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A translational approach to the functional analysis of language in psychotherapy



Javier Virues-Ortega^{a,*}, María Xesús Froján-Parga^b

^a University of Auckland, School of Psychology, Auckland, New Zealand

^b Universidad Autónoma de Madrid, Psychology Department, Madrid, Spain

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Abstract The functional analysis of verbal behavior has been successful in establishing basic and advanced forms of language in individuals with developmental disabilities. The development of behavioral approaches to psychotherapy, such as the functional-analytic psychotherapy, have advanced the implementation of operant analyses of verbal behavior among typical adults. The field of behavior-analytic approaches to psychotherapy departs from the applied experimental research in behavior analysis in various ways: (a) minimal use of molecular analyses of behavioral processes using single-subject experimentation, (b) confined use of functional analysis and function-driven intervention, and (c) metaphoric use of mainstream behavioral concepts and methods. The breakthroughs brought about by behavioral approaches to psychotherapy may be supplemented by way of translating some of the findings of the applied experimental literature. The present analysis illustrates how behavioral processes demonstrated in the context of experimental research, often with individuals with developmental and intellectual disabilities, may be relevant to psychotherapy with typically-developed adults. This translational approach is discussed with reference to basic language processes: echoics, mands, tacts, and intraverbal dynamics. This approach could prompt programmatic translational research in the field of behavioral psychotherapies.

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PALABRAS CLAVE

Conducta verbal;
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Un enfoque traslacional aplicado al análisis funcional del lenguaje en psicoterapia

Resumen El análisis funcional de la conducta verbal ha alcanzado un éxito notable en el establecimiento de operantes verbales básicas y avanzadas en personas con trastornos del desarrollo. El avance de aproximaciones conductuales a la psicoterapia, tales como la psicoterapia analítico-funcional, ha impulsado la aplicación de análisis operantes a la conducta

* Corresponding author. School of Psychology, The University of Auckland, Tamaki Campus, Private Bag 92019, 261 Morrin Rd, Auckland 1072, New Zealand.

E-mail address: j.virues-ortega@auckland.ac.nz (J. Virues-Ortega).

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verbal en adultos. Las psicoterapias analítico-conductuales se diferencian de la investigación experimental aplicada en análisis de conducta en varios aspectos: (a) ausencia de análisis moleculares de procesos conductuales usando metodología experimental de caso único, (b) uso limitado del análisis funcional y la intervención funcional, y (c) uso metafórico de conceptos y métodos clásicos. Los avances favorecidos por las psicoterapias conductuales podrían enriquecerse mediante la transferencia de resultados de investigación procedentes de la investigación aplicada experimental. El presente análisis ilustra cómo procesos conductuales demostrados en el contexto de la investigación experimental con personas con trastornos del desarrollo y discapacidad intelectual pueden ser relevantes a población adulta con desarrollo típico y pueden conducir a la transferencia de resultados entre ambas áreas. Nuestro análisis se centra en procesos verbales básicos que incluyen la ecoica, el mando, el tacto y las dinámicas intraverbales. Este enfoque podría facilitar el desarrollo de investigación programática traslacional en el ámbito de las psicoterapias conductuales.

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In our daily life we access what we wish by direct physical engagement with our environment: we open a tap to obtain water, sit on a chair to rest our legs, cover our ears to protect ourselves from noise, and so forth. However, direct interaction with the physical environment accounts only for a fraction of operant human behavior. Specifically, we frequently achieve desirable outcomes through the mediation of others: we send e-mails expecting them to be read, we knock on doors in order to be let in, ask for favors, confess sins, and the like. Operant behavior maintained by the mediation of other people has been often acknowledged as a definition of verbal behavior (Skinner, 1957). Behavioral psychotherapies such as functional-analytic psychotherapy and acceptance and commitment therapy present verbal behavior as any other form of operant behavior maintained ultimately by gaining access to reinforcing consequences (e.g., Hayes, Strosahl, & Wilson, 1999; Kohlenberg & Tsai, 1991; Luciano, Pérez-Blarrina, & Valdivia-Salas, 2010).

For example, highly intense crying by a baby may be maintained by the food, comfort, and attention provided by her mother contingent upon intense crying. Similarly, the delusional statements of a client diagnosed with schizophrenia may be maintained by the responses of his social environment (e.g., attention from caregivers). Numerous empirical studies have validated specific aspects of the functional analysis of verbal behavior as originally presented by Skinner (1957). This body of evidence has primarily focused on the acquisition of basic verbal operants in individuals with language delays and, to a lesser extent, the acquisition of verbal operants in children of typical development (Greer & Ross, 2008; Virues-Ortega & Miguel, 2013).

There are behavioral approaches to adult psychotherapy that make extensive use of behavioral concepts. Acceptance and commitment therapy (ACT) presents the avoidance of aversive private stimuli (i.e., experiential avoidance) as a distinct behavioral function of multiple clinical disorders (Hayes et al., 1999). Likewise, functional-analytic psychotherapy (FAP) promotes the use of clinical observation in the context of client-therapist interaction as the basis for in-session functional analyses and real-time

implementation of social consequences upon clinically-relevant behaviors (Kohlenberg & Tsai, 1991). These approaches to psychotherapy have made extraordinary headway in the last 15 years. Yet, they present specific limitations. First, they have produced significant outcome literature, but limited process literature to validate the mechanisms that these interventions are said to mobilize. For example, the concept of verbal shaping in the context of verbal interaction between the client and the therapist has not been demonstrated using single-subject experimental evaluations for FAP. Second, their approach to the functional analysis of clinically-relevant behaviors is limited to specific behavior processes: derived responding and experiential avoidance in the case of ACT and within-session client-therapist interactions in the case of FAP. The standpoint introduced here attempts to supplement these approaches.

The verbal behavior and functional analysis literatures of individuals with developmental and intellectual disabilities have in large part, developed independently from clinical behavior analysis (Virues-Ortega & Miguel, 2013; Virues-Ortega, Rodríguez, & Yu, 2014; Wightman, Julio, & Virues-Ortega, 2014). The intent of the present conceptual analysis is to illustrate how the corpus of evidence of the applied experimental literature in the field of behavior analysis presents opportunities for clinical behavior analysis. This approach could expand our understanding of the functional relations and verbal behavior dynamics occurring in clinical contexts.

In this article, we will illustrate this translational approach by focusing primarily, but not exclusively, on the experimental research on language acquisition from the applied behavior analysis literature. For the purposes of brevity and didactic simplicity, we will discuss only fundamental verbal processes. The main aim of this analysis is to promote greater interaction between the various branches of behavior analysis. This approach is based on clinical observations and not on empirical research. Thus we will refrain from making direct recommendations. A fully translational study would require confirmation of the hypotheses presented here as a conceptual analysis.

A unit of analysis

The functional analysis of verbal behavior scrutinizes language using the same set of behavioral principles commonly used for motor behaviors. Thus, we will analyze verbal behavior using three- or four-term contingencies. The former is comprised of the current environment (discriminative stimuli), a verbal response, and social, sensory or cognitive consequence to that verbal response, while the latter incorporates motivating operations or factors that may alter the relation between the response and its consequences (Laraway, Snyckerski, Michael, & Poling, 2003). The addition of multiple contingency relations could account for the complexity of clinical phenomena including multiple causal factors, interactive causality, moderating and mediating variables, contextual issues, multimodal (e.g., biological, cognitive) influences, and the dynamic nature of functional relations (see for instance Haynes, Smith, & Hunsley, 2011). Nonetheless, the examples presented here, albeit based on real clinical cases, have been intentionally kept as simple and lineal as possible.

A translational approach to basic verbal processes

There is a taxonomy of three and four-term contingencies of fundamental verbal behavior processes commonly referred to as verbal operants. The behavioral literature on developmental and intellectual disabilities has demonstrated that, when absent, verbal operants can be established by arranging antecedents and consequences systematically. We will discuss some of this literature in the sections below from a translational perspective.

Two players in a verbal exchange: The speaker and the listener

A verbal operant involves a single exchange between a speaker producing a verbal response and a listener reacting upon the verbal response of the speaker. The response of the listener is signaled by the behavior of the speaker and often, but not always, reinforces the behavior of the speaker. For example, Manuel, a 55-year old man with depression, frequently vocalizes statements that describe him as worthless. These vocalizations are often followed by statements of reassurance from his partner Olivia:

- *Manuel*: I get older everyday. I have nothing to look forward to other than being ignored and forgotten.
- *Olivia*: That is not true dear. Your family loves you.
- *Manuel*: You are the only one.
- *Olivia*: Come on, you know that that's not true.

In this brief episode, Manuel's first statement is a speaker's response followed by a listener's response (Olivia's), which reinforces Manuel's initial utterance. Interestingly, Manuel also behaves as listener towards Olivia's first response. As seen in the example, the roles of speaker and listener change continuously during a verbal episode (Lodhi & Greer, 1989). Communication can only be

established when all individuals in a verbal exchange behave both as speaker and listener.

We can analyze this verbal episode further by using three-term contingencies. If we take Olivia's perspective, Manuel's initial response ("I get older every day...") would be a discriminative stimulus signaling that a particular verbal class (i.e., statements of reassurance such as: "That is not true dear...") is likely to be followed by some form of generalized social reinforcement ("You are the only one"). In a clinical context, verbal episodes are usually analyzed taking an arbitrary verbalization of the therapist as the initial point of analysis. This approach is arbitrary as verbal operants are frequently sequenced in long chains. Experimental evidence from the developmental disability and verbal behavior acquisition literatures reveals that these two repertoires are acquired independently: having one does not entail the occurrence of the other (Pérez-González, García-Conde, & Carnerero, 2011; Ribeiro, Elias, Goyos, & Miguel, 2010). This evidence has some potential clinical implications. It suggests that speaker and listener repertoires need to be developed and reinforced independently. While all typical adults have speaker and listener repertoires to various degrees, they are often asymmetrical. Various clinical problems might involve notorious speaker repertoire limitations (e.g., paranoid ideation, social skills deficits, selective mutism), while for others, restrictions in the listener repertoire might be more prominent (e.g., too strict or too lax instruction-following, alexithymia).

The echoic

The echoic is a verbal operant composed of a vocal response with point-to-point correspondence to a verbal antecedent and is maintained by social consequences. For example, a student repeating a word exactly as the teacher models it (Teacher: "Say the word 'mountain'." Student: "Mountain."). In spite of being among the first verbal operants to be acquired, echoics remain central to a number of daily life and clinical contexts. For instance, repeating a sentence to facilitate a delayed response to a verbal antecedent that is no longer present (e.g., trying to memorize a word or number we just heard by repeating it), learning a listener's response that would benefit from a more extended exposure to the verbal antecedent (e.g., repeating a sentence several times trying to "understand" it), or trying to optimize point-to-point correspondence for a not yet fully acquired vocal form (e.g., repeating a new word until we can pronounce it correctly).

There is significant evidence from the applied experimental literature on verbal acquisition suggesting that the echoic can facilitate the acquisition of more advanced and complex verbal operants such as mands, tacts, or intraverbals (e.g., Goldsmith, LeBlanc, & Sautter, 2007). This finding may have some implications for the functional analysis of verbal behavior in clinical settings. Being able to echo statements coming from the therapist or from the client's social environment might be an important skill to recall these statements or to establish important responses that would later become intraverbals. For example, a client with social skills deficit in the context of abusive behavior from others may be more likely to respond effectively after an adaptive

vocal response has been echoed and rehearsed from a competent model (e.g., "Leave me alone, I won't do it!"). In this respect, the applied research in developmental disabilities suggests that the echoic is often a form of temporary scaffolding (i.e., echoic prompt) for more advanced verbal operants that when established, result in the echoic gradually fading away.

The mand

The mand is a verbal operant under the control of a motivating factor and maintained by a specific stimulus delivered by the listener. For example, asking for water (mand) when thirsty (motivating factor) is likely to result in the presentation of water (specific reinforcer). The motivating factor temporarily alters the reinforcing value of the stimulus that maintains the mand (Laraway et al., 2003).

Motivating factors affecting the mand are greatly varied. For example, the reinforcing value of water may increase as a function of the ingestion of salty appetizers. In this example, ingesting salty appetizers motivates water ingestion. In a more clinically relevant example, social approval may work as a strong reinforcer for an adult deprived from peer approval and positive social exchanges. By contrast, motivating factors can also abolish a reinforcer. For example, studies evaluating the functional role of certain psychotropic drugs have shown that stimulant medication can abolish the reinforcing properties of some social stimuli (peer-play) in children with ADHD (LaRue et al., 2008).

The mand has been elaborated from a clinical behavior analysis perspective by the FAP (Kohlenberg & Tsai, 1991). However, a translational approach from the applied experimental literature may still provide novel insights into the clinical implications of the mand. In populations with developmental disabilities, a range of problem behaviors can be approached as inappropriate mands, that is, problem behaviors that provide access to specific reinforcers, such as special types of attention or removal of non-preferred activities (Wightman et al., 2014). Similarly, inappropriate mands are likely to be encountered in typical adults. Interestingly, an array of psychiatric terms suggests the presence of inappropriate mands. For example, common psychiatric and psychological labels such as "acting out," "attention seeking," "dependent personality," or "Munchäusen syndrome," all refer to patterns of behavior defined by the presence of inappropriate mands, i.e., clinically relevant behaviors likely to be maintained by specific forms of attention from others.¹

¹ In this context attention is narrowly defined as any kind of response from a third party. The exact form of attention that may be reinforcing for a particular individual is often idiosyncratic and has to be assessed on an individual basis as the experimental functional analysis literature suggests (Richman & Hagopian, 1999; Roscoe, Kindle, & Pence, 2010). Note that inappropriate mands are also called disguised mands by Kohlenberg and Tsai (1991), but in the context of the client-therapist interaction. For example, Manduchi and Schoendorff (2012) referred a case of disguised mand when "Luciana looked straight into her therapist's eyes and declared: 'You understand me...' The therapist felt the meaning was that she had an obligation always to 'understand,' which made her

The analysis of motivating factors is central to the understanding of adult clinical behavior. For example, intense negative emotional or physiological responses such as depression, stress, or pain, may function as motivating factors that abolish the effect of preexisting reinforcers on behavior. Therefore, individuals under their influence are less likely to engage in behavior that was previously followed by reinforcement, such as leisure activities (see for instance Misra & McKean, 2000). Moreover, long term exposure to motivating factors such as "depressive mood" can result in the phenomenon sometimes referred to as "forgetting the reinforcer" or "forgetting the contingency" (Martin & Pear, 2014), which could result in low rates of certain classes of operant behavior even after the motivating factor is no longer in effect.

Similarly, individuals that are responsive to a short collection of reinforcers are likely to become satiated (i.e., the reinforcer loses its value) of them or exhibit a low rate of reinforced behavior when a particular reinforcer is no longer available. An example of this would be an individual with a restricted off-work social network becoming depressed after retirement, or an individual becoming depressed after an injury that prevents him from engaging in his only hobby (e.g., playing golf). Low frequency of manding behavior could suggest that people under the influence of specific motivating factors warrant further clinical exploration. This interpretation is consistent with the mediating role of reinforcement on depression (e.g., Carvalho & Hopko, 2011).

The development of a comprehensive technology for the identification of the reinforcers that maintain clinically-significant behaviors remains an important challenge of behavioral psychotherapies. For example, FAP focuses on the therapist as the central source for reinforcement, but pays less attention to the reinforcers outside the session. Even if we assume that the therapist is the central source of reinforcement during client-therapist interaction, we still know very little about the behavioral process through which the therapist becomes a generalized source of social reinforcement. In this connection, the need for a methodology for assessing preferences and reinforcers may be a potential area for translational research, for this methodology is well-developed in the applied experimental literature on developmental and intellectual disabilities. The evaluation of preferences toward leisure and social stimuli may be transferable with minor modifications to the adult population (see for example Virues-Ortega, Hurtado-Parrado, Cox, & Pear, 2014).

The tact

The tact is a verbal operant under the control of nonverbal antecedents (e.g., object, event, abstract characteristics of the physical and social environment) and is maintained by social consequences. Nouns such as "apple," "inflation," "sadness," or "personality" frequently function as tacts. Tacting is a speaker's response that requires the mediation of a listener who is able to provide social reinforcement.

apprehend what would happen if she ever failed to provide such understanding" (p. 74).

Let us consider the process of learning the names of novel objects. For example, a teacher presents photos of different trees and prompts her students to produce the name of the trees and praises them for uttering correct responses. This example illustrates the basic features of tacting: the teacher used nonverbal stimuli (photos of trees) that served as antecedents for specific verbal responses (names of trees) followed by social consequences in the form of praise. In a clinical example, Lucas' therapist hypothesizes that his tendency toward dependent relations is the result of an inability to verbalize his personal preferences and goals. His therapist has designed an intervention aimed specifically at expanding a particular tacting repertoire: verbalizations describing preferences and personal short and long-term goals.

The tacting repertoire of an individual determines the nature and the quality of his interaction with the environment. An ample tacting repertoire provides the speaker with a wide range of resources to interact with his or her environment and obtain reinforcement from a range of audiences. This is epitomized in Wittgenstein aphorism, "[t]he limits of my language signify the limits of my world" (1922, § 5.6) (cf. "the limits of my tacting repertoire are the limits of my ability to interact with the environment").

The experimental literature with children with and without disabilities provides evidence for a close relation between the tacting and manding repertoires. Specifically, mand training may facilitate the acquisition of tacts (Egan & Barnes-Holmes, 2009). This literature may have some relevance to clinical work with adults. Specifically, in adult populations, tacting may be a prerequisite for manding, which could be a desirable outcome in many clinical contexts. In Lucas' example, he would be more likely to mand for his preferences and goals (e.g., "I do not want to go to the movies, I would prefer to go to the theater"), after an appropriate tacting repertoire for personal preferences and goals has been established.

Further, many clinical problems seem to be the result of poor tact relations with the physical and social environments. Inaccurate tacts are present as part of the defining features of diagnostic labels such as schizophrenia, depression, and anorexia (e.g., a young female with a body mass index of 16 describing her body as "fat;" an adult tacting a stomachache as "having a bomb in my stomach"). Interestingly, idiosyncratic tacts, albeit not shared by the verbal community, may still be reinforced by it. In fact, there is evidence in the applied experimental literature that specific responses from the client's social environment can maintain delusional verbalizations (see for instance Travis & Sturme, 2010).

An additional mechanism through which inaccurate tacting may be maintained results from the speaker behaving as his or her own listener. Verbally competent individuals can react upon and modify their own verbal behavior in order to access reinforcers or reduce aversive stimulation. This complex process has been discussed in the context of advanced verbal training in individuals with learning disabilities (Greer & Ross, 2008). However, it may be a process contributing to highly idiosyncratic forms of verbal behavior in typically developed adults such as delusions. Delusional verbalizations present many attributes that are consistent with a long history of verbal exchanges where the speaker has functioned as the primary audience. Some of these attributes

include the progressive sophistication of delusions overtime, their relation with the immediate social environment of the individual (Myin-Germeys, Nicolson, & Delepaul, 2001), and the high prevalence of delusional ideation in the nonclinical population (Freeman, 2006). For example, the delusional behavior of a client describing his boss as the devil might have been preceded as an indistinct avoidance toward the work environment and the presence of tacts about the existence of the supernatural accepted or even encouraged by his social niche. Complex speaker-listener exchanges such as the one suggested here are better described in terms of intraverbal dynamics.

Intraverbal dynamics

The intraverbal is a verbal operant composed of a verbal response anteceded by a verbalization from another speaker and maintained by the social response provided by a listener. Engaging in conversation, answering questions, or interacting verbally with a client are activities that may be characterized as sequences of intraverbals. The applied experimental literature with people with and without developmental disabilities suggests that basic behavior processes such as matching, shaping, and chaining are often embedded in intraverbal exchanges.

An experimental analysis by Borrero et al. (2007) demonstrated that social reinforcement in the form of attention could predict quantitative aspects of the speaker's behavior. The authors asked participants to express opinions about different topics while a confederate was instructed by the experimenter to moderate the session by expressing agreement or disagreement with each individual at different frequencies. The results showed that the rate of social reinforcement explained the rate of verbalizations aligning with the moderator's opinions. The relationship between rate of reinforcement and rate of behavior followed a matching equation that has been well validated in the basic and applied experimental literatures. While the study did not specifically track verbal shaping processes, it illustrated how verbal responses, at least under certain social settings, tend to maximize access to reinforcement. In the context of skills that are already acquired (cf. expressed opinions about various topics), response allocation may accommodate a matching relation, while in the context of skills that are being acquired (cf., acquisition of verbal classes consistent with psychotherapeutic goals in Froján-Parga, Ruiz-Sancho, & Calero-Elvira, 2014), behavior changes may be better characterized by way of a shaping process.

Verbal shaping comprises the delivery of differential consequences to responses meeting a series of behavior criteria arranged in gradual approximations to a final verbal performance. During the shaping process, (a) reinforcers are delivered following the occurrence of behavior that meets a temporary criterion for reinforcement and (b) reinforcing consequences for verbal performances not meeting the criteria or meeting earlier interim criteria are withheld—these are said to be on extinction. Shaping may have a significant role in the acquisition of the first echoes when articulatory accuracy is being established. For example, adults are likely to downgrade vocal models while engaging in infant-oriented speech in order to increase the

likelihood of reinforcement of infant vocalizations (see for instance [Pelaez, Virues-Ortega, & Gewirtz, 2012](#)). Similarly, practitioners are turning to use phonetic transcriptions to shape vocal production in children with autism ([Ventrella, Albert, & Carbone, 2010](#)).

Verbal shaping may not only be relevant to the acquisition of new vocalizations or words, but also to the acquisition of complex verbal operants and response classes. For instance, verbal shaping has been used to encourage uttering specific types of nouns, pronouns, suffixes, verbs, or semantic categories (e.g., [Speckman, Greer, & Rivera-Valdes, 2012](#)). Many have suggested that verbal shaping may be an active component of psychotherapy ([Busch et al., 2009](#); [Virues-Ortega, Montaña-Fidalgo, Froján-Parga, & Calero-Elvira, 2011](#)). For example, in functional-analytic psychotherapy the therapist provides social reinforcement upon clinically-relevant social behavior hoping that within-session contingencies will carry through to the client's natural environment. Identifying this process as verbal shaping is to some extent a metaphor as the extinction of just-reinforced performances rarely occurs—i.e., the therapist may still provide some social reinforcement to below-target verbalizations albeit at a thinner schedule, or with social reinforcers of a lesser magnitude and quality. Moreover, *stricto sensu*, shaping progresses through specific dimensions of the target verbal response such as its form, latency, and degree of response independence. By contrast, that which is being reinforced may change constantly in psychotherapy (see for example [Follete & Bonow, 2009](#)) and an arguably infinite set of verbal forms may still result in the same level of reinforcement. For example, at a given point in time the verbal response of a client, "I concede that my sister might have been right about my reaction being out of line," may receive the same level of reinforcement than the response, "Not returning John's phone call was an overreaction on my part."

Clinical interaction sequences of intraverbals are often part of greater units of intraverbal chains where a sequence of intraverbals leads to a "terminal" social reinforcer with interim conditioned verbal reinforcers on the part of the therapist. An example of this is an excerpt of Socratic debate where multiple client-therapist exchanges may be needed before the therapist can deliver some form of verbal approval. Social network analyses of the sequence of therapists' verbalization during session suggest that intraverbal chaining may be a prevalent process during clinical interaction ([Virues-Ortega et al., 2011](#); see an alternative approaches to in-session verbal exchanges in [Frojan-Parga, Ruiz-Sancho, & Calero-Elvira, 2014](#); [Piñar, Caro, & Coscollá, 2001](#)).

In sum, client-therapist exchanges can be described, and possibly explained, in terms of intraverbal dynamics including intraverbal matching, intraverbal shaping, and intraverbal chaining. Matching, shaping, and chaining are behavioral processes that have been studied at length in the applied experimental literature. Thus, there might be a multitude of translational lessons to be learned from these behavior processes. For example, there is a number of experimental evaluations of backstepping procedures for shaping in the event of the client not reaching a pre-established criterion for reinforcement (see for example percentile shaping, fixed-outcome shaping, variable-outcome shaping, algorithmic shaping; [Galbicka,](#)

[1994](#); [Hall, Maynes, & Reiss, 2009](#)). These procedures point to many research avenues potentially leading to useful clinical resources to recapture the client's verbal behavior on occasions where little progress is being made.

Conclusion

Research with individuals with disabilities generally focuses on relatively simple behaviors (e.g., self-injurious behavior, acquisition of mands) that are unlikely to be influenced by advanced verbal processes and complex learning histories that may disguise the relation between the behavior and its social environment. As a result, single-subject experimental demonstrations are possible. These research designs are often not suitable to clinical research with typical adults. Thus, the applied behavior analysis literature with developmental and intellectual disability populations may be an excellent, but often unintended, model for clinical behavior analysis in typical adults.

The therapeutic relationship is a social context capable of evoking and modifying the client's behavior. Thus, a functional analysis of the client-therapist verbal interaction could help to identify language-mediated learning processes that result in changes of behavior. Experimental analyses of verbal behavior have been successful in establishing basic and advanced verbal operants in individuals with developmental disabilities. We have presented some verbal behavior processes based on the applied experimental literature with these populations that are likely to occur during clinical interaction with typical adults. The evaluation and implementation of these processes may result in a number of clinical recommendations that could optimize the effects of psychotherapy once sufficient translational research is available. We have focused on basic processes that have not been fully elaborated by well-established behavioral psychotherapies. We argue that these models of intervention may benefit from the translational approach suggested here. Increasing interaction within the branches of behavior analysis is a major trend within this field ([Virues-Ortega et al., 2014a](#)). A new translational path that is yet to be taken involves the evaluation of those potential lessons taught by the assessment and treatment literatures in people with developmental and intellectual disability where most of the experimental research in behavior analysis has been conducted. This approach could generate many hypotheses pertaining to the client-therapist verbal interaction in psychology.

References

- Borrero, J. C., Crisolo, S. S., Tu, Q., Rieland, W. A., Ross, N. A., Francisco, M. T., & Yamamoto, K. Y. (2007). *An application of the matching law to social dynamics*. *Journal of Applied Behavior Analysis, 40*, 589–601.
- 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, 40*, 280–290.
- Carvalho, J. P., & Hopko, D. R. (2011). *Behavioral theory of depression: Reinforcement as a mediating variable between avoidance and depression*. *Journal of Behavior Therapy and Experimental Psychiatry, 42*, 154–162.

- Egan, C. E., & Barnes-Holmes, D. (2009). Emergence of tacts following mand training in young children with autism. *Journal of Applied Behavior Analysis, 42*, 691–696.
- Follete, W. C., & Bonow, J. T. (2009). The challenge of understanding process in clinical behavior analysis: The case of functional analytic psychotherapy. *The Behavior Analyst, 32*, 135–148.
- Freeman, D. (2006). Delusions in the nonclinical population. *Current Psychiatry Reports, 8*, 191–204.
- Froján-Parga, M. X., Ruiz-Sancho, E. M., & Calero-Elvira, A. (2014). A theoretical and methodological proposal for the descriptive assessment of therapeutic interactions. *Psychotherapy Research [Advance Online Publication]*.
- Galbicka, G. (1994). Shaping in the 21st century: Moving percentile schedules into applied settings. *Journal of Applied Behavior Analysis, 27*, 739–760.
- Goldsmith, T. R., LeBlanc, L. A., & Sautter, R. A. (2007). Teaching intraverbal behavior to children with autism. *Research in Autism Spectrum Disorders, 1*, 1–13.
- Greer, R. D., & Ross, D. E. (2008). Verbal behavior analysis: Inducing and expanding new verbal capabilities in children with language delays. Boston: Allyn & Bacon.
- Hall, S. S., Maynes, N. P., & Reiss, A. L. (2009). Using percentile schedules to increase eye contact in children with fragile X syndrome. *Journal of Applied Behavior Analysis, 42*, 171–176.
- Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Haynes, S. N., Smith, G. T., & Hunsley, J. D. (2011). *Scientific foundations of clinical assessment*. New York: Routledge.
- Kohlenberg, R. J., & Tsai, M. (1991). *Functional Analytic Psychotherapy: A guide for creating intense and curative therapeutic relationships*. New York: Plenum.
- Laraway, S., Snyckerski, S., Michael, J., & Poling, A. (2003). Motivating operations and terms to describe them: Some further refinements. *Journal of Applied Behavior Analysis, 36*, 407–414.
- LaRue, R. H., Northup, J., Baumeister, A. A., Hawkins, M. F., Seale, L., Williams, T., & Ridgway, A. (2008). An evaluation of stimulant medication on the reinforcing effects of play. *Journal of Applied Behavior Analysis, 41*, 143–147.
- Lodhi, S., & Greer, R. D. (1989). The speaker as listener. *Journal of the Experimental Analysis of Behavior, 51*, 353–359.
- Luciano, C., Páez-Blarrina, M., & Valdivia-Salas, S. (2010). Acceptance and commitment therapy (ACT) in drug abuse as a experiential avoidance strategy. *International Journal of Clinical and Health Psychology, 10*, 141–165.
- Martin, G. P., & Pear, J. J. (2014). *Behavior Modification: What it is and how to do it* (10th ed.). Upper Saddle River, NJ: Pearson.
- Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American Journal of Health Studies, 16*, 41–51.
- Myin-Germeyns, I., Nicolson, N., & Delespaul, P. (2001). The context of delusional experiences in the daily life of patients with schizophrenia. *Psychological Medicine, 31*, 489–498.
- Pelaez, M., Virues-Ortega, J., & Gewirtz, J. (2012). Acquisition of social referencing via discrimination training in infants. *Journal of Applied Behavior Analysis, 45*, 23–36.
- Pérez-González, L., García-Conde, A., & Carnerero, J. (2011). Naming completo con estímulos abstractos bidimensionales en niños de seis años. *Psicothema, 23*, 719–724.
- Piñar, M. J., Caro, I., & Coscollá, A. (2001). Modos de respuesta verbal: Describiendo el habla en pacientes y terapeutas. *International Journal of Clinical and Health Psychology, 1*, 237–257.
- Ribeiro, D. M., Elias, N., Goyos, C., & Miguel, C. F. (2010). The effects of listener training on the emergence of tact and mand signs by individuals with intellectual disabilities. *Analysis of Verbal Behavior, 26*, 65–72.
- Richman, D., & Hagopian, L. (1999). On the effects of quality of attention in the functional analysis of destructive behavior. *Research in Developmental Disabilities, 20*, 51–62.
- Roscoe, E., Kindler, A., & Pence, S. (2010). Functional analysis and treatment of aggression maintained by preferred conversational topics. *Journal of Applied Behaviour Analysis, 43*, 723–727.
- Skinner, B. F. (1957). *Verbal behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Speckman, J., Greer, R., & Rivera-Valdes, C. (2012). Multiple exemplar instruction and the emergence of generative production of suffixes as autoclitic frames. *Analysis of Verbal Behavior, 28*, 83–99.
- Travis, R., & Sturmey, P. (2010). Functional analysis and treatment of the delusional statements of a man with multiple disabilities: A four-year follow-up. *Journal of Applied Behavior Analysis, 43*, 745–749.
- Ventrella, H., Albert, K., & Carbone, V. (May, 2010). Shaping vocal production of a child with autism. Paper presented at the 36th Annual Conference of the Association for Behavior Analysis International. San Antonio, TX.
- Virues-Ortega, J., Hurtado-Parrado, J., Cox, A., & Pear, J. (2014). A systematic analysis of the interaction between experimental and applied behavior analysis. *Journal of Applied Behavior Analysis, 47*, 1–24.
- Virues-Ortega, J., & Miguel, C. (2013). Functional analysis of language. In R. G. Miltenberger (Ed.), *Modificación de Conducta* (5th ed., pp. 483–501). Madrid: Pirámide.
- Virues-Ortega, J., Montaña-Fidalgo, M., Froján-Parga, M., & Calero-Elvira, A. (2011). Descriptive Analysis of the Verbal Behavior of a Therapist: A Known-Group Validity Analysis of the Putative Behavioral Functions Involved in Clinical Interaction. *Behavior Therapy, 42*, 547–559.
- Virues-Ortega, J., Pritchard, K., Grant, R., North, S., Hurtado-Parrado, C., Lee, M., Temple, B., Julio, F., & Yu, C. T. (2014). Clinical decision-making and preference assessment for individuals with intellectual and developmental disabilities. *American Journal on Intellectual and Developmental Disability, 119*, 151–170.
- Virues-Ortega, J., Rodríguez, V., & Yu, C. T. (2014). Prediction of treatment outcomes and longitudinal analysis in children with autism undergoing intensive behavioral intervention. *International Journal of Clinical and Health Psychology, 13*, 91–100.
- Wightman, J., Julio, F., & Virues-Ortega, J. (2014). Advances in the indirect, descriptive, and experimental approaches to the functional analysis of problem behavior. *Psicothema, 24*, 186–192.
- Wittgenstein, L. (1922). *Tractatus Logico-Philosophicus*. New York: Harcourt, Brace & Company.

Further reading

- Manduchi, K., & Schoenforff, B. (2012). First steps in FAP: Experiences of beginning functional analytic psychotherapy therapist with an obsessive-compulsive personality disorder client. *International Journal of Behavioral Consultation and Therapy, 7*, 72–77.