Extended Behavior-Context Relations: a Molar View of Functional Analytic Psychotherapy

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Abstract This paper seeks to reinterpret current tenets of functional analytic psychotherapy (FAP) using some assumptions of molar behaviorism. In it, a conceptual alternative to the molecular approach is proposed to explain the mechanisms of change of FAP. To achieve this goal, the utility and limitations of using discrete responses and stimuli as units of analysis are discussed. As an alternative, this paper suggests, as proposed by molar behaviorism, using activities as the unit of analysis. The use of activities as the unit of analysis would allow analyses of clinical behavior as choices in different time scales and measurements of clinical behavior using time allocation. Using choice behavior to analyze data allows analyses of behavior in terms of its short-term and long-term value. It is argued that time allocation as a unit of measure is more appropriate than the rate of behavior because it allows the continuous measurement of behavior and comparisons of disparate behaviors as they occur during therapy sessions. Finally, a multi-scale analysis would allow the articulation of long-term and short-term contingencies that are related to therapy and behavioral change.

Keywords Molar behaviorism · Functional analytic psychotherapy · Time allocation · Multi-scale view

Functional analytic psychotherapy (FAP) is a behavioral approach that harnesses the therapeutic relationship to achieve behavioral changes in clinical outpatient settings (Tsai, Yard, & Kohlenberg, 2014). One of the core characteristics of FAP is the use of contiguous therapist responses to the clients' behavior to increase socially adjusted repertoires. This assumption is consistent with the molecular view of behavior (see Baum, 2002).

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Baum proposed that the molecular view of behavior assumes that contiguity between a response and its consequence is necessary to increase the strength of the response and thus its frequency. However, this assumption is associated with some difficulties, which will be addressed in the present paper. For example, the focus on moment-by-moment interactions makes it difficult to analyze interactions over a wider timeframe. An alternative paradigm, the molar view of behavior (MVB), may help explain behavior at different scales of time in a consistent way. The MVB is a paradigm that assumes that behavior is an aggregate of behavioral events that are extended over time as opposed to discrete responses (Baum, 2002).

Equally important for the discussion in this article is that the mechanisms of change of FAP are based on general behavioral principles. This characteristic presents an opportunity to test the generalizability of basic findings in applied settings. Conversely, the development of FAP technology may be aided by the use of basic research findings to improve current procedures (for a discussion of the relevance and development of basic and applied research interactions, see Lit & Mace, 2015; Mace & Critchfield, 2010; Virues-Ortega, Hurtado-Parrado, Cox, & Pear, 2014). This interaction between applied FAP findings and basic research findings may be expanded by analyzing therapy interactions at different scales of time.

The present article aims to interpret current tenets of FAP using some of the assumptions of the MVB. This interpretation allows us to propose an alternative analytical unit to explain the mechanisms of change of FAP, which in turn will help achieve two additional goals: (a) to discuss potential research directions to elucidate the variables that influence behavioral change at different time scales and (b) to present research directions to facilitate interactions between clinical research and basic research findings.

This paper first presents the core features of FAP. Next, some characteristics of molar behaviorism are presented. An example of the way in which this concept may build on the current conceptual development of FAP then follows. Finally, the importance of considering local and molar contingencies and their applications to an explanation of behavior in the FAP model will be discussed. Potential research directions are presented in the last two sections of the paper.

Foundations of Functional Analytic Psychotherapy

Tsai, Kohlenberg, Kanter, Hollman, and Loudon (2012) proposed that to explain why a behavior occurs, it is necessary to identify the context that evokes it and its consequences. Therefore, an explanation of behavior uses relationships between a behavior, an antecedent stimulus, and its consequence. The relationship between these three elements has traditionally been called three-term contingency.

The main characteristics of FAP are based on the three-term contingency. First, one assumption in the relationship between client and therapist is that behaviors that are functionally similar to those outside the therapy setting will occur. Some of these behaviors will be relevant to the problems that the client aims to solve in therapy. These behaviors are called clinically relevant behaviors (CRBs), of which there are three kinds. CRB1s are in-session behaviors that are functionally similar to the client's behavioral problems. CRB2s are in-session behaviors that

correspond to improvements in these problems. CRB3s are clients' functional interpretations of their own behavior. Second, FAP techniques involve five rules: (1) be aware of CRB, (2) evoke CRB, (3) respond therapeutically to CRB, (4) watch for the effect of the therapist's responses on client's behaviors, and (5) offer tools for behavior generalization (Tsai et al., 2012; Tsai, Kohlenberg, Kanter, & Waltz, 2009).

These characteristics are closely related to the three-term contingency. Accordingly, rules 1 and 2 assume that the therapist's behavior and some characteristics of the clinical setting are antecedents for the occurrence of CRBs. Rules 3 and 4 assume that the contingent therapist's responses to CRBs will increase or decrease their occurrence. When a therapist applies rules 2 and 3, the resulting procedure is very similar to the differential reinforcement of alternative behavior schedule. Thus, CRB1s are placed on an extinction schedule, whereas CRB2s are shaped until a socially desirable topography is achieved. Rule 5 derives from the need to generalize the stimulus control of behavior, so the therapist is not the only antecedent for behavioral improvements (for an operational explanation and application of the five rules of FAP, see Weeks, Kanter, Bonow, Landes, & Busch, 2012).

When FAP is used, client behaviors are conceptualized as responses. This means that behaviors are assumed to be specific behavioral instances with a beginning and a temporally close end. Furthermore, it assumes that behaviors can be counted and that therapeutic improvement consists of a decrease in the number of times they occur (Kohlenberg, Tsai, & Kanter, 2009). Nevertheless, when behavior is measured this way, it is assumed to be an instantaneous event because its duration is ignored (Baum, 2002). Similarly, the context is conceptualized as a series of instantaneous environmental events that are related to behavior.

Another characteristic of FAP is that it assumes that the effect of therapy on the client's behavioral changes is attributable to the contiguity of the therapist's responses to the client's behaviors. This is precisely why clients' behaviors are evoked within the therapy setting (Baruch et al., 2009). Baruch et al. argued that the acquisition of a response is better when feedback is immediate than when it is delayed based on the basic literature available that points out this relation.

The concept of response class is also important for understanding FAP because it helps to explain why problems in daily life and their improvements occur in the therapy setting (Kohlenberg, Tsai & Kanter, 2009). Response classes are sets of instances of behavior that share a specific relationship with the environment (Skinner, 1935). Therefore, responses that are part of a class co-vary with a stimulus class in the environment. For a response to be part of a class, it is required to have characteristics that are common to all response instances and systematically co-vary with antecedent or consequential environmental events (Skinner, 1963).

Functional analytic psychotherapy has potential because it applies to outpatient settings a way of understanding behavior that has been shown to be very effective at developing technologies to modify behavior in other settings. Additionally, it has received increasing attention and has received empirical support in recent years (for review, see Mangabeira, Kanter, & Del Prette, 2012). Next, I discuss ways in which to use the MVB to interpret the principles of behavioral change mentioned above.

Some Characteristics of Molar Behaviorism

The characteristics of FAP that are discussed in this paper are part of what Baum (2002) called the molecular view of behavior. The MVB differs with the traditional paradigm with regard to many assumptions and its unit of analysis. Instead of using discrete responses, the MVB uses a unit of analysis that is consistent with the assumption that the relationship between contextual events and behavior is continuous and extended in time. Another characteristic of the MVB is that it is not based on temporal contiguity between stimuli and responses but rather on the correlation between them (Baum, 2013). This alternative to the molecular explanation seeks to explain human behavior in a consistent way and offers some advantages over molecular analysis.

Some Difficulties with the Conceptualization of Behavior as Discrete Events

The following anecdote will be useful for illustrating the difference between the molecular and molar views of behavior. Kohlenberg and Tsai (2007) described an interaction between Mavis Tsai and her client, Christina. In that interaction, Christina said something that led Mavis to think that her explanation of her depression was that she could not count on anyone. Mavis told Christina that she was not alone because Christina had her, but Christina felt misunderstood. It seemed that Christina's interpretation was that Mavis was demanding her to stop feeling bad and disregarding her feelings. Because of this response, after the session, Mavis wrote a poem and sent it to Christina by email, hoping to express the way she saw Christina's life. Christina replied to the email, telling Mavis that the poem was one of the nicest things anyone had ever done for her. According to Kohlenberg and Tsai (2007), the poem was part of a pattern of interaction between Mavis and Christina during the therapy sessions that taught Christina that she deserved attention and her feelings were valid by taking seriously her thoughts and emotions.

This anecdote shows levels of interaction at different scales of time that are typical of psychotherapy. In the first level, Mavis told Christina that she was not alone immediately after Christina told her about her interpretation of her depression. This kind of interaction occurs during therapy sessions and implies contiguity between the client's and therapist's responses. At a broader level, there was the period of time between sessions when Mavis sent the poem. Finally, an even wider time scope was mentioned by Kohlenberg and Tsai that accounted for the entire therapeutic process.

In the anecdote, Mavis wrote and sent the poem to Christina many hours after the therapy session had ended. She probably did other things before sending it (e.g., she may have thought about how to change the case conceptualization and different ways to reach Christina), and she needed time to write the poem. From the perspective of the molecular analysis of behavior, these behaviors would be disarticulated for explanatory reasons (for one common explanatory strategy, see Palmer, 2003). However, this set of behaviors shares a common antecedent (i.e., the events of the last therapy interaction) and a common consequence (i.e., the modification of Christina's behavior). This is an example of how the molecular paradigm to explain behavior does not fit the continuous nature of behavior.

The molecular view of behavior carries some methodological disadvantages for clinical settings and can misrepresent the nature of the behavior. The molecular view

sees behaviors as discrete events and uses frequency to measure them (Baum, 2002; Timberlake, 1995). However, in-session events are continuous and extended, which makes a discrete analysis difficult. For example, an emotionally intimate interaction consists of other actions. To perform a molecular analysis of such a situation, one must divide the interaction into parts. For example, it is possible to divide a conversation into turns of speech and count them (e.g., Callaghan, Summers, & Weidman, 2003). However, if only the number of times a behavior occurs is taken into account, then the duration is lost in the analysis. A greater number of CRB1s than CRB2s might occur, but CRB2s may last longer. This implies that the client could be performing more CRB2s than CRB1s, but an analysis based on frequency may not reflect this fact.

Although the use of discrete responses is very useful, it is important to keep in mind that divisions of behavior are an imposition of the observer. The occurrence of a response as a discrete unit can only be inferred once the observer has been watching the behavior for enough time. Therefore, if the behavior is observed for a short period of time, then it is not possible to identify or characterize it properly (Baum, 2002). For example, it is possible to identify CRBs as such only when the client's behavior and its consequences have been observed over an extended period of time. This means that only by knowing the pattern of behavior is it possible to identify an instance of behavior as a relevant behavior (Baum, 2013).

Activity: an Alternative Unit of Analysis

Baum (2002, 2004, 2013) proposed the concept of *activity* as an alternative to discrete responses as unit of analysis that have many characteristics. The first assumption is that behavior is continuous and extended in time. Accordingly, behavior is measured using time allocation instead of frequency (Baum, 2013). A second assumption of using activity as a unit of analysis is that behavior is grouped by consequences. Therefore, two very different behaviors might be part of the same activity if they have the same set of consequences and antecedents. A third assumption of activity as a unit of analysis is that behavior is considered a choice because time is limited, and people must choose to which behavior they will allocate time (Baum, 2013). Finally, an activity may be understood as a whole that is divisible into other activities that occur within a shorter period of time. The shorter activities are related by their effects on the context (Baum, 2013). Clearly, the concept of activity preserves many similarities with the concept of response class, but the main difference between these concepts is the possibility of doing a multi-scale analysis (Baum, 2002).

Time Allocation as a Measure of Behavior Rachlin (1989) argued that measures of time allocation present many advantages over measures of response rate. Measures of time allocation allow measurement of behavior when this division by discrete responses is artificial or difficult to accomplish. It also allows comparison of behaviors with different topographies, or are asymmetrical (e.g., when the person chooses whether to perform a behavior or not). This may occur within a session when a client chooses between talking about emotions that are involved in the therapeutic relationship and talking about anything else.

The basic research literature provides some examples of using time allocation (e.g., Pear, 1985; Buckner, Green, & Myerson, 1993; Ribes-Iñesta & Torres, 2000; Ribes-

Iñesta, Torres, Correa, & Montes, 2006), but the applied literature has only a few such examples. These papers exemplify the utility of time allocation as a measurement strategy. For example, Neef et al. (2005) performed an experiment to assess impulsivity across three groups of children: (a) typically developing children, (b) children with a diagnosis of attention-deficit/hyperactivity disorder (ADHD) who were taking medication, and (c) children with an ADHD diagnosis who were not taking medication. The authors used time and response allocation to measure choice under concurrent schedules. The options were two different sets of math problems, and the reinforcers were access to activities or tangibles. At baseline, each option differed in one of the four dimensions (i.e., response effort, immediacy of access to the reinforcer, rate of reinforcement, and quality of reinforcement) to identify whether the children would differentially respond to different values of each dimension. In the assessment phase, the authors assessed which dimensions were the first, second, and least influential. Therefore, one dimension was placed in competition with another. For example, when effort and immediacy were placed in competition, option 1 had a high-effort response with immediate access to reinforcement, and option 2 had a low-effort response with delayed access to reinforcement.

The results showed that when choice was measured by time allocation, the most influential dimension for children with ADHD (with and without medication) was immediacy, whereas quality was the most influential for typically developing children. However, the most influential dimension for children with ADHD who were not taking medication was quality when measured by response allocation, unlike the time allocation measure. Neef et al. (2005) used time and response allocation to ensure an appropriate measurement of one of the dimensions (effort) because time allocation could bias the results. Nevertheless, the data did not show that such bias occurred (for other examples of applied studies using time allocation, see Gardner, Wacker, & Boelter, 2009; Neef, Bicard, & Endo, 2001; Rapp, Vollmer, St. Peter, Dozier, & Cotnoir, 2004). These results suggest the importance of using both kinds of measures in studies that involve the FAP mechanism of change, which will be argued later in this paper.

Choice Between Activities Behavior takes time, and time is limited. Almost no behavior can be performed at the same time as another; therefore, behavior is a choice. Every activity competes with other activities to occupy a portion of time (Baum, 2005). In the studies cited above, the experimental arrangements measured more than one behavior, and three of the studies used concurrent schedules. The use of more than one behavior and the possibility of choosing between behaviors is a characteristic that these experiments share with therapy sessions. During therapy sessions, the clients choose to perform different behaviors. For example, Kanter et al. (2006) compared a successful case and an unsuccessful case that were treated with FAP. According to these authors, the client in the unsuccessful case possibly found that the parallels between the therapeutic relationship and his daily life were aversive. In this case, using strategies to measure choice between discussing CRBs and other in-session events and discussing only daily life behaviors might be useful. Therefore, if the concept of activity is used as a unit of analysis, then it is possible to study behavior in terms of time that is allocated to CRB1s, CRB2s, or any other behavior.

Behavioral Nesting Activities are made up of other activities with a shorter duration. Therefore, local activities are part of molar activities, and they are related by their shared consequences. For some people, working consists of going to the office, interacting with other people, receiving information, and modifying information. Each of these activities is part of an overall activity that includes them (e.g., working) because as a whole they share the same consequence, which is earning money. Additionally, earning money is part of the activity of feeding (see Fig. 1). In this way, a molar activity, like feeding, is made up of more local activities, such as working, buying groceries, and cooking. To find molar activities, it is necessary to observe behavior for a sufficient amount of time to identify which behaviors share the same consequences.

In the aforementioned anecdote, to know which molar activity was comprised by writing and sending the poem, one needs to know the molar consequence of this and other actions, which appears to have been to let Christina know that Mavis cared about her and to show Christina that her feelings made sense, given her experience. Therefore, the therapy interaction and the actions that were related to sending the poem shared the common consequence of helping Christina feel understood. Similarly, this activity was part of another activity (i.e., influencing Christina's behavior). This activity occurred for as long as the therapy lasted.

Molar and Local Contingencies The analysis of molar activities implies the observation of behavior and its relationship with its context over extended periods of time. Taking this extended relationship into account is necessary to understand behavior. Kohlenberg and Tsai (2007) mentioned that the poem in the anecdote above was important to Christina, but it was also one part of the overall therapeutic process, which consisted of different and extended interactions between Mavis and Christina that taught Christina that she was worthy of consideration and care.

Similar to the anecdote, psychotherapy requires many sessions to achieve behavioral improvements. Thus, we can understand the therapeutic process as a molar activity. Understanding the therapeutic process as a molar activity allows us to distinguish between molar and molecular contingencies in therapy. A molar contingency is a relationship between aggregates of behavior and its long-term effects (Baum, 2005; Rachlin, 2004). In the anecdote, Mavis set contingencies at the local level to shape

Fig. 1 Activities may be divided into smaller activities in different scales

Christina's behavior, but these contingencies shared consequences with long-term social contingencies. That is, Mavis delivered short-term consequences for Christina's behavior while helping her achieve new long-term outcomes.

Sometimes the short-term value of behavior is similar to the long-term value of its aggregates (i.e., for a person who has received attention and care for expressing her emotions, this activity will have a high value in the short and long term). Conversely, the local value of an activity might be different from its value when the activity is performed in the long run (Rachlin, 2004). Imagine Juan, a person with intimacy issues who learns how to start a romantic relationship and finds it gratifying. Therefore, Juan begins to spend more time in this activity and eventually begins many relationships at the same time. Also imagine that he finds a long-term relationship valuable and more gratifying than a short-term one. Nevertheless, to achieve such a relationship, he is required to spend time in activities with a very low short-term or local value (i.e., expressing his emotions or letting his partner know his needs). In this case, there is a conflict between local and molar contingencies.

Conflict Between Local and Molar Contingencies Rachlin (2004) coined the term *complex ambivalence* to describe a conflict between the local and molar value of the same behavior. In Juan's case, spending 3 months engaged in one activity (i.e., getting involved in a short-term relationship) has greater value than spending the same amount of time in another activity (i.e., developing an emotionally intimate relationship). Nevertheless, if Juan spends years choosing to have short-term relationships, then he is losing the opportunity to develop an intimate, committed relationship, which is something he values more than a series of short-term relationships. Thus, Juan prefers short-term relationships in the current 3 months, and at the same time, he would prefer to spend the next 3 years building a meaningful relationship over spending that time in short-term relationships. Therefore, after years of short-term relationships, Juan probably would continue experiencing the low value that short-term relationships represent to him (relative to the higher value of long-term relationships), despite the time he has spent in romantic relationships. Moreover, Juan might experience some consequences that are related to the molar activity he has chosen. For example, he can experience a lower level of subjective well-being and a lesser extent of social support from his partner than if he would have chosen a steady relationship (e.g., Kamp Dusch & Amato, 2005).

On many occasions, patients attend therapy sessions because of conflicts between molar and local contingencies. The therapist's job in these cases is to increase time allocation to activities with a greater molar value (which usually corresponds to more socially adjusted behaviors than the client's current ones). A familiar example of complex ambivalence is a case that is related to patterns of avoidant behavior. For example, in cases of agoraphobia, a person constrains his access to morally valuable activities (e.g., having a regular job, familial interaction, recreation activities) because of his scarce time allocation to locally aversive activities that are part of those molar activities (e.g., being surrounded by a crowd, remaining in public spaces without company, going to places that are related to previous panic attacks).

This section discusses the conceptual advantages of using activities as unit of analysis. This conceptualization represents a set of alternative assumptions to the current foundations of FAP. Both alternatives can articulate the same phenomena

because they are different paradigms (Baum, 2002). Therefore, to make a better case for the MVB, I now present clinical applications based on the concepts explained in this section.

Clinical Implications of Using Activities as Unit of Analysis

Implications of Time Allocation

Some studies have analyzed the mechanisms of change of FAP. These studies were based on analyses of the occurrence of CRBs and contiguous responses of the therapist to them using the Functional Analytic Psychotherapy Rating Scale (FAPRS; Callaghan & Follette, 2008; Busch, Kanter, Callaghan, Baruch, Weeks, & Berlin, 2009; Busch, Callaghan, Kanter, Baruch, & Weeks, 2010; Callaghan et al., 2003; Lizarazo, Muñoz-Martínez, Santos, & Kanter, 2015). The FAPRS classification of clients' behaviors into CRB1s and CRB2s and therapists' responses into effective and ineffective. It also allows analyses of contiguity between therapists' responses and CRBs.

These studies provided evidence that contiguous responses of the therapist to CRBs are related to changes in the frequency of such behaviors in therapy sessions and daily life (i.e., Busch et al., 2009; Kanter et al., 2006; Landes, Kanter, Weeks, & Busch, 2013). They used response-counting (Fig. 2) and the analysis of contiguity between the therapist's and client's in-session responses. However, the use of time allocation allows comparisons of allocation to CRB1s and CRB2s during therapy. A change in time allocation to CRB1s and CRB2s will probably be reflected in a change in frequency, so there would not be any advantage of using time allocation. However, as mentioned previously, Neef et al. (2005) reported that measures of time or response allocation may have important influences on the results. Additionally, response duration is most likely different in every instance of behavior.

Generally, studies that have used the FAPRS reported an increase in CRB2s but not necessarily a decrease in CRB1s. The use of time allocation will probably reveal clearer differences between the beginning and end of therapy because, as mentioned above, it

Fig. 2 Percentage of CRB1 and CRB2 throughout the therapy process. Figure published in Busch et al. (2010)

allows a measure of activities with disparate topographies. Additionally, this unit may help elucidate changes in patterns of allocation to CRB1s and CRB2s during therapy.

Implications of Analyzing CRBs as Choice Behavior

It is possible to involve choice in the analysis of behavioral changes using the FAPRS. For example, Busch et al. (2010) classified CRBs into functional classes using the Functional Ideographic Assessment Template (Callaghan, 2006). They found that the assertion of needs was the only functional class with a sufficient number of responses to perform the data analysis. This type of classification allows us to measure CRB1s and CRB2s as two possible comparable choices.

To perform an analysis of choice based on the results of Busch et al. (2010), the response distribution between CRB1s and CRB2s can be used as a measure. According to Busch et al. (2010), their participant's CRB1s were attention-seeking and dramatic responding. Conversely, this client's CRB2s included identifying his needs from therapy and the therapist. Because this client was choosing between emitting CRB1s and CRB2s while he was interacting with the therapist, a strategy to compare choices between options is useful for measuring change throughout therapy. Equation 1 presents the behavior ratio (BR) as one way to present changes in choices between two options over time (Rachlin, 1989)¹:

$$BR = \frac{a}{a + b} \quad (1)$$

where a corresponds to the number of times one option is chosen, and b corresponds to the number of times the other option is chosen. For the present discussion, a refers to CRB1s and b refers to CRB2s. A decrease in the BR would mean that the client is changing his preference from allocating time to CRB1s to allocating his time to CRB2s.

Figure 3 depicts the BR of a , which were calculated using the percentages of CRB1s and CRB2s presented by Busch et al. (2010): 0—the client is choosing exclusively CRB2s and 1—all responses emitted by the client in that session are CRB1s. The first sessions showed the participant's clear preference for CRB1s, which occurred on nearly 75% of occasions, whereas CRB2s occurred on nearly 25% of occasions. A pronounced decrease in choices for CRB1s occurred, particularly between sessions 11 and 15. Nevertheless, the number of times that the participant chose b was smaller than the number of times he chose a . At the end of therapy, the BR of a approached the point of indifference, which would have occurred at 0.5.

This analysis allows us to see that the value of CRB1s decreases throughout therapy because the client chooses CRB1s a decreasing number of times as the sessions go on. Using the value of responses for analysis would likely help identify relevant variables for treatment. For example, if a therapist chooses CRB1s with a very high value for the clients, then they would choose the competing option (CRB2) at a very low rate, which would compromise the effectiveness of treatment (for another analysis of choice in

¹ Currently, a more usual way of measure choice is by using the general matching law equation (see Davison & Baum, 2000). However, because zero choices of one kind of CRB may be observed in some therapy sessions, using this strategy would be inconvenient.

Fig. 3 Behavior ratio of CRB1 throughout therapy

clinical settings, see Waltz & Follette, 2009). Finally, although Fig. 2 shows the effect of therapy on the client's behavior, the use of BR in Fig. 3 allows us to more clearly see the relationship between the two behaviors.

This may also allow us to study the generalizability of some basic research findings. For example, when FAP is applied, CRB1s are placed on an extinction schedule, and CRB2s are reinforced. Figure 3 shows the effect of an extinction schedule that was applied to CRB1s while another option with similar consequences was available. Baum (2012) argued that extinction is a case of shifting behavioral allocation that occurs when the organism discriminates that reinforcement is no longer available contingently to the behavior that is placed on extinction. Studies of the effects of FAP on the time allocation to CRBs may contribute to a better understanding of extinction and choice processes in human behavior.

Implications of Using Behavioral Nesting: Local and Molar Analysis of Behavior

The use of activities as unit of analysis allows local (i.e., moment-by-moment) and molar (i.e., aggregate) analysis of behavior. Baum (2010) presented a multi-level analysis of the dynamics of choice, which is the analysis of changes in behavioral allocation that are caused by alterations in the context. Based on this perspective, when a client attends therapy, he finds a set of artificial contingencies that are provided by the therapist that are rather unusual for his daily context. Therapy contingencies perturb the equilibrium between reinforcement and behavioral allocation that the client has probably achieved in his daily life. This kind of equilibrium has been described by the matching law, which has shown tremendous generalizability across species, contexts, and types of reinforcer (Mazur & Fantino, 2014). Because of the change in context, the client's behavioral allocation shifts according to the reinforcement that is available.

Research on the mechanisms of change of FAP has focused on showing behavioral change across sessions or comparing the beginning with end of therapy (e.g., Busch et al., 2010). However, Baum (2010) showed that analyzing shorter periods of time within sessions when changes in context have been introduced allows studies of the dynamics of choice. The analysis within each therapy session might contribute to understanding the variables that are involved in changes in the distribution of behavior. For example, a series of experiments by Baum and colleagues (see Baum, 2010) that used different time scales showed that pigeons and rats presented what they referred to as a *preference pulse*. A preference pulse is a momentary shift of choices toward the operandum that just delivered food in variable interval-variable interval (VI-VI)

concurrent schedules. This is similar to what has been observed in FAP therapy interactions, in which after a client engages in CRB2s and the subsequent therapist reinforcement, clients often engage again in CRB2s (for a detailed discussion, see Weeks et al., 2012). This may indicate that the preference pulse might occur across types of reinforcers and species. This possibility is worth exploring further and is of interest for basic research. With regard to FAP, analyses of smaller time scales while considering CRBs as choices may contribute to understanding the variables that are involved in unsuccessful and successful cases. For example, the absence of preference pulses may indicate that contingent responses of the therapist are not reinforcing the client's behavior and may predict therapy dropout.

Functional analytic psychotherapy may also benefit from widening the time scale of analysis. In the anecdote presented above, Mavis helped Christina get in touch with the outcome of a different molar contingency compared with before therapy through continuous exposure to short-term contingencies. The molar outcomes that Christina obtained after therapy were likely related to the ability to establish relationships in which she could feel valued. To access such consequences, Christina likely needed to allocate time to many local activities, such as asking for things she needed, asking for changes in behaviors of others, and other activities. These activities likely occurred very seldom previously and had very low value at the beginning of therapy, most likely because they were followed by negative consequences in Christina's previous context. The short-term contingencies that Christina encountered before therapy precluded her from accessing a valuable molar contingency because her behavior was under the control of short-term aversive consequences. Through the therapy process, Mavis shaped new local activities in Christina's repertoire and increased the local value of these activities. To increase the local value of activities, Mavis probably shaped more appropriate topographies that could increase the chances that the particular activity had positive consequences, which made it easier to perform these activities and decreased their cost per unit of time spent. Ultimately, the new set of activities allowed Christina to experience more valuable long-term consequences, such as maintaining rewarding social relationships.

Many strategies that are utilized by FAP allow an increase in time allocation to activities with low local value, such as establishing a safe environment to perform previously punished activities (Tsai, Kohlenberg, Kanter, & Waltz, 2009), linking low-value local activities with high-value molar activities (Tsai, Kohlenberg, Bolling, & Terry, 2009), and developing acceptance of aversive experiences (Kohlenberg, Tsai, Kanter, & Parker, 2009), among others.

Nevertheless, other strategies that have been developed in basic research on self-control allow us to link local contingencies with molar ones. For example, restructuring links a single choice with a complete series of choices of the same kind (Rachlin, 2004). For illustration, let us revisit Juan's case. If Juan is given the choice between 12 short relationships (option *A*) or one long relationship (option *B*) over a 1-year period of time (*T*), then he would likely find it easier to choose the long relationship. Conversely, if he must choose between both options every time, he would find it harder to choose the long relationship because he would be comparing a short period of time (*t*) of *A* (option *a*) with a short period of time of *B* (option *b*), and *b* would thus have greater local value. When the choices are grouped, the higher value of

the molar activity versus the local activity is clearer, which increases the probability that Juan will choose *A* (Fig. 4).

In therapy, to achieve restructuring, one possible strategy is using verbal behavior, which is the case in some basic research studies (Kudajie-Gyamfi & Rachlin, 1996). Acceptance and commitment therapy (ACT; Hayes, Strosahl, & Wilson, 2012) involves many strategies to weaken what is referred to as “the control agenda.” In these strategies, the long-term effects of avoidance behavior are underscored using language. This allows the client to identify the low value that his molar activity has, despite the greater value of the local activities (for an interpretation that is consistent with the ACT model of behavioral change, see Blackledge & Barnes-Holmes, 2009).

In this case, activities that are related to avoidance correspond to option *a* in Fig. 4 and activities that are related to the valuable molar activity correspond to option *b*. When a therapist asks her client what the long-term outcome is of choosing the current pattern of behavior the client has, the therapist is facilitating the clients’ discrimination of the client’s molar activity and related consequences (option *A*). It also allows the clients to discern that his current molar activity has less value than activity *B*, which would be consistent with the client’s goals. Although many advances have been made using these types of strategies, it is important to identify additional strategies that can facilitate clients’ restructuring of their choices. Achieving this would facilitate the maintenance of changes that are obtained during therapy once the therapy is over. It may also contribute to basic research on self-control.

Final Comments and Research Directions

The MVB can enrich the FAP analysis of clinical behavior by identifying meaningful behavior-context relations in different scales of time. Additionally, the MVB allows us to identify other strategies of data analysis and permits the articulation of principles of other subdisciplines, such as behavioral economics and choice research, with clinical explanations of change. The present paper discussed some implications of using the MVB to inform FAP and some possible directions to develop this therapy both empirically and conceptually. To achieve this, some general concepts of molar

Fig. 4 Value per amount of time allocated to each activity. If the person must choose between *a* and *b*, then *a* would have greater value. If the person must choose between *A* and *B*, then *B* would have greater value (based on Rachlin, 2004)

behaviorism were explained, and some differences with the molecular view of behavior were discussed. This paper was not exhaustive with regard to the implications of using a MVB to interpret the current conceptual model of FAP. Among the possible additional topics are the roles of private events and verbal behavior in explanations of clinical behavior and behavioral change.

Some possible research directions were mentioned in the previous sections (i.e., assess behavioral change using time allocation, using BR to measure choice, and exploring within-session changes in behavior). However, to conclude this paper, it is worth mentioning two additional research areas that are based on the present analysis: the analysis of molar activities in clinical behavior and some possibilities for translational research.

Research on Molar Activities in Clinical Behavior I discussed some possible long-term relations between activities and contingencies from a theoretical point of view. However, to achieve an empirically based molar analysis of clinical behavior, one possibility is to gather daily life data in the long-term. In the FAP literature, some studies measured the effects of therapy on clients' behaviors in daily life (e.g., Landes et al., 2013; Lizaraso et al., 2015). These analyses were centered on the frequency of behavior. However, one interesting line of investigation would be to determine the types of contingencies that are involved in maintaining CRBs, which would involve both the frequency of behavior and its consequences. Another possibility is to measure time allocation in daily life (e.g., daily or weekly). These measurement strategies have been applied to different kinds of variables (e.g., socialization, energy expenditure, and technological change, among others; see Johnson, 1990).

Using these strategies to measure activities in daily life can help draw parallels between in- and out-session time allocation to activities that are related to treatment. Additionally, it might be possible to identify important factors that are related to changes in and the maintenance of time allocation and context-behavior relations at different time scales. Finally, it might be possible to test the generalizability and clinical utility of molar functional relations, such as matching, complex ambivalence, discounting, and variability (for a wider description of these relations, see Waltz & Follete, 2009; Rachlin, 2004). This strategy might constitute a complementary approach for prospective and longitudinal studies to further our understanding of long-term behavioral relations, with the advantage that single-case research implies (e.g., Hurtado-Parrado & López-López, 2015).

Two possible pitfalls of this approach are that certain activities can be part of many molar activities at the same time, and daily life records are based on participants' verbal reports. Humans are generally not good at tracking causal relations of their behavior, especially in the long term (e.g., Rachlin, 2004), and data based solely on verbal reports may lack validity. Unfortunately, daily life measurements that are not based on verbal reports are oftentimes cost-prohibitive. A partial solution is to use smartphones to collect data in real time, which could increase their validity. Killingsworth and Gilbert (2010) collected data using an application that contacted participants through their smartphones at random moments during their waking hours; asked questions about activities, thoughts, and emotions; and recorded their answers in a database. This strategy of data collection can be used to determine the amount of time that participants spend in activities that are targeted in therapy and their consequences over extended

periods of time. Nonetheless, the use of smartphones for such data collection would not entirely obviate the issues related to measurements based on verbal reports.

Translational Research One possibility of increasing interactions between FAP and basic research is to perform laboratory-based studies of the mechanism of change in FAP that contribute to the application of basic research findings. An experiment with undergraduate students that was performed by Haworth, Kanter, Tsai, Kuczynski, Rae, and Kohlenberg (2015) showed that delivering reinforcement for disclosing personal information increased the depth of the disclosures during a 45-min one-on-one session of interaction between participants and research assistants. In this study, a discrete-trials procedure was used. However, it is worth exploring procedures that allow us to study concurrent and extinction schedules to analyze the dynamics of choice and changes in time allocation in continuous interactions.

Haworth et al. also analyzed the long-term effect of the experimental session. They measured participants' interpersonal closeness to the research assistants at three time points: (a) post-test, (b) 48 h after the experimental session, and (c) 2 weeks later. The results showed that scores of closeness were greater at the three time points in the group that received reinforcement than in the two control groups. Besides, even though scores of closeness lasted until the last time point, they were lower than at the first time point. Based on these data, it seems important to explore the lasting effects of reinforcement on CRB2s using different qualities of reinforcement and with longer histories of reinforcement to contribute to our understanding of distal behavior-context relations.

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Compliance with Ethical Standards

Conflict of Interest The author declares that he has no conflict of interest.

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