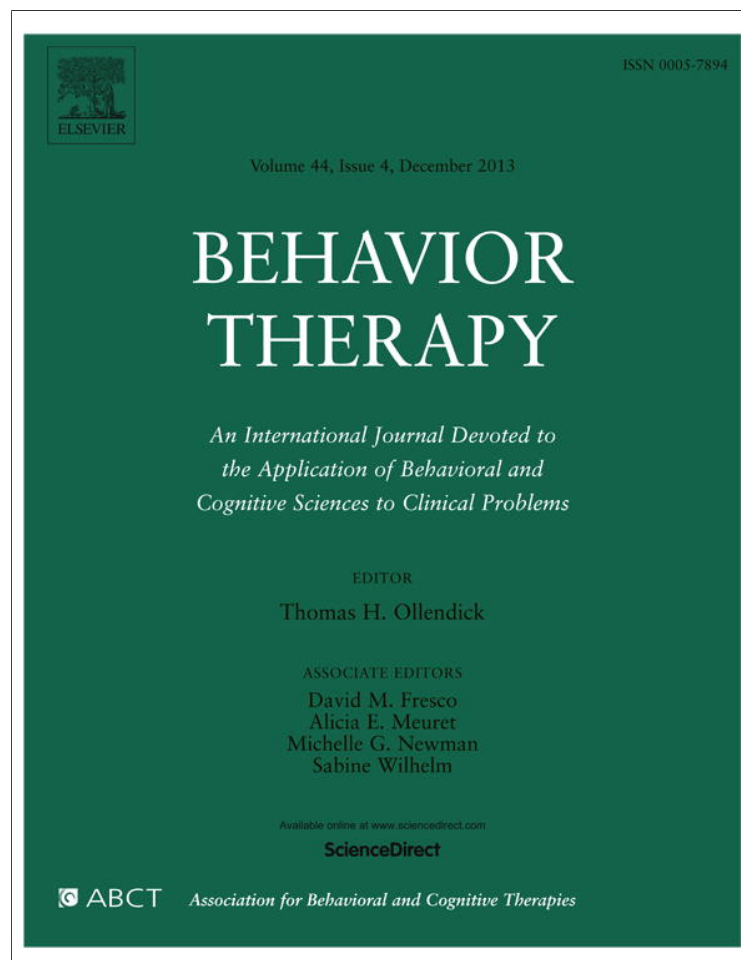


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Descriptive Study of the Socratic Method: Evidence for Verbal Shaping

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In this study we analyzed 65 fragments of session recordings in which a cognitive behavioral therapist employed the Socratic method with her patients. Specialized coding instruments were used to categorize the verbal behavior of the psychologist and the patients. First the fragments were classified as more or less successful depending on the overall degree of concordance between the patient's verbal behavior and the therapeutic objectives. Then the fragments were submitted to sequential analysis so as to discover regularities linking the patient's verbal behavior and the therapist's responses to it. Important differences between the more and the less successful fragments involved the therapist's approval or disapproval of verbalizations that approximated therapeutic goals. These approvals and disapprovals were associated with increases and decreases, respectively, in the patient's behavior. These results are consistent with the existence, in this particular case, of a process of shaping through which the therapist modifies the patient's verbal

behavior in the overall direction of his or her chosen therapeutic objectives.

Keywords: behavior therapy; Socratic method; mechanisms of change; cognitive restructuring; shaping

COGNITIVE TECHNIQUES HAVE BEEN classified in multiple ways within the cognitive-behavioral approach. One of the most widespread classifications is that by Mahoney and Arnkoff (1978), who distinguish three approaches: cognitive restructuring, coping skill training, and problem solving. Cognitive restructuring techniques are exemplified in influential approaches such as Ellis's (1962) rational emotive therapy and Beck's cognitive therapy (Beck, 1967; Beck, Rush, Shaw, & Emery, 1979). These therapeutic approaches in turn include a variety of techniques, of which the Socratic method (or Socratic questioning) is the main element. The importance of the Socratic method is such that, according to Padesky (1993; as cited in Kennerley, 2007), it is the cornerstone not only of cognitive restructuring but of cognitive therapy in general.

Aside from differences between Beck's and Ellis's proposals, the Socratic method is essentially defined as a dialogue between therapist and patient in which the former tries to make the patient reflect on the appropriateness of his/her cognitions and then change his/her dysfunctional thoughts, mainly through questioning and disputational strategies. After close to four decades since the introduction of cognitive restructuring techniques, numerous studies have pointed to the efficiency/effectiveness of Beck's cognitive therapy and Ellis's rational emotive

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(behavioral) therapy (e.g., Brestan & Eyberg, 1998; Chambless et al., 1996, 1998; González et al., 2004; Gould, Mueser, Bolton, Mays, & Goff, 2001; Nathan & Gorman, 2007; Strunk & DeRubeis, 2001; Task Force on Promotion and Dissemination of Psychological Procedures, 1995; Terjesen, DiGiuseppe, & Gruner, 2000).

Authors such as Carey and Mullan (2004, 2007), however, have documented some lack of clarity in this therapeutic procedure, starting with the diversity of names that have been used to describe it, from *guided discovery* (Beck, Wright, Newman, & Liese, 1993) to *Socratic reasoning* or *Socratic manner* (Linehan, 1993). Additionally, process research has not clarified the mechanisms of change that explain the effects of cognitive restructuring or of the Socratic method (Burns & Spangler, 2001). Two different types of process studies have been conducted. In the first type of study, researchers have attempted to identify which behavioral (Dimidjian et al., 2006; Dobson et al., 2008; Jacobson et al., 1996) and cognitive (Arnkoff, 1986; Bennett-Levy, 2003; Jarrett & Nelson, 1987; Zettle & Hayes, 1987) components are most active during belief restructuring therapy. No clear consensus has been reached yet about the nature of active components. In the second type of study, researchers have attempted to identify variables such as attribution style (Whisman, 1993) or cognitive change (Garratt, Ingram, Rand, & Sawalani, 2007; Longmore & Worrell, 2007; Muran et al., 1995; Szentagotai, David, Lupu, & Cosman, 2008) as mediators of cognitive restructuring effects, again without reaching clear conclusions.

Given the current lack of clarity, it seems important to adjust the methodology to address these unanswered questions (Busch et al., 2009; Kazdin, 2007). One way to do so is to conduct a fine-grained analysis of patient-therapist interactions that lead to therapeutic changes in patient behavior as a result of the Socratic method. Up until now, this has not been explored in the scientific literature, and would be of great interest to psychotherapy research, because a better understanding of the behavioral mechanisms that underlie the Socratic method should lead to more effective and efficient treatment strategies. Despite the fact that there exists a great deal of research employing a level of analysis like the process studies which have been previously mentioned, they have not provided clear results. With this in mind, it remains clear that an alternate methodology is necessary, such as that proposed in this manuscript.

Following Hamilton (1988), Poppen (1989), Rosenfarb (1992), and Follette, Naugle, and Callaghan (1996), we propose that clinical change involves the shaping of new behaviors. This shaping

process is assumed to occur through the verbal exchange between the psychologist and the patient and, in particular, through the differential reinforcement of approximations to adaptive behaviors and the punishment or extinction of counterproductive behaviors. From this perspective, the Socratic method may be seen as a verbal procedure of reinforcement in which the therapist seeks to change the rules held by the patient, providing the patient with new rules so as to engage in a finer analysis of contingencies (Poppen) that enables a new therapeutic behavior. During the interaction with the therapist the patient may respond by defending his or her beliefs. The resulting challenges raised by the therapist may function as punishment, despite simultaneously modeling and reinforcing the assertion of new rules.

The process of verbal reinforcement has been examined experimentally and demonstrated to have an impact within other techniques, such as systematic desensitization and exposure (Barlow, Agras, Leitenberg, & Wincze, 1970; Hamilton & Schroeder, 1973; Ullman, Krasner, & Collins, 1961). Additionally, these processes have been analyzed and shown to be operating within other therapeutic approaches such as Rogerian therapy (Truax, 1966). Thus, there are reasons to believe that such a process would also occur within naturalistic cognitive therapy. However, to date verbal shaping has not been empirically analyzed during the performance of the Socratic method; this study provides a unique contribution to the field by extending these prior analyses to this technique.

In previous studies, we developed and fine-tuned a system of categories that described the therapist's and the patient's verbal behavior during the course of Socratic disputations (Calero-Elvira, Froján-Parga, Ruiz-Sancho, & Vargas-de la Cruz, 2011; Froján-Parga, Calero-Elvira & Montañó-Fidalgo, 2006, 2009, 2011). Whereas our previous studies dealt with the nature of the therapist's verbal repertoire, here we applied our observational system to components of the interaction between patient and therapist. The main question we tried to answer was whether implementing the Socratic method produced changes in the patient's verbalizations via a process of shaping (Catania, 1992) in which approval and disapproval by the therapist functioned as reinforcement and punishment, respectively. We in turn tested two hypotheses: (a) during the course of the Socratic method, the therapist would deliver differential consequences depending on how closely the patient's verbalizations approximated therapeutic goals, and (b) implementing this shaping process more consistently would lead to a closer overall correspondence between the patient's verbal statements and the therapeutic goals.

Table 1
Characteristics of the Fragments of the Socratic Method and of the patient

Fragment characteristics		patient characteristics		
Case	Number of fragments (total duration)	Gender	Age	Problem
1	13 (1h 31' 30")	F	29	Depression
2	3 (1h 17' 09")	F	30	Marital problems
3	11 (0h 32' 30")	F	32	Marital problems
4	27 (2h 19' 22")	F	34	Depression
5	9 (0h 30' 11")	F	30	Marital problems
6	1 (0h 01' 23")	M	33	Depression
7	1 (0h 02' 00")	F	29	Marital problems

Note. F = female; M = male.

Using our data base of videotaped clinical sessions (Froján-Parga, Montaña-Fidalgo, & Calero-Elvira, 2010; Froján-Parga et al., 2011), we addressed these questions via a two-step strategy. First, we classified therapeutic episodes as totally successful, partially successful, or unsuccessful depending on the overall degree of concordance between the patient's verbal behavior and the therapist's objectives. Then all episodes were submitted to more detailed sequential analyses to discover regularities linking the patient's verbal behavior to the therapist's subsequent approval or disapproval. If our shaping hypothesis was correct, then the episodes classified as totally and partially successful at a global level should show stronger local dependencies between the patient's verbal behavior and the therapist's approval or disapproval of it.

The results obtained through this type of study would be of interest for multiple reasons. First, this study provides an empirical test of the behavioral processes that are assumed to underlie the Socratic method (i.e., shaping of patient verbalizations via differential reinforcement and punishment by the therapist) and thus extends prior conceptual speculation about the mechanisms of action for an important therapeutic technique. This study also provides a methodology to examine the behavioral mechanisms that are involved in real-time therapy interactions and that contribute to important changes in patient behavior. Finally, the results could have implications for training aspiring therapists and for improving efficacy and efficiency of cognitive behavior therapy.

Material and Methods

SAMPLE

The sessions we analyzed came from a data base of video recordings that involved a single cognitive-behavioral therapist with 16 years of professional experience at the Instituto Terapéutico de Madrid (ITEMA, Spain). Clinical sessions were included in the data base conditionally on each patient's informed

consent and not on the basis of the type of clinical technique and/or therapeutic success. In all cases different intervention techniques were applied according to the individualized functional analysis of their behavioral problems. In this study, we identified 65 fragments of clinical sessions during which the Socratic method was employed. They involved seven patients (all of them upper-middle-class Caucasian adults from Spain; age range = 29–34 years) who underwent therapy between 2004 and 2006 for depression or marital problems. The number of identified fragments ranged from 1 to 27 across patients. Table 1 shows a resume of the sample used in this study.

INSTRUMENTS

All session fragments were time-stamped and processed through *The Observer XT*© software (version 6.0, Noldus Information Technology). The codification of the therapist's verbal behavior followed the *therapist system of categories* developed in our previous work (Calero-Elvira, 2009; Calero-Elvira et al., 2011; Froján-Parga et al., 2008; Virués-Ortega, Montaña-Fidalgo, Froján-Parga, & Calero-Elvira, 2011). The *patient system of categories* (Calero-Elvira, 2009; Calero-Elvira et al., 2011) was used to classify each one of the patients' utterances according to their degree of approximation to the therapeutic objectives. Finally, the *verbal effectiveness scale* (Calero-Elvira, 2009) was used to classify each fragment of Socratic method as completely successful, partially successful, or unsuccessful. Details on the employed categories are provided below. In all cases, data from *The Observer XT* were formatted through the *ObsTxtSds* 2.0 software, which transforms data into the Sequential Data Interchange Standard (Bakeman & Quera, 1995). Between-observer agreement was computed in *SPSS* 15.0 and in *The Observer XT* 7.0. Tests of significance for sequential analysis were performed with the *Generalized Sequential Querier* 4.5 (Bakeman & Quera). Both the therapist's and the patient's verbal behavior were codified in a moment-by-moment basis and then *The Observer XT* was used, but the verbal effectiveness was scored as a global measurement at the end of each fragment and then a written record was used.

PROCEDURE

An expert in behavior therapy (Observer 1) with a Ph.D. in clinical psychology and 4 years of clinical expertise analyzed all the sessions in our data base to identify the moments in which the Socratic method was applied. The relevant fragments of the Socratic method were identified through previously developed guidelines (Calero-Elvira, 2009) that define a Socratic disputation and when a disputation starts

and ends. These guidelines emphasize clinical criteria extracted from the most common manuals of cognitive therapy (Beck et al., 1979; Dryden, DiGiuseppe, & Neenan, 2003; Ellis & Grieger, 1977; Padesky & Greenberg, 1995), starting from the definition of Socratic disputation: a dialogue between therapist and patient in which the former makes patients reflect on the appropriateness of their cognitions and then modifies their dysfunctional thoughts, mainly through questioning and disputational strategies. We only took into account the dialogues in which the therapist had previously assessed that the patient's cognitions were not in agreement with the empirical evidence. All Socratic fragments we identified were included for data analysis, regardless of the quality of execution of the disputation technique.

Once a fragment was identified, Observer 1 (previously trained for more than 100 hours in the use of software and measuring instruments) examined the time-stamped videos and coded each therapist's verbalization in accordance with the therapist system of categories. Although the original system comprised a variety of categories (Froján-Parga et al., 2008; Virués-Ortega et al., 2011), in the present study we focused on only three of them: *cueing* (typically some question by the therapist), *approval* by the therapist, and *disapproval* by the therapist. Definitions and examples for these three categories appear in Table 2.

Each fragment was then analyzed a second time to identify the therapeutic objective that the psychologist

pursued at any moment of the Socratic dialogue. This objective was easily inferred from the content of the therapist's verbal cueing. For example, the objective, "acknowledging one's competence at work," could be inferred from the therapist's cueing: "You told me that after you met with foreign customers, your boss seemed pleased with your work. So don't you believe that you work well with customers?" Once the current therapeutic objective was identified, each patient's utterance was coded according to the patient system of categories. The patient's utterances were classified as *approximating* the therapeutic objective (VAT), *opposing* this objective (VOT), *intermediate* with respect to the objective (VIT), or irrelevant to the objective ("other" category). Definitions and examples for these categories appear in Table 3. Therapist's and patient's verbal behavior were observed continuously along the entire length of the Socratic method, and codes were assigned as soon as they could be identified by the observer. The observer rated the occurrence/nonoccurrence for each category. A single code or different consecutive codes could be assigned

Table 2
Therapist System of Categories

Categories	Definitions and examples
Cue	Verbalization by the therapist, typically a question, that evokes a patient's response (verbal or otherwise). Explicit instructions, prompting, and motivational operations are excluded. E.g., Therapist: "Do you think that there could be a different way of understanding this situation?" Patient: "Yes."
Approval	Verbalization by the therapist showing approval, agreement, and/or acceptance of patient's behavior. E.g., Patient: "I had never been able to do that without taking a pill, so I'm proud of myself." Therapist: "Good."
Disapproval	Verbalization by the therapist showing disapproval, rejection, and/or non-acceptance of the behavior of the patient. E.g., Patient: "I don't think I can." Therapist: "I think that's not true judging by what you have told me."
Other	Any verbalization that cannot be included in any of the preceding categories (e.g., chitchat).

Table 3
Patient System of Categories

Categories	Definitions and examples
VAT	Any verbalization that approximates the therapeutic objective of the Socratic method. E.g., Therapist: "Do you think that you are generally good at your job?" Patient: "Yes, in general I do many things right, such as my data analyses, reports and customer contact, and I only rarely do them wrong. The only thing at which I'm not good is speaking in front of an audience, but I seldom have to do that."
VOT	Any verbalization that opposes the therapeutic objective of the Socratic Method. E.g., Therapist: "Do you think that you're generally good at your job?" Patient: "Not at all."
VIT	Any verbalization intermediate with respect to the therapeutic objective of the Socratic method. E.g., Therapist: "Do you think that you're generally good at your job?" Patient: "A little bit of both, I think. Speaking in front of an audience is something at which I'm quite bad, and there are other things at which I'm good."
Other	Any verbalization that cannot be included in any of the preceding categories. E.g., Therapist: "Do you think you do things well?" Patient: "And what do you think?"

Note. These examples come from a case in which the therapist has previously made sure that the patient is, most of the time, good at his job, and has had it corroborated by his boss via report. This patient starts with utterances that go along the lines of "I'm not good at my job," "I don't do anything right in my job." It's worth mentioning that the Socratic method here exemplified resembles more closely Ellis's more persuasive style than the didactic approach of Beck.

within a single turn from the therapist or the patient—no segments were defined a priori in the videos.

Finally, each Socratic fragment was coded in terms of its overall verbal effectiveness. Each fragment was classified as a *failure* (discordance between the patient's verbal behavior and the therapist's objectives), a *partial success* (mitigated concordance between the patient's verbal behavior and the therapist's objectives), or a *total success* (full concordance between the patient's verbal behavior and the therapist's objectives). Definitions for these three levels of verbal effectiveness appear in Table 4.

Notice that whereas the therapist (Table 2) and the patient (Table 3) systems of categories address behavioral occurrences moment to moment, the verbal effectiveness of a Socratic fragment (Table 4) is a global measure of the patient's verbal behavior in this fragment, a measure that involves an entirely different level of analysis indicative of the overall quality with which his or her verbal behavior adjusts to the therapeutic objectives. Note that this classification evaluates the patient's behavior change across time in each Socratic fragment and it is not a rating made at one specific point in time; for this evaluation the progression of the patient's verbalizations are taken into account (when the verbalizations more or less approximate to the therapeutic objectives) and the degree to which they adjust to the therapeutic objectives being discussed. It is important to note that effectiveness in this case refers to each application of the Socratic method,

and never refers to other global clinical changes made at the end of the sessions, between sessions, or at the end of treatment. Complete observational guides for all categories, including the coding criteria, are available upon request.

RELIABILITY

Concordance levels were computed periodically. The Socratic fragments used for this evaluation were chosen randomly from the total sample, with the restriction that their duration was to be equal to or greater than 5 minutes. After Observer 1 coded approximately 10 fragments, her scoring was compared with that of other observers who coded the fragments independently (Observer 2 in the case of the therapist system; Observer 3 in the case of the patient system and the verbal effectiveness scale). These other observers were Ph.D. students in clinical psychology who had been trained for more than 100 hours in the use of the instruments but were not familiar with the hypotheses of the study. In total, approximately 10% of the sample was rated twice for interrater agreement calculations.

In the case of the therapist and patient coding systems, the minimum level for analysis was set at kappa = .50, which corresponds to the middle range of reasonable values for this index (Bakeman, 2000; Landis & Koch, 1977). In the case of the verbal effectiveness scale, the minimum level for analysis was an intraclass correlation coefficient of 0.80, the lowest value considered optimal (Quera, 1997). In the case of therapist and patient systems, point-by-point values for percentage of agreement and Cohen's kappa were calculated with a tolerance window of 2 seconds. Kappa values always exceeded the minimum except in one inter-judge comparison, which was reexamined to identify the causes of disagreement.¹ Global agreement with respect to the verbal assessment scale was computed via Berk's intraclass correlation coefficient, assuming a parallel model and absolute agreement.

As in previous studies (Calero-Elvira et al., 2011; Froján-Parga et al., 2008; Virués-Ortega et al., 2011), we obtained adequate levels of concordance for the therapist system (percentage of agreement among observers from 71% to 82%, Cohen's kappa from .65 to .76, $p < .01$), the patient system

Table 4
Levels of Verbal Effectiveness of a Socratic Fragment

Level	Definition
Failure	Either (a) none of the patient's verbalizations approximates the therapeutic objectives, or (b) a patient's verbalization approximates the therapeutic objective once in a nonemphatic way (e.g., "yes, perhaps") and is later contradicted by another of the patient's verbalizations (e.g., "no, I do not think so").
Partial success	The patient expresses a verbalization that approximates one of the main objectives of the Socratic method, but does it (a) once in a nonemphatic way without later contradiction, or (b) more than once in a nonemphatic way that is later contradicted, or (c) once in an emphatic way that is later contradicted by another of the patient's verbalizations.
Total success	The patient expresses a verbalization that approaches one of the main objectives of the Socratic method (a) at least once in an emphatic way (e.g., "yes, definitely") and without later contradiction, or (b) more than once in a nonemphatic way and without later contradiction.

¹ In these cases, the accuracy of the main observer's application of the coding criteria must be tested, ensuring that it shows no distortion due to fatigue or an excess of observation without an inter-observer comparison. This is essential, for the only data that will be used for the study's analyses will be coded by her, and not the secondary observers. In this case, it was made clear that the Observer 1 was correctly applying the coding criteria and her disagreements with Observer 3 were due to technical errors in coding.

(percentage of agreement among observers from 60% to 86%, Cohen's kappa from .48 to .79, $p < .01$), and the verbal success scale (Berk's intraclass correlation coefficient = .95, $p < .01$).

DATA ANALYSIS

The Socratic segments were submitted to a log-linear sequential analysis (Bakeman, Adamson, & Strisik, 1995; Bakeman & Gottman, 1986, 1997; Quera, 1993) to detect possible relations between the patient's and the therapist's verbal responding within each category of segment effectiveness (total success, partial success, and failure). Before examining specific transition probabilities between therapist cueing, patient's VAT/VOT/VIT, and therapist's approval/disapproval, we assessed global associations from the patient's behavior to the therapist's behavior and vice versa via the chi-square statistic. Then we examined lag-1 transitions between patient's VATs and therapist's approval/disapproval, between patient's VOTs and therapist's approval/disapproval, and between patient's VITs and therapist's approval/disapproval. To explore relations within specific pairs of categories, we computed the adjusted residuals (z), a standard procedure to determine whether the second member of a pair occurs after the first member more or less often than expected by chance. We also computed Yule's Q statistic as a measure of effect size (Bakeman & Quera, 1995).

Results

BEHAVIORAL SEQUENCE ANALYSIS

In terms of verbal effectiveness, 39 Socratic fragments were classified as total success, 21 as partial success, and 5 as failures. Within each category of verbal effectiveness, global tests of association revealed significant lag-1 relations between the therapist's and patient's behavior (chi-square values

ranging from 70.28 to 1379.61, degrees of freedom ranging from 24 to 28, all p -values $< .01$). Thus, it seems that the patient's behavior affected the therapist's behavior immediately afterward.

Given this overall significant pattern, associations between specific categories were analyzed in more detail to determine if the therapist's responses to the patient's verbalizations differed between the three types of Socratic fragments. The behavioral sequences of the three groups were analyzed separately in order to test the first (the therapist-delivered differential consequences depending on how closely the patient's verbalizations approximated therapeutic goals) and second hypotheses (implementing this shaping process more consistently led to a closer overall correspondence between the patient's verbal statements and the therapeutic goals) simultaneously. Due to a small sample size, some of the adjusted residuals did not meet the requirements of the normal approximation, primarily in the fragments labeled as failure and, to a lesser extent, in those labeled as partial success. Thus, some of the results should be taken with caution.

Table 5 summarizes the results, in terms of z values and Yule's Q , of the tests performed at lag 1 between the patient's VAT/VOT/VIT and the therapist's subsequent approval/disapproval. When statistically significant, positive values of z and Q indicate a positive relation between the first member of a pair and the second one; the second member of the pair occurs after the first member more often than expected by chance. When statistically significant, negative values of z and Q indicate a *negative* relation between the first member of a pair and the second one; the second member of the pair occurs after the first member *less* often than expected by chance. The associations among categories that were positive and statistically significant in at least one type of Socratic

Table 5
Lag-1 Relations Between Patient's VAT/VOT/VIT and Therapist's Approval/Disapproval

Event pair (lag)	Total success	Partial success	Failure
VAT/App (+1)	$z = 19.57, p < .01^{**}$ $Q = .83$	$z = 5.86, p < .01^{**}$ $Q = .66$	$z = 2.80, p < .01^{**}$ $Q = .91$
VAT/Dis (+1)	$z = -4.05, p < .01^{**}$ $Q = -.82$	$z = -2.23, p < .05^*$ $Q = -1.00$	$z = -0.19, p = .85$ $Q = -1.00$
VOT/App (+1)	$z = -0.49, p = .62$ $Q = -.051$	$z = 1.96, p = .051$ $Q = .28$	$z = 0.46, p = .65$ $Q = .20$
VOT/Dis (+1)	$z = 15.98, p < .01^{**}$ $Q = .89$	$z = 9.33, p < .01^{**}$ $Q = .91$	$z = 2.44, p < .05^*$ $Q = 1.00$
VIT/App (+1)	$z = 3.52, p < .01^{**}$ $Q = .44$	$z = 5.38, p < .01^{**}$ $Q = .80$	$z = -0.49, p = .62$ $Q = -1.00$
VIT/Dis (+1)	$z = 5.56, p < .01^{**}$ $Q = .68$	$z = 0.13, p = .89$ $Q = .07$	$z = -0.28, p = .78$ $Q = -1.00$

Note. App = approval; Dis = disapproval; * $p < .05$ ** $p < .01$.

fragment (Table 5) are also represented graphically in Figure 1, as uncrossed links when reaching statistical significance (alpha level = .05) and as crossed links when not reaching statistical significance. For summarizing purposes, Figure 1 omits negative relations.

Regardless of the type of Socratic fragment, the therapist tended to approve when the patient's behavior approximated the current therapeutic objective (VAT). Conversely, VATs were followed by the therapist's disapproval with a frequency lower than expected by chance in the totally and partially successful fragments; this negative relation did not reach statistical significance in the fragments classified as failure (Table 4). In all types of fragments, the therapist tended to disapprove when the patient's verbalization opposed the therapeutic objective (VOT). Although failing to reach statistical significance, the association between VOTs and the therapist's approval was negative in the fragments classified as total success, and positive otherwise. With the previous analyses, no notable differences between the three types of Socratic fragments were seen. However, the most notable difference between the three types of Socratic fragments concerned the therapist's behavior following verbalizations that were intermediate with respect to the therapeutic objective (VITs). In totally successful fragments, VITs were associated positively and significantly with both approval and disapproval; the association between VITs and the therapist's disapproval approached zero in partially successful fragments; no association between VITs and approval/disapproval reached statistical significance in the fragments classified as failure (Table 5 and Figure 1).

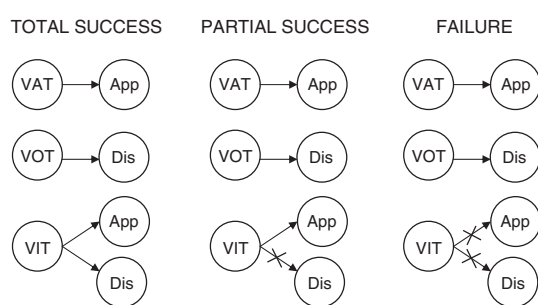


FIGURE 1 Transition diagrams of the lag-1 sequential relations between the patient's verbal behavior and the therapist's response to it for each type of Socratic fragment. The arrows represent the relations between categories that were positive and statistically significant in at least one type of Socratic fragment. Crossed links indicate nonsignificant relations at alpha = .05. For summarizing purposes, negative relations are not represented. (VAT: verbal behavior approximating the therapeutic objective; VOT: verbal behavior opposing the therapeutic objective; VIT: verbal behavior in the intermediate category; App: approval; Dis: disapproval).

ANALYSIS OF THE PROGRESSION OF THE RATE OF PATIENT BEHAVIOR

In order to demonstrate the existence of a shaping process, it is necessary to show that (a) the therapist reinforces appropriate verbalized cognitions and punishes or ignores inappropriate verbalized cognitions, and (b) that the selective punishment and reinforcement results are linked to appropriate increases and decreases in the patient's behavior. The analyses found in the previous section are directed at demonstrating the first requirement of the shaping process and the analyses of the current section are aimed at demonstrating the second. Without addressing both of these aspects of the shaping process, it would not be possible to confirm the general hypothesis of shaping.

The basic property of reinforcement is that its use with a specific class of behavior leads to a subsequent increase in the probability of the occurrence of this class of behavior. On the contrary, a punishment would lead to a consequent decrease in the probability of occurrence of this specific class of behavior. Therefore, it can be expected that the rate of VATs would increase over time in the Socratic fragments and that the rate of VOTs would decrease over time. Furthermore, in line with our hypothesis, this progression should be more apparent in the totally successful fragments than in the partially successful fragments and even more so in comparison with the fragments classified as failures. This response pattern would be related to the differential responses to VITs that was seen in the three types of Socratic fragments.

In order to analyze this progression, all of the Socratic fragments were divided into three sections, each of equal duration: beginning, middle, and end of the fragment. This was achieved by dividing each fragment's total length in three sections of the same duration and labeling them as beginning, middle, or end of the fragment. Then, the rate per second of the patient's behavior categorized as VAT, VOT or VIT was calculated for the beginning, middle, and end of each fragment, so that inter-fragment comparisons were possible when divided by the common time unit. Additionally, different tests were used to test for significance of differences between beginning, middle, and end rates in the three types of Socratic fragments. In the case of the totally successful fragments, a paired samples *t* test was used. Due to the small sample size, the partially successful fragments and the failure fragments were analyzed using the Wilcoxon test. These results are summarized in Tables 6, 7, and 8 and graphically represented in Figures 2, 3 and 4.

In regard to the totally successful fragments, an increase in the rate of VATs can be seen as the

Table 6
Rates Per Minute of VAT, VOT and VIT in the Beginning, Middle, and End of the Totally Successful Fragments

Rate	Moment	<i>M</i>	<i>SD</i>	Comparison	<i>t</i> (38)	<i>p</i>
VAT	Beginning	0.047	0.071	Beginning-Middle	-1.439	.16
	Middle	0.073	0.127	Beginning-End	-3.065	.00*
	End	0.103	0.104	Middle-End	-1.603	.12
VOT	Beginning	0.027	0.032	Beginning-Middle	0.189	.85
	Middle	0.025	0.052	Beginning-End	3.506	.00*
	End	0.008	0.014	Middle-End	1.942	.06
VIT	Beginning	0.009	0.022	Beginning-Middle	1.671	.10
	Middle	0.004	0.008	Beginning-End	1.969	.05*
	End	0.002	0.005	Middle-End	1.455	.15

Note. **p* < .05.

fragment progresses, whereas the rate of VOTs and VITs decreases. The differences in these rates of VATs, VOTs and VITs are gradual and only significant between the beginning and end of the fragments, not between the beginning and the middle, or between the middle and the end. In terms of the partially successful fragments, the progression is not as linear as in the case of the totally successful fragments. It can be observed that the rate of VATs decreases between the beginning and the middle of the fragments, while after the middle of the fragments the rates notably increase, although it is not a statistically significant difference. In the case of VOTs, there is a statistically significant decrease between the rate at the beginning and the middle of the fragments, whereas further on in the fragment a slight increase can be seen. In terms of VITs, there is initially an increase and later on a decrease, with neither change being statistically significant. Regarding the fragments classified as failures, none of the differences seen were statistically significant. There was an initial increase in VATs and further on a decrease in this type of verbalization, with the same pattern occurring in the case of VOTs. With respect to the VITs, a decline in this type of comment can be seen

as the fragment progresses. Figure 5 combines the most important data from Tables 6–8 for an easy visual comparison through different success levels and moments in the Socratic method.

Discussion

The present study has a number of limitations that should be discussed before examining the implications of our results for theories of clinical change. Some of these limitations arise from the restricted nature of the data base at our disposal. The Socratic fragments we analyzed involved only one therapist and seven clinical cases. Furthermore, even though this therapist was highly experienced in cognitive-behavior therapy, she did not implement a manualized form of the Socratic method. Variations among different therapists' implementations of the Socratic dialogue may impede the extension of our findings to other settings and therapists. However, our current goal was to conduct a first study with clinical sessions performed by a single therapist with a high degree of experience based on the guidelines of the APA Presidential Task Force on Evidence-Based Practice (2006). These guidelines highlight the need to identify technical skills utilized by expert clinicians in the administration of

Table 7
Rates Per Minute of VAT, VOT and VIT in the Beginning, Middle, and End of the Partially Successful Fragments

Rate	Moment	<i>M</i>	<i>SD</i>	Comparison	<i>z</i>	<i>p</i>
VAT	Beginning	0.026	0.032	Beginning-Middle	-0.621	.54
	Middle	0.020	0.034	Beginning-End	-1.232	.22
	End	0.114	0.236	Middle-End	-1.764	.08
VOT	Beginning	0.043	0.051	Beginning-Middle	-1.931	.05*
	Middle	0.025	0.034	Beginning-End	-1.533	.13
	End	0.027	0.041	Middle-End	-0.035	.97
VIT	Beginning	0.002	0.008	Beginning-Middle	-1.483	.14
	Middle	0.018	0.072	Beginning-End	-1.183	.24
	End	0.006	0.011	Middle-End	-0.296	.77

Note. **p* < .05.

Table 8
Rates Per minute of VAT, VOT and VIT in the Beginning, Middle, and End of the Fragments With Failure

Rate	Moment	<i>M</i>	<i>SD</i>	Comparison	<i>z</i>	<i>p</i>
VAT	Beginning	0.001	0.002	Beginning-Middle	-0.447	.66
	Middle	0.009	0.019	Beginning-End	-1.000	.32
	End	0.000	0.000	Middle-End	-1.000	.32
VOT	Beginning	0.053	0.057	Beginning-Middle	-0.730	.47
	Middle	0.069	0.070	Beginning-End	-0.365	.72
	End	0.039	0.047	Middle-End	-0.730	.47
VIT	Beginning	0.023	0.033	Beginning-Middle	-1.342	.18
	Middle	0.000	0.000	Beginning-End	-1.342	.18
	End	0.000	0.000	Middle-End	0.000	1.0

psychological interventions that have proven to be effective in order to improve our knowledge about the best way to deliver services that have the highest probability of achieving the goals of therapy.

Other limitations of this study are intrinsic to the clinical situation. Our results are purely correlational and we did not manipulate any independent variable (nor would it have been ethical to do so). Also, the complex mutual dependence between the therapist's and the patient's behavior makes it difficult to draw causal conclusions with certainty. Finally, some limitations derive from our current theoretical strategy in testing the hypothesis of verbal shaping. First, we did not analyze the therapist's nonverbal behavior. Although the latter may quite possibly contribute to clinical change, at this stage of our research we prefer to focus on verbal responses, which are easier to categorize and analyze sequentially. Second, and more importantly, on the patient's side we focused on verbalizations within the clinical session. What we defined as the "effectiveness" of Socratic fragments (total success, partial success, or failure) was clearly a case of *verbal effectiveness*: the overall extent to which the patient's verbal behavior approximated the therapeutic objectives. This definition makes sense with respect to our assessment of a possible process of verbal shaping, but leaves the

issue of clinical efficiency outside of the therapeutic sessions entirely open. Although it would be interesting to address this objective in future studies, we believe that a first step might be analyzing the interaction in order to try to explain how change occurs in the patient's verbal behavior with the application of the various intervention techniques used by clinicians.

Within these limits, we were able to gather empirical evidence consistent with the existence of a process of verbal shaping during clinical sessions. The results of our study provide some support for the two hypotheses to be tested. The therapist delivered differential consequences (approval versus disapproval) after some of the patient's verbalizations, and did so differently depending on their compatibility with therapeutic goals (see the top two lines of Figure 1 for example). Furthermore, Socratic fragments that were more or less effective in terms of overall verbal adjustment differed in terms of local relations between the patient's responses and subsequent approval/disapproval (Figure 1).

Although these findings may seem commonsensical, the exact way in which the more versus less successful fragments differed from one another proved informative. There were no notable differences in the way in which the therapist responded to the

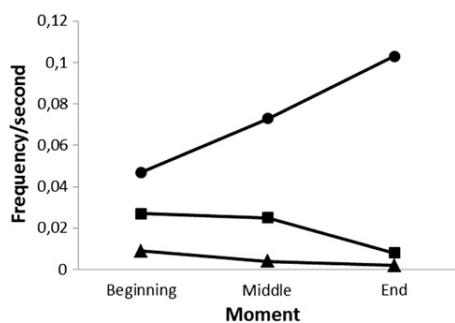


FIGURE 2 Progression of the rates of VAT, VOT and VIT in the totally successful fragments.

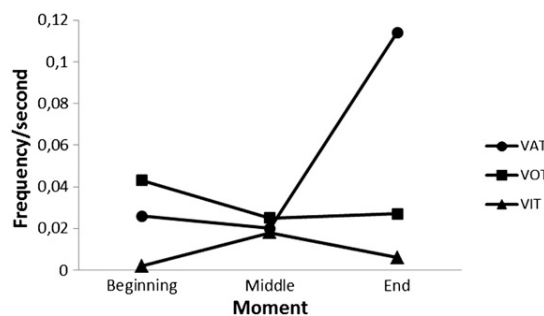


FIGURE 3 Progression of the rates of VAT, VOT and VIT in the partially successful fragments.

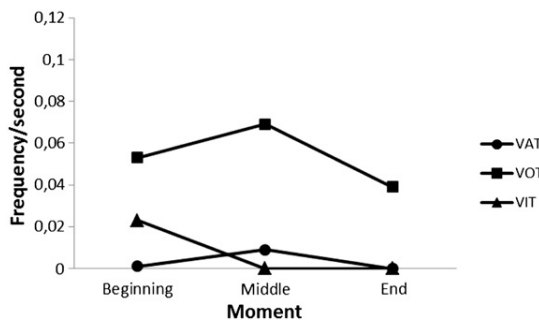


FIGURE 4 Progression of the rates of VAT, VOT and VIT in the fragments with failure.

verbalizations that were in agreement with the therapeutic objective (VATs) or the verbalizations opposed to the objectives (VOTs), among the three types of Socratic fragments. However, the difference in the sequential structure of successful and unsuccessful fragments concerned the relation of intermediate verbalizations (VITs) to the consequences delivered by the therapist. Less successful fragments were associated with fewer consistent relations

between VITs (verbalizations intermediate with respect to the therapeutic objective) and the therapist's approval/disapproval (Figure 1). If confirmed, this finding may have implications for clinical practice. As shown in the totally success fragments, in addition to adequately responding to the VATs (with approval) or the VOTs (with disapproval), it may be essential to the verbal (and clinical) success of the Socratic dialogue that the contingencies on intermediate verbalizations (VIT) are handled properly. It can be concluded that the therapist responds adequately in all cases of VATs or VOTs, in total or partial success and failure fragments. However, this doesn't happen with the more complex VITs, that need the therapist to quickly discriminate whether there are more approval- or disapproval-worthy contents in the patient's utterance. This is very often a matter of subtle degree. When the therapist's response to VITs is adequate, it means a better global performance of the therapist (total success), which makes sense considering all shaping processes must involve the reinforcement of behaviors that are progressively closer to the final established goal. If these successive approximations are not adequately reinforced, the shaping process is not being correctly undertaken. In other words, aspects of the patient's verbal approximation or distancing may have to be followed selectively by approval or disapproval in function of their distance from the current therapeutic objective: The therapist must discriminate between total or partial approximation or distancing from the target in order to decide in each instance whether to approve or disapprove the patient's behavior. These results are important because it is well known that questions of different types are to be posed during the Socratic method so as to encourage the patients to modify their verbalizations about concrete topics. However, most manuals do not clearly specify what the psychologist's behavior should be when responding to the patient's verbalizations.

In order to demonstrate the existence of a shaping process, it was also necessary to show that such selective punishment and reinforcement were linked to appropriate increases and decreases in patient behavior. In this way, the analyses carried out allowed us to obtain empirical evidence that was consistent with the existence of a process of verbal shaping. For instance, in the case of the totally successful fragments, the frequency of verbalizations in agreement with the therapeutic objectives (VAT) increased during the discussions and the frequency of verbalizations opposed to the therapeutic objectives (VOT) decreased, and we have interpreted that this may be due to the effect of the approval and disapproval that followed these verbalizations. This linear tendency of increases

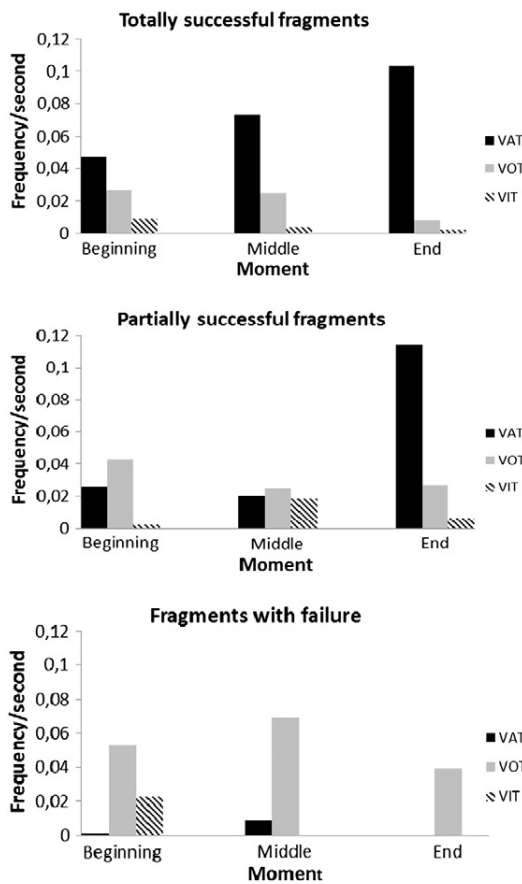


FIGURE 5 Resume of the evolution of VAT-VOT-VIT sorted by success level and moment.

and decreases was not seen in those cases of partial success, or in those categorized as failures. In those cases the shaping process was not as obvious and this surely was due to the fact that following the intermediate verbalizations (VIT), approval and disapproval were only applied in the totally successful cases and not in those which were partially successful or failures. In regard to the totally successful cases, the VITs that were reinforced, transformed into VATs as the conversation continued and those VITs that were punished, gradually decreased. This further demonstrates, keeping in mind the initial data, how important it is that the therapist provide clear consequences in response to the patient's verbalizations in order for the shaping process to be the most effective possible during the in-session Socratic dialogue.

From a theoretical standpoint, our data are relevant to the proposals by Hamilton (1988), Poppen (1989), Rosenfarb (1992), and Follette et al. (1996), according to which the repertoire of the person asking for psychological treatment is modified through the in-session shaping of verbal behavior. All of these approaches receive some degree of support with the current data, which documents specific associations between pairs of patient-therapist behavioral categories. From this perspective, the therapeutic interaction promotes change through the shaping of the patient's in-session verbalizations, followed by the transfer and generalization of what was learned in clinical context to the patient's everyday life (Pérez-Álvarez, 1996a, 1996b, 2004). The in-session interaction with the therapist may generate more adaptive, covert or overt verbalizations that allow patients to function more effectively in their daily life (perhaps through the function-altering effects of verbal rules: Schlinger & Blakely, 1987) and enable new therapeutic behaviors.

As far as we are aware, the present study is the first one in which the interaction between patient and therapist during the implementation of the Socratic method is analyzed empirically. We are only aware of two prior studies with similar methodologies: one being that of Truax (1966) and the other being the more recent studies of Functional Analytic Psychotherapy (Kohlenberg & Tsai, 1991), although neither one studied the same area as the present study, that of cognitive techniques. As we have argued in the Introduction, numerous process studies have been carried out on cognitive therapy (Arnkoff, 1986; Bennett-Levy, 2003; Dimidjian et al., 2006; Dobson et al., 2008; Garratt et al., 2007; Jacobson et al., 1996; Jarrett & Nelson, 1987; Longmore & Worrell, 2007; Muran et al., 1995; Szentagotai et al., 2008; Whisman, 1993; Zettle & Hayes, 1987). These studies have been conducted from a much more

general level of analysis that has not allowed for definitive conclusions to be drawn; that is, they did not allow a sequential analysis of patient-therapist interactions that resulted in changes in patient behavior towards a clinical goal. Thus, our conclusions are relevant because they are the first found using this level of analysis. Additionally, they demonstrate that a methodology of this sort can be used to analyze different aspects of process research that have not been explored in the past. Moreover, this methodology can be used not only in process research, but also to show therapeutic adherence and competence in outcome research. Any therapeutic approach needs to specify the active components of change, as well as a method of actually showing that the components influence behavior. Several approaches have defined methods for evaluating adherence and competence, but in many cases these methods have not been as precise as that which is utilized in the present study to analyze the therapist-patient interaction.

Nevertheless, much uncertainty remains with respect to the processes that underlie the clinical success of the Socratic method. Although our data are consistent with the hypothesis of an underlying shaping process, whether the adjustments we observed actually qualified as shaping in a strict sense- or whether they arose from a verbal process merely analogous to shaping (Alessi, 1992) remains an important theoretical issue. Although it is not dealt with in this article, the ultimate goal of this line of research is to understand the relationship between in-session changes in verbalizations and clinical improvements experienced outside of session. For this reason, the research on Functional Analytic Psychotherapy could prove to be useful in dealing with certain theoretical and methodological issues. Future studies may also address in a more detailed fashion the actual contents of verbal behavior during the clinical session, perhaps across different phases or segments of the Socratic dialogue. A comprehensive study of the therapeutic interaction would require for the bi directional influence of the therapist over the patient and vice versa to be analyzed; only some aspects of that bi directional influence have been studied here, but it would be interesting for future studies to examine whether the therapist has more impact on the patient than the patient does on the therapist, and to reflect the flexibility that the therapist must have to try to adapt the treatment to the patient. It also would be interesting to determine which homework assignments or guidelines best complement the Socratic method. Finally, future studies could compare the clinical efficiency of different therapists, only some of them trained in the application

of the Socratic method based on the present shaping model.

Conclusions

Although restricted by the nature of our data base, our results are consistent with a process of verbal shaping that underlies the Socratic method. In addition, the measures of inter-observer agreement in our study were over established minimum levels in most cases. The psychological meaning of the conclusions derived from these analyses lends further support to the measurement instruments we employed and confirms the usefulness of this methodology for analyzing the mechanisms of change that take place in clinical sessions. This methodological proposal is innovative and appears to be useful in process studies, opening the door for new forms of analyses that may prove to be useful for clinical practice.

Despite the limitations of the present study, we believe that it is a promising step toward unraveling of verbal interactions that define the Socratic dialogue, which paradoxically has been widely practiced but little analyzed. We hope that in the long run this kind of study will result in a higher efficacy and efficiency of the Socratic method and thus in higher quality interventions by psychologists in clinical practice.

Conflict of Interest Statement

The authors declare that there are no conflicts of interest.

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