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SPECIAL ISSUE ON SOCRATIC DIALOGUE

Verbal Change and Cognitive Change: Conceptual and Methodological Analysis for the Study of Cognitive Restructuring Using the Socratic Dialog

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Abstract In this paper, we will firstly delve in a behaviorally rooted theoretical analysis of the learning processes that could be involved in the employment of Socratic dialog as a means to achieve cognitive restructuring. Three observers analyzed the case of study attending to the client–therapist interaction during the cognitive restructuring using the Socratic method. Different types of Discriminative Stimulus–Response–Reinforcement interaction sequences were specified during the debate and after the client's pro-therapeutic verbalizations. A progressive increase in the frequency of pro-therapeutic verbalizations was observed. Taking into account the limitations of a case study, our results seem to fit those obtained in previous studies and suggest a possible explanation of the therapeutic process in general and the Socratic method in particular (at least as it is employed here) in terms of verbal shaping and verbal chaining. These processes would lead to the learning of rational thoughts which, in turn, would guide the client's overt behavior to make it more pro-therapeutic.

Keywords Socratic method · Behaviorist standpoint · Client–therapist interaction · Verbal shaping · Verbal chaining

Introduction

Cognitive behavior modification or cognitive therapy originated in the mid-1970s; according to some authors, its theoretical basis is to be found in methodological

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behaviorism (Hayes et al. 1995; Pérez 1996a, b) or in some models of cognitive behavior like the information processing model (Beck 1995; Mahoney 1974; Sacco and Beck 1995). It shares with the latter the conceptualization of man as an active processor of surrounding information: The information that reaches this processor is first acquired, then transformed into complex codes, and finally stored until it is retrieved and used in an activity.

The main characteristic of cognitive behavior modification is the importance it gives to cognitive processes in the development, maintenance, and modification of problem behaviors (Caro 2011; Kazdin 1978; Mahoney 1974; Robins and Hayes 1995). The explanation of behavior usually depends more on the individuals' perception of their surrounding events than in those events themselves: human beings filter, transform, and "build" the experiences that constitute their "reality" (Beck 1995; Caro 2011; Ellis 1995; Kazdin 1978; Robins and Hayes 1995). Cognitive behavior modification is interested in changing problem behavior through the modification of thought processes. In order for this change to be stable—that is, not situation-dependent—cognitive change must affect cognitive structures (schemata, beliefs) more than specific thoughts (Caro 2011; Kazdin 1978; Robins and Hayes 1995). To change these structures, cognitive techniques employ linguistic tools that allow the clients to reassess their irrational beliefs and maladaptive mental schemata, thus changing their reactions to the world and themselves (Beck 1995; Caro 2011; Ellis 1995; Kazdin 1978).

In this regard, cognitive restructuring has been traditionally employed within the wider context of CBT to promote these cognitive changes. Among the various techniques that can be employed to bring about cognitive restructuring, the "Socratic dialog" is often employed. This technique consists in the concatenation of questions through which cognitive change is effected (Beck 1967; Beck et al. 1979; Bernard 1991; Dryden et al. 2003; Ellis 1962; Ellis and Grieger 1977; Kennerley 2007; McMullin and Giles 1981; Overholser 1993a, b, 1994, 1995, 1996, 1999; Padesky and Greenberg 1995; Wells 1997; Westbrook 2014). However, assuming this standpoint entails a series of problems that casts doubts on the rationale behind cognitive techniques (though not on their efficacy): Do these linguistic strategies really change the mental structures/schemata that allegedly underlie the client's problems? Or do they merely modify automatic thoughts (covert verbalizations), that being enough to completely solve the client's problems? It may seem that this last option oversimplifies not only cognitive techniques but also the complexity of human thought; nonetheless, a detailed analysis of the implications of this alternative point of view will allow us to see that it might be complex enough to constitute a full-fledged account of psychological change.

At its core, our standpoint stems from the consideration of cognitive factors as regular behaviors, subject to the same laws of learning than any other behavior (Freixa 2003; Holt 1915; Marr 1990; Ryle 1949; Skinner 1974), and thus modifiable through behavioral procedures that can be experimentally studied in the laboratory. Drawing from this identification between cognitive and behavioral factors, we will firstly delve in a theoretical analysis of the potential learning processes that could be involved in the employment of Socratic dialog during the cognitive restructuring. Our central assumption is that a combination of both verbal shaping and chaining processes lies at the (functional) core of this technique. These processes would lead to the learning of rational thoughts (covert verbalizations) which, in turn, would guide the client's overt

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behavior to make it more pro-therapeutic. In this regard, pro-therapeutic verbalizations are those positively related to clinical change and can be analyzed as pertaining to two different categories: compliance and well-being verbalizations (Calero-Elvira et al. 2013; Calero-Elvira et al. 2011b; Froján-Parga and Calero-Elvira 2011; Froján-Parga et al. 2006; Froján-Parga et al. 2009; Froján-Parga et al. 2010). This theoretical analysis will be supplemented with a case study intended to exemplify our standpoint. To that end, we will first start with a conceptual analysis of the mind and other mentalist notions and their relation with language and its multiple functions. Drawing from this philosophical framework, we will delve into the analysis of the relationship between the change in covert behavior and the "deeper" change in the alleged causes of psychological problems: mental schemata or mental structures.

Wittgenstein (1953) charges against the representationist conceptualization of language, which assumes that the meanings of words are learnt through acts of ostensive teaching (see also Arrington 1990; Deitz 1990; Primero 2002; Tomasini 2004, 2005). Ostensive teaching consists of learning situations in which a language expert (an adult) points at an object (e.g., an apple) and names it (i.e., utters "apple") in front of someone who is learning (a child). By means of that act of ostensive definition, the child acquires the meaning, the concept that is represented by the word the adult used to designate the object. Wittgenstein, however, points at the fact that this act of ostensive definition can only happen within the boundaries of language; the child needs to know the rules of this "language-game" beforehand to be able to establish the link between the word-sign, the gesture-sign and the referent object. Otherwise, it would be impossible for the novel speaker to distinguish the association between the word and its referent from any other possible association (e.g., apple—color red; apple—round shape, etc.; Arrington 1990; Tomasini 2004, 2005). Therefore, Wittgenstein equates the meaning of a term with its use; the child does not learn the names of things, but verbal behaviors that include those names and allow him to access the designated objects (Primero 2002). Given that all human beings learn language in the same way (i.e., "playing" the same language-games), there can be no "personal" or, in Wittgenstein's terms, "private" language. Therefore, it would be impossible for a person to express, for example, a sensation (e.g., pain) through a word (e.g., the word "pain") in such a way that the referent of the word were different from the referent that another person names with the word pain. Consequently, Wittgenstein's argument (1953) supports the notion of a functional equivalence between the covert event that constitutes the referent (e.g., feeling pain) and its public denomination (e.g., the word pain). This standpoint allows for the interpretation of the supposed cognitive causes of behavior (i.e., mental schemata) in terms of covert or overt behavior (both linguistic and non-linguistic): We could explain a person's behavior by exclusively referring to what they do or say (including their verbalized thoughts).

As we have seen, cognitivism assumes that thoughts are a manifestation of a supposedly underlying, internal, mental scheme. The problem is that this standpoint leads us to an essentially tautological theoretical model: using again the word pain as an example, when we use it we are referring to sensations that exist regardless of their naming; there *is*, in fact, a sensation that we learn to designate as pain. On the contrary, when the clients observe themselves following the therapist's instruction to do so, they do not observe the mental schemata that supposedly cause their automatic thoughts, but those thoughts themselves. It thus seems that the term "mental schema" only designates

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the thoughts that are verbalized by the clients, not their alleged inner cause. Therefore, the cognitive explanation of problem behavior is tautological; the only evidence we have to infer the inner explanatory mental scheme is the same behavior we aim to explain.

Contrary to this standpoint, the proposals made by radical behaviorism constitute a major theoretical advancement. Radical behaviorism does not deny the existence of covert phenomena, though it neither provides the sort of tautological argument mentioned above to explain them; rather, it goes to the root (hence the name "radical") of the psychological phenomenon: behavior, which is considered to be the object of study of psychology (Skinner 1974). From this perspective, the term "behavior" does not allude to the responses of an organism, but to the interaction between an organism and its environment, that is, the functional relation established between these responses and the stimuli that evoke or elicit them. In this regard, covert phenomena, as any other psychological phenomenon, could function either as responses or as stimuli.[1] This is what Skinner (1974) means when he asserts that the only difference between the "world outside the skin" and the world "within the skin" is a difference in the number of potential observers of behavior. When behavior is overt, manifest, it is public. However, when behavior is covert, it is private, which means it is only accessible to a single observer. But, this single observer can refer to these covert phenomena, by means of his/her linguistic and non-linguistic behavior. Thus, these covert phenomena are, in every other respect, exactly as "behavioral" as manifest behavior. Since Wittgenstein (1953), as we exposed earlier, had completely ruled out the possibility of the existence of a private language, it does not seem problematic at all to assert that therapists can in fact access their clients' covert behavior through what they say or do. This argument has an implicit assumption: that thought—or at least the kind of thought that can be conceived of as "inner speech"—is nothing but an "internalization" of audible speech (see Alcaraz 1990; Holt 1915; Mowrer 1954; Primero 2002; Skinner 1957; Varela 2008; Vygotsky 1962). The socio-linguistic environment shapes the children's audible speech and progressively teaches them to "talk to themselves"; inner speech thus appears as a natural outcome of ordinary learning processes. In fact, it would constitute a perfect example of what we could call "behavioral thrift" (Alcaraz 1990; Mowrer 1954; Skinner 1957; Varela 2008). But, the most interesting thing about this argument is that if covert phenomena are qualitatively identical to manifest behavior, why posit that the former causes the latter? (Freixa 2003; Ryle 1949; Skinner 1974; Varela 2008). There is, of course, one sense in which covert behavior "causes" manifest behavior. This is what happens, for example, when the kind of thoughts that we could call inner speech are the ones that elicit or evoke observable responses. But, those same thoughts can also be conceived of as responses, elicited, or evoked by environmental stimuli (from both the public and the private or covert environment). Consequently, the stimuli generated by the action of an organism in its environment can also constitute the cause of self-verbalizations (Marr 1990; Skinner 1953).

Under no circumstances could this mean that cognitive techniques in general and the Socratic dialog in particular are useless; rather, their efficacy is beyond any doubt (Brestan and Eyberg 1998; Calero-Elvira et al. 2011a; Caro 2011; Chambless et al. 1996, 1998;

[1] The allocation of the stimulus function or response function concerns only the researcher that is analyzing a specific behavioral segment and does not depend on the supposed nature of the behavioral events.

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Nathan and Gorman 2007). The greatest contribution of the cognitive standpoint was the systematization of verbal procedures for behavior modification in clinical settings at a time when behavioral psychology, for reasons that go beyond the scope of this paper, had abandoned the study of language as a potential driving force for psychological change. The problem with these techniques lies in the theoretical assumptions that attempt to explain their functioning (Calero-Elvira et al. 2013).

The study of language from a behavioral standpoint has been undertaken from the paradigms of classical and operant conditioning. Regarding classical conditioning, Pavlov first alluded to language as a second signaling system that could generate conditioning processes without a direct pairing with the unconditioned stimulus (Alcaraz 1990; Kazdin 1978; Skinner 1957). Within this same paradigm, Mowrer (1954) developed an explanatory theory of the possible relation between linguistic and physical events: Such relations, which he called "sentences," work as conditioned devices whose main effect is to produce new associations (i.e., new learning) and set meaning transference processes in motion. According to Mowrer, the meaning of a word is a set of responses that is elicited when the word is presented; meanings are transferred from event to event—whether these events are words (i.e., linguistic events) or things (i.e., physical events)—through classical conditioning processes. The new words associated were previously conditioned stimuli that had acquired their eliciting properties by means of previous classical conditioning processes; what Mowrer assumes is that, due to a new conditioning process, the meaning of a word is associated with the meaning of another. For example, in the sentence "Thomas is a thief," the set of sensory, autonomous, motor, etc. responses (i.e., the meaning) that is elicited by the word "thief" is associated with the set of sensory, autonomous, motor, etc. responses that was already elicited by the word "Thomas."

Mowrer's intention is to provide a full-fledged approach to one of the key functions of language: the referential function. This function is conceived of as the capacity of linguistic signs to point to the world, that is, to refer to objects, events and other phenomena that might or might not be physically present. We react to verbal descriptions in a similar way to the described events (Arrington 1990; Kazdin 1978; Ribes 1990; Vargas-de la Cruz 2011). The meaning transference processes proposed by Mowrer could explain why, through language, we can modify someone's behavior regarding certain environmental events, without the need for those events to be physically present. This fact has given rise, within the paradigm of operant behavior, to the study of "rule-governed behavior," so-called to differentiate it from the kind of behavior that is directly shaped by environmental contingencies (Baron and Galizio 1990; Malott et al. 1999; Miltenberger and Ortega 2012; Vargas-de la Cruz 2011). Aware of the risk of seeming excessively synthetic, we could say that when words acquire an appetitive or aversive meaning through conditioning, the stimuli complex word-meaning can itself acquire an operant function: a discriminative function for an approach or avoidance behavior, respectively (Baron and Galizio 1990; Malott et al. 1999; Miltenberger and Ortega 2012; Vargas-de la Cruz 2011). Following Mowrer (1954), if one associates the word Thomas with the word thief, the generated suspicion responses will easily discriminate a series of watchfulness or avoidance operant behaviors, even if Thomas has never stolen anything from me (environmental contingency).

This sort of combination of operant and classical conditioning can therefore account for verbal control of behavior. If we can observe verbal control in natural, non-

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programmed contexts, it is easy to conclude that therapists can promote it in controlled—though no less natural—clinical settings to induce stable therapeutic changes in the client's behavior. Linguistic techniques can thus be used by the therapist to modify inadequate verbal control (i.e., the dysfunctional and irrational thoughts with which the Socratic method deals) that might be at the root of problem behaviors. This approach will be specified in our explanation of the Socratic dialog in cognitive restructuring. We use here the term cognitive restructuring to refer to the set of therapeutic procedures aimed to help the clients identify their dysfunctional thoughts and verbalizations (i.e., those that produce ill-being and/or maladaptive behaviors), whether they are irrational or not, and replace them with more functional ones. These strategies may vary widely from the bare debate of the verbalizations between the therapist and the client during the clinical session to full-fledged theoretical and technical explanations (e.g., how thoughts affect one's emotional and behavioral experience, why certain thoughts are "dysfunctional" or "irrational", which are the main steps in the development of the applied restructuring technique and the in-session training of the debate strategy, etc.). Further, the assignment or review of the tasks that the client is intended to conduct at home as a supplement to other restructuring procedures can also be included. Among all these procedures, however, the debate plays a central role. Therefore, this paper focuses specifically on its analysis and evaluation.

There is no fully consensual or universally accepted definition of the Socratic method (Clark and Egan 2015). As Carey and Mullan (2004) highlight in their excellent review on the topic, there is a multiplicity of entangling confusions regarding the Socratic method; the great variety of names employed to designate it, along with the manifest absence of a commonly accepted definition, are just two of them. In this paper, we will interchangeably employ two of its most common denominations: Socratic method and Socratic dialog. Furthermore, it needs to be highlighted that this study is limited to an analysis of the Socratic method in cognitive restructuring. Indeed, further analysis of the employment of Socratic dialog generally within the therapy would be helpful. As many authors before have pointed out, the Socratic Method may be employed throughout all stages of treatment and within a wide variety of therapeutic tasks (see, for example, Kennerley 2007; Westbrook 2014). However, our study is not an analysis of the Socratic method outside cognitive restructuring.

Another usual controversy on the use of Socratic dialog in cognitive restructuring is whether its purpose is to provide information, to correct or to dispute the client's cognitions (Kazantzis et al. 2014). In this regard, there are two different approaches, each endorsed by different authors: The first one, known as *guided discovery*, was initially proposed by Beck et al. (1979) and later embraced by other authors, like Padesky (1993); these authors assume that the therapists should collaboratively guide patients without assuming the solution to their problems in advance. On the other hand, the second approach, known as *changing beliefs* or *persuasion*, was initially supported by Ellis and Grieger (1977); they believe that the therapist should strongly persuade the patient, thus leading to a possible solution to the questioning dialog. There is no evidence regarding which approach is more effective. Therefore, from our point of view, the Socratic method can apparently be employed either way. However, it is important to note that the Socratic debates shown in our study were carried out under

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the guidelines of the persuasion approach. This justifies the methodology employed in our study and gives sense to the idea that one could meaningfully provide a rating of the degree of approximation to the objective of the debate.

In previous studies, we found empirical support for the conceptualization of the Socratic dialog in cognitive restructuring as a process of change in the client's verbalizations due to a systematic combination of both verbal shaping and chaining processes. In our first studies, we developed and fine-tuned a category system that described the therapist's and the client's verbal behavior during the Socratic dialog in cognitive restructuring (Calero-Elvira et al. 2011b; Froján-Parga et al. 2006, 2009, 2011). Using our database of videotaped clinical sessions (Froján-Parga et al. 2010), we applied our observational system to analyze the client–therapist interaction components during the implementation of the Socratic dialog in cognitive restructuring. By means of detailed sequential analyses, we gathered empirical evidence consistent with the existence of a verbal shaping process during the use of the Socratic method in cognitive restructuring (Calero-Elvira et al. 2013). As far as we know, these were the first studies in which the client–therapist interaction during the implementation of the Socratic method was empirically analyzed in a moment-to-moment basis. These studies allowed us to show that the dialog established between the client and the therapist during the Socratic method in cognitive restructuring can be specified in a series of Discriminative Stimulus–Response–Reinforcement (Sd-R-R+) sequences. This will constitute the general framework for the analyses that are detailed below.

We will illustrate this point with an extremely simple description of a Socratic dialog. First, the therapist identifies (or helps the client identify) an irrational thought (i.e., a covert verbalization that is expressed in an overt verbalization, R_1). Next, the therapist makes a question to begin the questioning of R_1 (a re-evaluation question) which discriminates a new response from the client (R_2). Should R_2 approach the kind of verbalization that the therapist deems appropriate to achieve the goals of the session, he/she will emit a new re-evaluation question (a new *discriminative stimulus*), which will be followed by R_3 from the client. This continues until R_N appears (i.e., a pro-therapeutic verbalization uttered by the client that confirms that the goal of the Socratic dialog has been achieved). Each one of the questions emitted by the therapist functions as a discriminative for the following answer and as a reinforcer for the previous answer. However, we have verified in previous research that many of the client's responses that approach the goal of the debate are followed by an explicit verbal reinforcer emitted by the therapist. Thus, the client's verbalizations that originally referred to his or her dysfunctional behavior in problematic situations, gradually approach pro-therapeutic morphologies that refer to "healthier" behaviors that the client says he/she has done or will do (Calero-Elvira et al. 2013).

An expectable criticism could be that a change in the client's covert and overt verbalizations inside the clinic does not necessarily imply a behavioral change outside it. Generally, behavior therapists' stance regarding the "saying–doing" correspondence can be expressed as follows: "if the frequency with which people say they will do something (X) in a certain situation (Y) rises, so does the probability that people, in fact, do X when in Y." This is a regularity that has been verified in very different settings (Catania et al. 1989; Hayes et al. 1999b), and it provides evidence for the existence of a verbal control of behavior (or rule-governed behavior, as we earlier called it), as opposed to the control exerted by direct environmental contingencies

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(Hayes et al. 1986; Skinner 1969; Zettle and Hayes 1982). When we consider Mowrer's approach to meaning transference processes along with the operant research on verbal control of behavior, it is no longer mysterious how the therapist can change the client's problem behaviors that occur in non-clinical settings by means of verbal shaping and chaining procedures that modify the client's overt and covert verbalizations inside the clinical setting.

In order to empirically support this approach, our research team has carried out several studies on how the therapist employs the Socratic dialog to achieve cognitive restructuring, which were already cited above. Their results conjointly support the possibility to describe the Socratic dialog in terms of Sd-R-R+ sequences. This, in turn, allows us to propose the following hypotheses:

> Hypothesis 1: the new pro-therapeutic verbalizations emitted by the client after the Socratic method will increase in frequency in the following treatment sessions and will be reinforced by the therapist.
> Hypothesis 2: the increase in the client's pro-therapeutic verbalizations due to the debate will be related to an increase in the verbalizations that describe pro-therapeutic behaviors that were performed in extra-clinical contexts.

Method

Sample

In this study, a clinical case is presented. P. was a 32-year-old woman that requested individual psychological help due to the difficulties she was experiencing in her relationship. The client had a steady partner for the last 14 years, and they were living together. The intervention was carried out by a 44-year-old female therapist, with more than 15 years of experience in a private clinic, the Therapeutic Institute of Madrid (Spain). All clinical sessions were recorded with the client's consent, using a CCTV system.

Once the case was analyzed, the intervention objectives were operationalized. The implemented treatment was the cognitive–behavioral marital therapy (CBMT). This standardized and evidence-based psychological treatment (Chambless et al. 1996, 1998; Butler et al. 2006) included the employment of the Socratic dialog to promote cognitive restructuring, among other techniques. The procedure was thus chosen following the normative guidelines on evidence-based interventions (APA Presidential Task Force on Evidence-Based Practice 2006).

The treatment was carried out throughout ten sessions. Each one of them lasted for 1 h approximately. The first three were assessment sessions; the therapist used the fourth one to explain the client her functional analysis and the proposed treatment. Between sessions 5 and 10, the intervention program was implemented. It mainly consisted in the application of cognitive restructuring to modify the client's maladaptive verbalizations. These were related to various aspects of her relationship (jealousy and control behaviors, arguments with her partner, and negotiation of certain aspects of their coexistence) and to her partner's family. Once the changes in her verbalizations were achieved, the therapist instructed P. to engage in behavioral tasks to practice the

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achieved changes in her daily life. The sessions were set up weekly until session 6, when the schedule changed to one session every 2 weeks. Between sessions 9 and 10, the inter-session period was extended to 1 month. The intervention ended with the client discharge when the clinical goals were achieved, though no therapeutic adherence measures were conducted. These objectives are presented in Table 1.

Variables and Instruments

The variables that were analyzed in the clinical case are gathered in Table 2:

– Therapist's verbal behavior: the codification of the therapist's verbal behavior followed the *therapist system of categories*, *SISC-CVT*, developed in our previous studies (Calero-Elvira 2009; Calero-Elvira et al. 2011a, b; Calero-Elvira et al. 2013; Froján-Parga et al. 2008; Virués-Ortega et al. 2011). Cohen's kappa coefficient was employed to analyze inter-rater agreement. This coefficient was deemed the most appropriate since it controls for chance agreement and it follows a normal distribution, which facilitates its interpretation (Cohen 1960). Its values can be divided into poor ones (i.e., lower than 0.40), reasonable ones (i.e., 0.40–0.60), good ones (i.e., 0.60–0.75), and excellent ones (i.e., higher than 0.75) (see Bakeman 2000; Landis and Koch 1977). In this regard, the SISC-CVT has shown adequate inter-rater agreement levels (percentage of agreement among observers from 71 to 82%, Cohen's kappa from .65 to .76, $p < .01$; Calero-Elvira et al. 2013). The therapist's verbal behavior was coded on a moment-to-moment basis throughout all sessions.
– Client's verbal behavior: in this regard, two different category systems were used.

• The codification of the client's verbal behavior followed the *client system of categories*, *SISC-CVC*, developed in our previous studies. It also shows an adequate

Table 1 Therapeutic objectives

General objectives	Increasing her well-being Improving her relationship
Specific objectives	1. Eliminating jealousy and control behaviors: eliminating thoughts and emotions of insecurity and mistrust regarding her relationship, modifying irrational thoughts regarding romantic relationships, and eliminating checking behaviors with her partner 2. Sharing more enjoyable activities as a couple: P. must share activities that her partner enjoys and both must share more time together engaging in activities that both find enjoyable 3. Improving her relation with her partner's family: increasing interaction and making it more amiable 4. Reducing arguments and improving how P. expresses her annoyance or anger to her partner (reproaches, etc.) 5. Negotiating certain aspects of P.'s coexistence with her partner (economic issues, etc.)

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Table 2 Therapist and client verbal behavior category systems

Observed subject (moment)	Codes	Definition
Therapist (all along the therapy)	Discriminative	Verbalization by the therapist, typically a question, that evokes a client's response (verbal or otherwise). Explicit instructions, prompting, and motivational operations are excluded
	Reinforcement	Verbalization by the therapist showing approval, agreement, and/or acceptance of client's behavior
	Punishment	Verbalization by the therapist showing disapproval, rejection, and/or non-acceptance of client's behavior
	Informative	Verbalization by the therapist conveying technical or clinical knowledge to a non-expert person
	Motivational	Verbalization by the therapist that explicitly expresses the consequences that the client's behavior will have, is having, has had, or could have on clinical change
	Instructional	Verbalization by the therapist intended to increase the odds of a given behavior by the client happening in or out of the clinical context
Client (all along the therapy)	Pro-therapeutic verbalizations	Compliance: the client describes she has complied with a guideline proposed by the therapist
		Well-being: the client expresses her well-being or positive emotional reactions in relation to the therapeutic objectives
Client (Socratic method)	VAT	Any verbalization that approaches the therapeutic objective of the Socratic dialog
	VIT	Any verbalization intermediate with respect to the therapeutic objective of the Socratic dialog
	VOT	Any verbalization that opposes the therapeutic objective of the Socratic dialog

level of agreement (percentage of inter-rater agreement ranged from 72 to 91%, Cohen's kappa from .60 to .80, $p < .05$; Calero-Elvira et al. 2013; Ruiz 2011). The codification was also carried out on a moment-to-moment basis throughout all the sessions. Despite the employed system that is very complex and includes numerous categories, only those pro-therapeutic verbalizations uttered by the client throughout the treatment were coded for this study.

- Additionally, the SISC-COT system (category system for the observation of the client's verbal behavior as a function of the achievement of therapeutic goals; Calero-Elvira 2009; Calero-Elvira et al. 2011a, b; Calero-Elvira et al. 2013) was used to classify each one of the client's utterances according to their degree of approximation to the objectives of the debate. This system has already shown an adequate reliability (percentage of inter-rater agreement ranges from 60 to 86%; Cohen's kappa values range from .48 to .71, $p < .01$; Calero-Elvira et al. 2013). Again, the client's verbal behavior was coded on a moment-to-moment basis throughout all the Socratic method. The relevant fragments of the Socratic dialog were identified through previously developed guidelines (Calero-Elvira 2009). According to these guidelines, the Socratic method employed in cognitive

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restructuring is defined as a dialog between the therapist and the clients in which the former makes the latter reflect on the appropriateness of their cognitions in an attempt to modify their dysfunctional thoughts, mainly through questioning and disputational strategies.

The categories used to code the therapist's and the client's verbal behavior are also presented in Table 2. The software *The Observer XT* (Noldus Information Technology, version 11.0) was used for the observation and coding of the therapist's and the client's verbal behavior.

Procedure

This study was based on a clinical case that had been observed and coded in previous studies. The procedure of observation and moment-to-moment coding was described elsewhere (Calero-Elvira et al. 2013; Ruiz 2011). Therefore, in the following lines, we only describe the procedure used to perform the analyses for this case.

Three observers participated in this study, all of them blind to its purpose. The three of them were experts in behavior therapy and in the coding of verbal behavior (i.e., more than 100 h of training). The main observer was a clinician with a Master's Degree in Clinical Psychology and 6 years of clinical expertise. She was responsible for observing and coding all the client's verbalizations. The other two had a PhD in Clinical Psychology and 15 years of clinical expertise. They oversaw all the observation and analysis procedure, identified the therapeutic objectives, and developed the categories and criteria for the coding of pro-therapeutic verbalizations. This procedure can be divided in the following stages:

1. Case observation and analysis of the therapeutic objectives: the main observer first watched all the recordings of the case, pointing out the clinical objectives proposed by the therapist.
2. Classification of pro-therapeutic verbalizations (i.e., compliance and well-being): the observers agreed upon the criteria to be used in the classification. Verbalizations could be classified as compliance verbalizations (compliance with therapeutic tasks, i.e., P. said she had followed an instruction emitted by the therapist) or as well-being verbalizations (i.e., P. indicated her well-being or her positive emotional reactions regarding the therapeutic objectives).
3. Identification of pro-therapeutic verbalizations: based upon these criteria, the main observer identified and transcribed each of the moments in which P. uttered compliance and well-being verbalizations.
4. Data analysis: once the coding procedure was complete, data analyses were performed. Firstly, all three-term sequences (stimulus-response-stimulus) that occurred both during the debate episodes and at any other moment were identified and manually counted every time P. uttered a pro-therapeutic verbalization. These three-term sequences started with a verbalization emitted by the therapist, followed by a verbalization emitted by the client, which was in turn followed by another verbalization emitted by the therapist. All the hypothetical functions of the therapist's verbalizations could thus be analyzed afterwards. Finally, all the client's pro-therapeutic verbalizations (compliance and well-

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being) uttered in each session were identified, manually counted, and related to both the therapeutic objectives and the maladaptive verbalizations that had led to the debates.

Results

Functional Sequences in the Therapist-Client Interaction During the Socratic Dialog

The Socratic dialog was employed to achieve cognitive restructuring among different therapeutic objectives. In session 6, there was a debate regarding jealousy and control (objective 1). In sessions 6 and 7, the debate alluded to the client's relation with her partner's family (objective 3). Finally, in sessions 9 and 10, the debate was about the negotiation of different aspects of their coexistence (objective 5).

After analyzing the dialog of the debates, different types of interaction sequences could be specified. Six types of behavioral chains, which amounted to 40% of all interactions during the debate, were found. There were three different types of sequences in which the client's verbalization approached the therapeutic objective (VAT): sequences in which the therapist emitted *discriminative* verbalizations before and after the client's emission of VAT; sequences in which the therapist emitted *discriminative* verbalizations before and *reinforcing* verbalizations after the client's response; and sequences in which the therapist first *discriminated* and then emitted *other kind of verbalizations*. The most common sequences related to verbalizations opposed to the therapeutic objective (VOT) were *discriminating* before and after the client's response, *discriminating* before and *punishing* after and, finally, *discriminating* before and emitting *other kind of verbalizations* after. The other 60% of interaction sequences was very heterogeneous and corresponded to activities such as *informing*, giving *instructions* regarding tasks to be completed, or *motivating* the client to change. Examples of the most common interactions can be found in Tables 3 and 4.

Table 3 S-R-S interaction sequences in relation to the pro-therapeutic verbalizations emitted by the client throughout the therapeutic process, expressed in percentages and frequencies

S-R-S interaction sequences	Absolute frequency	Percent
Reinforcement–Pro-therapeutic V.[a]–Reinforcement	31	32%
Discriminative–Pro-therapeutic V.–Reinforcement	26	27%
Discriminative–Pro-therapeutic V.–Discriminative	15	15.4%
Reinforcement–Pro-therapeutic V.–Discriminative	6	6.2%
Other–Pro-therapeutic V.–Reinforcement	3	3.1%
Reinforcement–Pro-therapeutic V.–Other verbalizations	3	3.1%
Informative–Pro-therapeutic V.–Reinforcement	3	3.1%
Other sequences[b]	10	10.3%

[a] Pro-therapeutic V. indicates pro-therapeutic verbalization

[b] Other sequences indicate interaction sequences that occurred in two or less occasions each

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Table 4 Examples of the most frequent S-R-S interactions between the therapist and the client related to the pro-therapeutic verbalizations emitted by the client throughout the therapeutic process

S-R-S type of sequence	Examples
Reinforcement–Pro-therapeutic V.–Reinforcement	Session 7 example Therapeutic objective: 4. Arguments with her partner T: Good (responding to the client's description of how the argument with her partner would have been in other moment) C: Despite I felt like telling him, I didn't say anything T: Very good
Discriminative–Pro-therapeutic V.–Reinforcement	Session 7 example Therapeutic objective: 1. Jealousy and control T: And if he had done it, what would have happened? (if her partner had gone out) C: Well, nothing, I'd have had to accept it T: Perfect
Discriminative–Pro-therapeutic V.–Discriminative	Session 10 example Therapeutic objective: 3. Relation with her partner's family T: Did you say hello to her? (to one of her partner's family members with whom she has a strained relationship) C: Yes, I said hello, but we didn't have any contact beyond that T: And have you kept on having contact with his family?
Reinforcement–Pro-therapeutic V.–Discriminative	Session 6 example: Therapeutic objective: Couple general T: So both of you are calm, satisfied, good C: Yes, things are calm now, at least on my side, and on his side too, I feel good T: And what about his family?

Evolution of the Client's Pro-therapeutic Verbalizations After the Socratic Dialog and Analysis of the Therapist-Client Functional Sequences

Regarding the therapist's behavior before and after the client's utterance of pro-therapeutic verbalizations, it was found that the most common sequences that appeared during the sessions in which the therapist employed the Socratic method for cognitive restructuring were sequences in which the therapist *reinforces* before and after the client's pro-therapeutic verbalization (32%); sequences in which the therapist *discriminates* a verbal response by the client and, when the latter emits a pro-therapeutic verbalization, the former *reinforces* it (27%); and sequences in which the therapist *discriminates* verbal responses by the client before and after the latter's pro-therapeutic verbalizations (14.4%). Frequencies and percentages of all interaction sequences related to pro-therapeutic verbalizations can be found in Table 3; Table 4 shows examples of the most frequent interactions.

A progressive increase in the frequency of pro-therapeutic verbalizations is observed in the analysis. Their total frequency was 141 verbalizations throughout the therapy; 27 (19.15%) of them were emitted prior to the treatment (sessions one to four) and 114 (80.85%) during the treatment (sessions five to 10).

These data, along with data shown in Table 3, show evidence supporting the first hypothesis of this study: The new pro-therapeutic verbalizations emitted by the client

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after the Socratic method will increase in frequency in the following treatment sessions and will be reinforced by the therapist.

In order to further analyze the client's pro-therapeutic verbalizations, they were split into two groups: compliance and well-being verbalizations. This was done to examine our second hypothesis: the increase in the client's well-being verbalizations due to the debate will be related to an increase in the verbalizations that describe pro-therapeutic behaviors (compliance verbalizations) performed outside the clinical setting. These verbalizations will be verbally reinforced by the therapist.

Figure 1 shows a notable increase in both types of pro-therapeutic verbalizations starting from session five and reaching their peak at the last treatment session (session 10). Both types of verbalizations seem to evolve in a similar way, although compliance verbalizations change most notably once the treatment begins. This provides further evidence regarding the second hypothesis. The analysis shown in Table 3 also points towards the hypothesized fact that the therapist systematically reinforces the client's pro-therapeutic verbalizations.

Regarding the evolution of pro-therapeutic verbalizations throughout the therapy, a certain correspondence between the contents and therapeutic objectives of the debates and the increase in the pro-therapeutic verbalizations that refer to those concrete objectives is found. Most pro-therapeutic verbalizations are found in two specific objectives: objective 1 (jealousy and control) and objective 3 (relationship with her partner's family). Verbalizations regarding the general objective (well-being) are also very common. Among these three, they amount to 58.8% of all pro-therapeutic verbalizations. The objective in which the fewest number of pro-therapeutic verbalizations is found is objective 5 (unification and negotiation of certain aspects of their coexistence). These represent a 2.8% of the total. Sessions 7, 8, and 10 show the greatest number of pro-therapeutic verbalizations (56.7% of the total frequency throughout the therapy). Figure 2 shows the evolution of pro-therapeutic verbalizations throughout the therapeutic process sorted by the clinical objective they refer to.

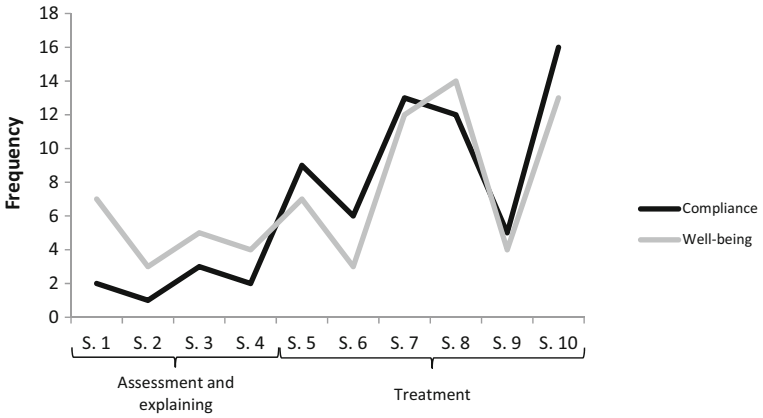

Fig. 1 Frequency of compliance and well-being verbalizations emitted by the client throughout the intervention

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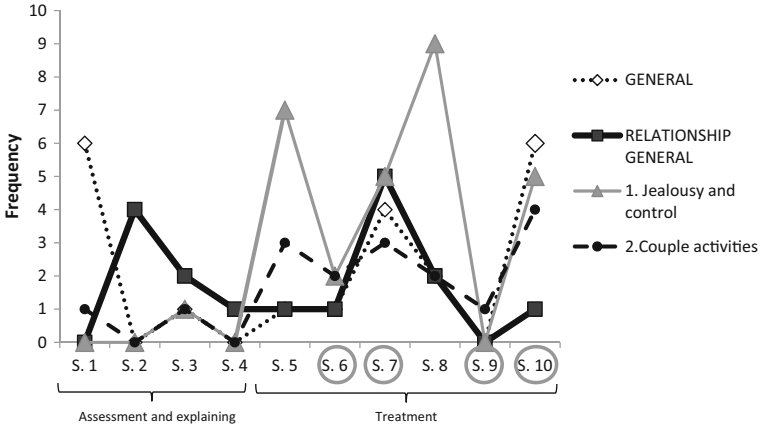

Fig. 2 Frequency of pro-therapeutic verbalizations emitted by the client throughout the intervention in relation with the principal therapeutic objectives. The sessions in which there were cognitive restructuring dialogs have been circled

Discussion

The results obtained in this study seem to tentatively support our research group's conceptualization of the Socratic dialog as a combination of verbal shaping and verbal chaining processes. The results of earlier studies pointed towards the plausibility of this approach (Calero-Elvira et al. 2013, 2011b; Froján-Parga and Calero-Elvira 2011, 2006, 2009, 2010), which now seems to be strengthened by the results of the present study. Even acknowledging the limited generalizability of the results in a single-case study with descriptive methodology, they might allow us to suggest some interesting conclusions.

Firstly, the fact that supporting evidence was found for our two hypotheses must be highlighted. As mentioned above, we believe that the dynamics of the Socratic method during cognitive restructuring allow for a description in terms of S-R-R+ sequences. Drawing from this standpoint and noticing that this case analysis seems to show a similar pattern to that found in our previously cited studies, we have obtained tentative support for (a) Pro-therapeutic verbalizations that are discussed within the Socratic dialog increase in frequency throughout the treatment, and (b) verbalizations that refer to the performance of pro-therapeutic behaviors outside clinical settings also increase their frequency.

In a dialog between the therapist and the client (and in any other kind of dialog), the therapist's questions discriminate the client's verbalizations that they precede and reinforce the ones they follow; this process closely resembles the typical scheme of verbal shaping and chaining. That is the reason why we can find S^d-R-R+ sequences, when the client answers in the desired manner; or S^d-R-S^d sequences, when the client's response can be further elaborated to increase its pro-therapeutic character, and thus the therapist emits another question.

Regarding our first hypothesis, we have noticed an increase in the number of pro-therapeutic verbalizations that the client emits after the Socratic dialog finishes and throughout the therapeutic process from that moment on. The evolution of these verbalizations throughout the therapeutic process seems to show an apparently ambiguous increase–decrease pattern. This is by no means surprising: Among other things,

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the client's speech might vary widely between two sessions depending on events occurring outside the clinical setting. These events, on the other hand, might drive the therapist to focus on a different therapeutic objective. Nonetheless, the frequency of pro-therapeutic verbalizations seems to follow a general ascending tendency.

However, the increase in the client's pro-therapeutic verbalizations cannot be solely ascribed to the implementation of the Socratic Method. There are certainly other processes involved; many of them might stem from the debates, but some others might not. For example, the simple fact of being on therapy with someone telling them that their problems can be solved might as well increase the frequency of the clients' well-being verbalizations. A professional therapist can intentionally evoke this kind of verbalizations to enhance the clients' momentary well-being and motivate them to follow the therapist's instructions. This could potentially explain why general pro-therapeutic verbalizations do not show a considerable increase throughout the treatment: The therapist might have increased this kind of verbalizations from the beginning of the therapy to create an appetitive motivational state (see Michael 1982, 1993, 2000) that promotes the therapeutic process (e.g., verbalizations regarding the client's commitment with the therapeutic process and its potential future benefits); on the other hand, therapists also frequently ask about pleasant or non-conflictive issues for the client during the first treatment stages, thus evoking this kind of verbalizations and establishing an appropriate emotional state for the intervention. In other words, not only the number of well-being verbalizations but also their content might change during therapy: Initially, these verbalizations would reflect well-being regarding either non-conflictive issues or the simple fact of being in therapy; later, they would reflect well-being regarding previously aversive or problematic issues, successfully addressed as specific goals of the intervention.

Focusing on the employment of the Socratic method in cognitive restructuring, its importance as a clinical procedure is not limited to the promotion of more rational thoughts (i.e., more rational verbalizations), but it extends to their generalization to different life situations. This, in turn, gives rise to more pro-therapeutic behaviors outside the clinical context. The first of our hypotheses deals with this first objective: to increase pro-therapeutic verbalizations and foster their generalization to different aspects of the client's life. In this regard, we observe that only 27 pro-therapeutic verbalizations appeared during the pre-treatment sessions, while 114 appeared during the treatment sessions. However, what we deem to be more interesting is the observed relation between this increase and the therapist's performance. As our results suggest, the therapist systematically reinforces the client's pro-therapeutic verbalizations. In our opinion, this systematic reinforcement may constitute a plausible explanation for their increase. Obviously, without an experimental analysis, we cannot assure that the change is causally linked to the systematic reinforcement of the therapist; we are thus limited to point out their co-occurrence. A pertinent question is whether the same effect could occur even if the therapist did not reinforce those verbalizations; the answer could be affirmative if non-programmed reinforcing processes with such an effect on the client's verbal behavior were naturally occurring in the client's daily life situations. However, a good therapist cannot risk letting things happen by chance. Of course, reinforcement dynamics must be established in non-clinical settings to maintain the therapeutic achievements once the therapy has concluded; however, for this to happen, the client must first overtly and covertly behave in accordance with the objectives of the

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debates. To that end, it is essential that the therapist supports (i.e., reinforces) the client's verbalizations that exemplify more functional thinking patterns. In this regard, we find the very same sequences we already found during the analysis of the debate: The client's responses are followed either by a reinforcement emitted by the therapist, by a new discriminative (thus making it obvious that the supposed shaping process does not end when the debate "officially" ends), or by *other kind of verbalizations* intended to generate a supportive motivational climate for the consolidation of the verbalizations.

In the introduction, we provided an explanation as to why the therapist's reinforcement of what the client says at a clinical setting could give rise to changes in the client's behavior in non-clinical settings. This explanation was based on the referential function of language. As we mentioned above, Mowrer's (1954) research on meaning transference processes supports the conception of the clinical setting as a natural setting, where some of the client's problem behaviors take place and can thus be directly modified by the therapist. This is one of the cornerstones of the so-called contextual therapies, grounded on the principles of the applied analysis of behavior and Skinnerian radical behaviorism: Acceptance and Commitment Therapy (ACT, Hayes et al. 1999a) and Functional-Analytic Psychotherapy (FAP, Kohlenberg and Tsai 1991). According to Mowrer, we could say that the clients' description of their daily life situations has a similar functional value (i.e., it evokes similar responses) to that of the daily life situations themselves. Therefore, Mowrer's meaning transference processes could explain how a person's response to certain environmental events can be indirectly modified through language without the need to train the desired response before the events themselves. The explanatory power of Mowrer's approach goes beyond its specific application to the Socratic dialog in cognitive restructuring: From our perspective, it would encompass all the therapeutic process. Regardless of the employed technique, most of the therapy occurs through a dialog between the therapist and the client. These continuous linguistic exchanges inside the clinic thus offer countless occasions for the learning and consolidation of new behaviors outside the clinic.

This is directly linked to our second hypothesis, regarding which supportive evidence has also been provided: The increase in the client's descriptions of his/her pro-therapeutic behaviors in non-clinical settings occurs simultaneously with the increase in the client's pro-therapeutic verbalizations. In order to test this hypothesis, we had to separately analyze the verbalizations that described the client's well-being and the verbalizations that described compliance with the tasks proposed by the therapist. Figure 1 shows the parallel evolution of both kinds of pro-therapeutic verbalizations throughout the therapy. From session 5 on (which was the first treatment session), the compliance verbalizations clearly outnumber well-being verbalizations in practically all sessions. In short, it is not enough for the clients to verbalize how well they feel, but they must behave in a non-problematic way in their daily life. However, since the therapist cannot be there to directly reinforce pro-therapeutic behaviors, he/she must evoke and reinforce the description of those behaviors in order to promote the desired changes.

There is a noteworthy result in session 9 (see Fig. 1), where there is a pronounced decrease of both well-being and compliance verbalizations. During this session, the therapist tackled some aspects of objective 5 (negotiation and unification of certain coexistence issues) which, since they implied changes in her partner's behavior, had not

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yet been fully achieved. Since conflictive issues were raised so that the therapist could shape new verbalizations in relation to those issues, the overall number of pro-therapeutic verbalizations decreased. One month later, in session 10, well-being and compliance verbalizations not only reached but also surpassed in some cases their previous levels.

Figure 2 shows the evolution of pro-therapeutic verbalizations sorted by the clinical objective they refer to. Nonetheless, some of the information it provides requires further clarification: Throughout treatment, the second highest number of pro-therapeutic verbalizations regarding both "jealousy and control" and "couple activities" is seen in the first treatment session. Given that neither cognitive restructuring nor any other intervention technique had yet been implemented, this fact is striking. However, the explanation of this result is also coherent with our approach to clinical change: In fact, clients might adopt positive behavioral strategies regarding certain problematic issues even before the therapist has addressed those issues or instructed them to behave in a certain way. For example, after the therapist has explained the functional analysis and clarified what the source of the psychological problem and its possible solutions might be, some clients are likely to autonomously engage in untrained behavioral changes that might prove beneficial, at least in the short-term. These changes are then communicated in the following session (here session 5). In our case, the following verbalizations exemplify this process: "I just didn't wanted to, I didn't feel like" (checking the phone); "This week, that problem we had (not spending enough time together, arguing all the time) has been overcome." This could thus explain why pro-therapeutic verbalizations appear even when no clinical technique has yet been implemented. This unscheduled changes might be expected, but again, a good therapist cannot risk reducing the treatment to merely expect their occurrence. Some people do not know how to act even if they know what needs to be done; clinical techniques ensure and consolidate psychological change in the desired direction. In this regard, the Socratic debate is an optimal procedure to increase the number of verbalizations that promote the client's pro-therapeutic behaviors in daily life settings.

Despite the already discussed limitations of this study, its results nonetheless seem to match those obtained in our previous research. This, in our opinion, suggests the possibility of explaining both the Socratic method in cognitive restructuring and the therapeutic process in general in terms of verbal shaping and verbal chaining processes (Calero-Elvira et al. 2013; Calero-Elvira et al. 2011b; Froján-Parga and Calero-Elvira 2011; Froján-Parga et al. 2006, 2009, 2010). From our perspective, operant reinforcement and punishment, together with the Pavlovian processes that explain behavior modification through language, offer a sound basis for the Socratic dialog in cognitive restructuring.

As aforementioned, this approach also allows for the conceptualization of thought as covert behavior (i.e., controlled by the same learning processes as manifest behavior) and for the study of cognitive change as a behavioral change. This means overcoming the Cartesian dualism to which Beck's (Beck 1967; Beck et al. 1979) and Ellis' (1962) original approaches inevitably drove us with their sort of bio-medical model of psychological problems. Their version of the bio-medical model differs from the original in that the internal phenomena that these and other authors posit as the causes of behavior are not organic, but mental or intrapsychical (e.g., mental schemata). The philosophical implications of this assumption are at the very least problematic. If the

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etiology is neither environmental nor inner structural/organic, we are left with a "second substance" that somehow has causal powers on behavior: some sort of non-materialistic "mind," completely separated from the body, and its physical relation with the environment.

A single-case study like this one can only hope to be a starting point for further research on the study of language in clinical settings from a radical behaviorist standpoint. However, our research line has already allowed in recent years for significant advancements in the comprehension of the learning processes underlying the clinical practice. In our opinion, both its philosophical and experimental foundations constitute a promising alternative to the traditional cognitive conceptualizations. The overcoming of Cartesian dualism—with its derived tautological explanations—and the possibility of submitting therapeutic procedures to experimental analysis are both desirable targets for the development of scientific psychology. Looking ahead to the future, the observational methodology detailed above presents us with a rich variety of new potential research areas to be explored; for example, we are now developing a new research line for the improvement of the psychological treatments offered to people diagnosed with schizophrenia. The project is based on a functional analytic approach to this psychological problem (Rosenfarb 2013). Among its potential contributions, the reduction of pharmaceutical expenses, the improvement of psychological care, and the enhancement of this population's quality of life and possibilities of recovery should be highlighted.

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