also could be responsible for the changes. It was observed, for example, that the therapist planned specific activities related to client's complaints, such as educational games and challenging activities. These tasks could themselves provide aversive or reinforcing stimuli that could shape client's behavior. The client's behavior also could have come under the control of rules created from interpretations and recommendations provided by the therapist.

In Client 2, data suggest that therapist did not offer disapproval in response to the client's problems, because disapproval demonstrated a low frequency of occurrence after CRB1s. The therapist may have been under the control of the case conceptualization and avoided punishing the client's behavior, since interpersonal interactions appeared to be aversive to the client and the therapist may have tried to create a non-punitive environment within the therapy. Thus, therapist did not disapprove of the client's CRB1s. Instead, the therapist frequently provided information in response to CRB1s, which could be seen as a subtle way to provide punishment, but it did not appear to function as such in this case as it was not effective at decreasing problem behavior.

Despite of high frequency of occurrence of therapist approval after CRB2, CRB2s did not increase through treatment for Client 2. These data suggest that approval did not function as reinforcement of CRB2 for this client. This suggestion is consistent with the case conceptualization, because the client's avoidance of interactions may imply that the therapist attempts to praise or approve may also have had aversive functions or simply did not have any effect. This analysis is consistent with the increased frequency of CRB2 relative to CRB1 in the third, 28<sup>th</sup> and 30<sup>th</sup> sessions, when it was observed that the therapist prepared specific school tasks, like reading or writing. In addition, in the final sessions, the therapist used tokens and gifts as rewards to the client's good performance on tasks. Possibly the natural reinforcement of doing well on tasks, or the arbitrary reinforcement from rewards, and not the therapist's verbal approval, were the effective consequences that improved client's CRB2 in these sessions. Overall, the data from Client 2 suggests that the therapist avoided disapproval in response to CRB1s and provided approval in response to CRB2s but it was not effective. This speaks to the need in CBAT for both the therapist to observe the effects of his or her behavior on the client over time and a dynamic case conceptualization that can change in response to observed effects, to better identify effective punishing and reinforcing responses in difficult clients such as Client 2.

## ■ CONCLUSION AND FUTURE DIRECTIONS

The current study produced positive results in two case studies, consistent with Kazdin (1982) suggestion that studies should be replicated to increase internal validity. Both cases presented acceptable agreement on observer ratings and data indicated that

there was differential and contingent responding of therapists to the clients' CRBs and other codes. Overall, this study provides important confirmation that reinforcement in FAP and in related therapies such as BAT and CBAT must be measured by change in client behavior over time and cannot be assumed to occur based on the form of the therapist's behavior. Specifically, therapist approval, a common therapist response that many therapists may assume is reinforcing, appears to only have functioned as reinforcement for one case while it had no effect on the second case. The methodological decision in the current study to measure client CRBs with the FAPRS but to measure therapist responses with a topographical system, the SiMCCIT, allowed the reinforcing effects of therapist responses to be appropriately determined by examining the change in client CRBs over time and the transitional probabilities analysis to indicate which therapist responses may have been responsible for the change. Future experimental research on the effects of therapist verbal behavior in therapy is desirable, to explore both the role of shaping—how responses function as reinforcement—and to test the influence of other processes involved in therapy, such as the presentation of rules and rule governance.

## ■ REFERENCES

- Baruch, D. E., Kanter, J. W., Busch, A. M., Plummer, M. D., Tsai, M., Rusch, L. C., Landes, S. J. & Holman, G. I. (2009). Lines of Evidence in Support of FAP. In Tsai, M., Kohlenberg, R. J., Kanter, J. W., Kohlenberg, B., Follette, W. C. & Callaghan, G. M. *A guide to Functional Analytic Psychotherapy: awareness, courage, love and behaviorism*. Washington: Springer.
- Busch, A. M., Callaghan, G. M., Kanter, J. W., Baruch, D. E. & Weeks, C. (2010). The functional Analytic Psychotherapy: a replication and extension. *Journal of Contemporary Psychotherapy*, v. 40, (1), 11-19.
- Busch, A. M., Kanter, J. W., Callaghan, G. M., Baruch, D. E., Weeks, C. E. & Berlin, K. S. (2009). A micro-process analysis of Functional Analytic Psychotherapy's mechanism of change. *Behavior Therapy*, v. 40, (3), 280-290.
- Callaghan, G. M. & Follette, W. C. (2008). FAPRS Manual: Manual for the Functional Analytic Psychotherapy Rating Scale. *The behavior analyst today*, v. 9, (1), 62-97.
- Del Prette, G., Xavier, R. N., Oyama, S. & Meyer, S. B. (2008). *Análise de contingências e categorização de sessão: um estudo de caso* [Analysis of contingencies and coding sessions: a case study]. Presented work. Institute of Psychology, University of São Paulo, Brazil. Aks for a copy with the first author in [mxavier@usp.br](mailto:mxavier@usp.br).
- Donadone, J.C. (2009). *Contingency Analysis of Orientation and Self-orientation in Behavioral Clinical Interventions*. Doctoral Dissertation. Institute of Psychology, University of São Paulo, Brazil.
- Follette, W. C., Naugle, A. E., & Callaghan, G. M. (1996). A radical behavioral understanding of the therapeutic relationship in effecting change. *Behavior Therapy*, 27, 623-641.
- Kanter, J. W. & Woods, D. W. (2009). Introduction. *The Behavior Analyst*, 32, 1 – 5.
- Kazdin, A. E. (1982). *Single-case research designs: methods for clinical and applied settings*. New York: Oxford University Press.
- Krasner, L. (1962). The therapist as a social reinforcing machine. In H. H. Strupp & L. Luborsky (Eds.), *Research in Psychotherapy* (Vol. 2, pp. 61-94). Washington, DC: American Psychological Association.
- Meyer, S. B. (2009). Analysis of 'requesting information' and 'recommendation' based on data base of behavior therapy. Associate Professor Thesis. Institute of Psychology, University of São Paulo, Brazil.
- Meyer, S. B., Del Prette, G., Zamignani, D. R., Banaco, R. A., Neno, S., & Tourinho, E. Z. (2010). Análise do Comportamento e Terapia Analítico-Comportamental [Behavior Analysis and Behavior Analytic Therapy]. In Emmanuel Zagury Tourinho & Sergio

Vasconcelos de Luna. (Org.). *Análise do Comportamento. Investigações Históricas, Conceituais e Aplicadas*. São Paulo: Roca, pp. 153-174.

Oshiro, C. K. B. (2011). Single-case experimental design: Functional Analytic Psychotherapy with two difficult clients. Doctoral dissertation, Institute of Psychology, University of São Paulo, São Paulo, Brazil.

Rocha, G. V. M. (2008). *Behavior Analytic Psychotherapy with high-risk juvenile offenders: antisocial patterns modification and criminal recidivism decrease*. Doctoral Dissertation. Psychology Institute, University of São Paulo, Brazil.

Rosen, G. M., & Davison, G. C. (2003). Psychology should list empirically supported principles of change (ESPs) and not credential trademarked therapies or other treatment packages. *Behavior Modification*, 27, 300–312.

Silveira, F. F. (2009). The analysis of the therapeutic interaction in a group intervention with caretakers. Master Thesis. Faculdade de Ciências, Universidade Estadual Paulista "Julio de Mesquita Filho", Bauru, SP, Brazil.

Skinner, B. F. (1974). *About Behaviorism*. New York: Alfred A. Knopf, Inc.

Truax, C. B. (1966). Reinforcement and nonreinforcement in rogerian psychotherapy. *Journal of abnormal psychology*, Vol. 71, No. 1, 1-9.

Zamignani, D. R. (2007). Development of a multidimensional system for coding behaviors in therapist-client interaction. Doctoral Dissertation. Psychology Institute, University of São Paulo, Brazil.

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