

## INFLUENCE OF THE SUPPRESSION OF SELF-DISCREPANT THOUGHTS ON THE VIVIDNESS OF PERCEPTION OF AUDITORY ILLUSIONS

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**Abstract.** Based on the relationship between cognitive intrusions and auditory hallucinations established by Morrison and Baker (2000) and Morrison, Haddock and Tarrier (1995) the present study examines the possible effect of the repeated suppression of self-discrepant thoughts on the vividness of auditory illusions in a sample from a non-clinical population. Sixty-one participants were randomly assigned to a suppression of thoughts group ( $n = 31$ ) or a focalization of thoughts group ( $n = 30$ ) with different levels of self-discrepancy. After carrying out the task over a period of 48 hours, participants were presented with non-vocal auditory stimulation and asked to state whether they heard any verbalizations, and if so, how clearly. Results show how the repeated suppression of self-discrepant thoughts has a considerable effect on the vividness of illusions ( $F(1, 50) = 16.09$ ;  $p < 0.001$ ). The implications of these results for psychological therapy are analysed, with special emphasis on the importance of a research line based on acceptance.

*Keywords:* Thought suppression, self-discrepancy, auditory illusions.

### Introduction

There is a degree of consensus within the scientific community that hallucinations are private events attributed to an external source (Bentall, Haddock, & Slade, 1994; Frith, 1995; Heilbrun, 1980; Morrison, Haddock, & Tarrier, 1995). Nevertheless, authors disagree about the mechanisms responsible for this attributional process.

One of the latest models to be developed is that of Morrison et al. (1995). These authors have offered a “cognitive approach”, according to which the function of hallucinations would be to reduce the cognitive dissonance produced by a given cognitive intrusion (Morrison & Baker, 2000; Morrison et al., 1995). The hallucinator, in turn, rather than remaining indifferent to the appraisal of the hallucination, would produce a negative

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response, characterized above all by the use of safety-seeking behaviours (Morrison, 1998, 2001; Morrison et al., 1995), leading to an increase in the number of hallucinations, as shown in the literature on suppression of thoughts (Rassin, Merckelbach, & Muris, 2000).

From this model we can deduce the importance of two factors that would give rise to or maintain hallucinatory behaviour: the degree of cognitive dissonance produced by the content of certain thoughts and the carrying out of safety-seeking behaviours by the subject. To these factors we could add an assumption on which the model is founded, that of the continuity between hallucinatory experiences and cognitive intrusions. Similarly, Morrison et al. (1995) refer to the importance of certain metacognitive factors that are examined in more detail below (Baker & Morrison, 1998; Morrison & Haddock, 1997; Morrison, Wells, & Northard, 2000).

The theory of cognitive dissonance (Festinger, 1957) states that conflict between two types of cognition generates a state of personal unease that tends to be reduced through the modification of one of them. In this sense, the theory of cognitive dissonance forms part of the work of Higgins (1987, 1996) on self-discrepancy. The theory of self-discrepancy proposes the existence of three different types of domain in the self – actual, ideal and ought. The term actual self refers to representations of the attributes one believes to actually possess; ideal self refers to representations of the qualities one would like to possess; finally, ought self refers to the way one should be. It is also necessary to distinguish between self-concept, which Higgins (1987) equates with the actual self and self-guides, which refer to the “ideal self” and the “ought self”.

According to the theory of self-discrepancy, people try to achieve a state in which there is maximum proximity between self-concept and self-guides. If this is not the case, the result would be a type of negative emotion that differs according to the type of discrepancy, its magnitude, its accessibility, its applicability and its relevance in a given context, as well as the personal importance of the self-discrepancy (Higgins, 1999). Thus, according to Higgins, Bond, Klein and Strauman (1986), a subject’s self-discrepancy may be seen as a cognitive marker of the possibility of suffering some type of emotional disorder.

Of all possible self-discrepancies, the most relevant for the study of hallucinatory experiences is, in our view, that which is established between the actual self and the ought self, insofar as it is linked to emotions related to agitation and, above all, to guilt, fear and anxiety (Higgins, 1999; Higgins et al., 1986). In this regard, Morrison and Baker (2000) found that patients presenting auditory hallucinations consider their cognitive intrusions more anxiety-inducing than other patients and than a non-psychiatric control group. Moreover, the literature on hallucinations clearly shows the relation between anxiety and the occurrence of hallucinatory experiences (Bentall, 1990; Slade & Bentall, 1988). Chadwick and Birchwood (1994) show how a large part of the orders given by the voices have a clearly reprehensive moral content.

For their part, so-called “safety seeking behaviours” would have the purpose, according to the model, of preventing the danger to the individual’s mental integrity represented by the voices. Precisely for this reason, the person is never able to disconfirm his/her interpretation of the voices (e.g., their omnipotence, or that s/he would go mad if s/he failed to follow their instructions, etc.) (Chadwick & Birchwood, 1994; Morrison, 1998, 2001). In this regard, Morrison et al. (1995) have suggested the possible existence of a certain similarity between this type of safety seeking behaviours and the phenomena of thought suppression studied under experimental methodology (Clark, Ball, & Pape, 1991; Trinder & Salkovskis, 1994; Salkovskis & Campbell, 1994).

The literature on suppression of thoughts appears to indicate that this type of psychological strategy is characterized by having paradoxical effects, such as the well-known ‘rebound effect’ (Wegner, 1989). In a meta-analysis of controlled studies, it was found that the magnitude of this rebound effect is variable, and would depend on the nature of the target thought and the method by which thought frequency was measured (Abramowitz, Tolin, & Street, 2001).

It would seem, indeed, that attempts to control certain private events produce ‘ironic effects’ not only on thought suppression but also aspects as varied as concentration, emotional control, relaxation, pain, sleep and wakefulness, beliefs, self-presentation and prejudices (Wegner, 1994).

Furthermore, avoidance strategies, such as distraction, have been found to have a negative influence on the course of the symptomatology of psychiatric out-patients with diverse diagnoses (Vollrath, Alnaes, & Torgersen, 1996). Likewise, it has been shown that patients with hallucinations and delusions frequently use some type of cognitive control techniques (Carr, 1988), and that the most successful strategy used by patients that hear voices is that of accepting and assimilating the voice as a part of themselves (Romme & Escher, 1989). In contrast, distractive strategies such as watching television or listening to the radio are generally cited as making hallucinations worse (Nayani & David, 1996). Morrison and Wells (2000) found that schizophrenic patients use thought strategies characterized by greater concern, and based more on self-punishment, in comparison to a similar sample from a non-psychiatric population.

Nevertheless, the assumption of continuity is by no means exclusive to the model under analysis: it is a classical position to consider that the positive symptoms of schizophrenia form a continuum with other psychological processes (Strauss, 1969). As far as hallucinations are concerned, various theoretical explanations have been based on normal psychological processes to account for these types of experience. These explanations include those founded on the mechanism of classical conditioning (Davies, Davies, & Bennett, 1982) or operant conditioning (Skinner, 1974), those based on imagination (Horowitz, 1975), those that consider hallucinations as subvocal speech episodes (Green & Kinsbourne, 1990) and those that refer to a breakdown in self-monitoring (Blakemore, Smith, Steel, Johnstone, & Frith, 2000). In any case, and on the basis of multiple studies, the continuity of psychotic experiences in the general population has recently been defended (Johns & van Os, 2001).

The present study aims to test certain conclusions that could be drawn from the findings of the literature reviewed above. In the first place, we are interested in whether the repeated suppression of self-discrepant thoughts has any effect on the quality or vividness of the auditory illusions reported by a sample of a non-clinical population. Secondly, in order to demonstrate such an effect, we aim to ascertain whether this is due to suppression or discrepancy of thoughts, or to a combination of the two factors.

## Method

### *Participants*

Participants in the study were volunteers from psychology degree courses. Total number was 61, with 44 women and 17 men. Mean age was 21.63 years ( $SD = 2.87$ ).

### *Instruments*

*Assessment of self-discrepancy between ought self and actual self.* On the basis of the theory of self-discrepancy (Higgins, 1987, 1996), we prepared a questionnaire in which participants were asked to assess on a scale of 0 to 10 the degree to which 20 adjectives (e.g., intelligent, shy, sexy, firm, etc.) could be applied to them at present (actual self), and the degree to which they should, in their view, be applicable to them (ought self). Level of self-discrepancy was calculated by subtracting, for each item, the “actual self” score from the “ought self” score. Subsequently, discrepancies found for each item were added up to give a general score of the discrepancy between these domains of “self”. It should be pointed out that, after formation of the focalization and suppression groups, these did not differ significantly in terms of general self-discrepancy of their participants ( $t = .256$ ;  $p = .80$ ).

*Verbal summator test.* The verbal summator consists of a recording that repeats a pattern of speech sounds with low intensity or against a noisy background (Skinner, 1936). For the purposes of the present study, we removed the “vocal” qualities of the sound presented, converting it into a noise of brief duration with a monotonous repetition pattern. It has been shown elsewhere that the distinction between self-generated events and real auditory perception becomes more difficult for the subject when the signal/noise ratio is low (Bentall et al., 1994). The final result of the sound used in the research is similar to “white noise”.<sup>1</sup>

### *Procedure*

*Assignment of a task: suppression or focalization of thoughts.* After obtaining the scores from the self-discrepancy questionnaire, each subject was randomly assigned a task of focalization of certain thoughts ( $n = 30$ ) or their suppression ( $n = 31$ ). The focalization group was composed of 23 women and 7 men; the suppression group of 21 women and 10 men. Mean age of the focalization group was 21.10 years ( $SD = 2.11$ ), whilst that of the suppression group was 22.13 ( $SD = 3.39$ ). No statistically significant differences were found between groups in relation to the variable “age” ( $t = 1.39$ ;  $p = .17$ ).

Content of the thoughts to be suppressed or focalized referred to the personal area in which the participant’s self-discrepancy questionnaire score had been highest. If in that questionnaire no item had been given a value of 5 points or more, the participant was assigned an area in which his/her discrepancy was null (0). The purpose of this assignment procedure was to maximize, within each group, the differences between participants in terms of discrepancy of thoughts. This would allow the subsequent study of the possible effect of very high or very low self-discrepancy.

Table 1 summarizes the distribution of participants according to experimental group (focalization or suppression) and level of discrepancy of thoughts suppressed or focalized. It should be noted that, as occurred with general self-discrepancy, no statistically significant differences were found between groups in terms of self-discrepancy of thoughts ( $t = .42$ ;  $p = .967$ ).

<sup>1</sup> This material can be sent to people interested in the details of stimuli presented.

**Table 1.** Distribution of participants according to experimental group (suppression or focalization) and level of discrepancy of thoughts suppressed or focalized.

Experimental group		Discrepancy of thoughts						
		0	5	6	7	8	9	10
Suppression	<i>n</i>	12	7	2	7	1	1	1
Focalization	<i>n</i>	10	10	4	4	2	0	0
$\Sigma$	<i>n</i>	22	17	6	11	3	1	1

In accordance with the experimental condition assigned, participants were to attempt to suppress or focalize all the thoughts that occurred in relation to the “target” area until they were called back by the researchers. The instructions given to subjects in the suppression group stressed the importance of eliminating the target thoughts as soon as they appeared. Within this purpose, the subject was to think of the matter with sufficient emotional charge to distract attention from the thought in question. For ethical and privacy reasons, participants were not required to tell the experimenter the nature of the “alternative thought” chosen. For the focalization group, the instructions given were that, as soon as a target thought appeared, participants were to simply note it down and continue with what they were doing. In either condition, subjects were asked to note on a self-report sheet the place and time these target thoughts occurred. After instruction in this, participants were requested to carry out the task three times in the presence of the researcher, by way of a trial. Thus, they were asked to evoke a thought related to the target area and try to either suppress it or focus on it. Immediately afterwards, they were asked whether they had had any difficulties for carrying out the task, and any doubts arising were dealt with.

*Verbal summator test.* After 48 hours, participants were called back. Their self-report sheets were collected and they were presented, for a period of 3 minutes, with a stimulus consisting in a repetitive pattern of noise, similar to Skinner’s (1936) verbal summator. Given that the recognition of vocal patterns is strongly determined by the context in which the test is carried out (Skinner, 1936, 1957), the verbal summator was presented to the participants as they sat in a relaxing armchair facing a white wall. Their task consisted in highlighting (saying out loud) any sound they believed to hear. The instructions given were as follows:

Please sit down and relax. You are going to hear a recording. Your task consists simply in saying out loud the phrases or words you think you hear. It doesn’t matter if you’re not very sure. Just say out loud everything you think you hear.

When participants had finished the task they were asked to indicate, on a scale of 0 to 10, the quality with which they had heard words or phrases, with 0 corresponding to zero quality (they heard nothing) and 10 to maximum quality (equivalent to the clarity with which, at the moment, they could hear the researcher).

**Table 2.** Means (and standard deviations) for number of thoughts (NT) reported by participants during the 48 hour recording period and quality of illusions (QI) indicated during the verbal summator task.

Group	Self-discrepancy							Global
	0	5	6	7	8	9	10	
Suppression								
NT	4.25 (3.84)	3.43 (3.15)	3.00 (1.41)	7.14 (6.74)	0.00 (0.00)	0.00 (0.00)	12.00 (0.00)	4.61 (4.67)
QI	0.42 (0.79)	3.43 (3.21)	6.50 (3.54)	2.57 (2.76)	0.00 (0.00)	0.00 (0.00)	8.00 (0.00)	2.19 (2.92)
Focalization								
NT	6.40 (7.12)	4.30 (3.33)	3.50 (4.04)	4.75 (3.40)	5.00 (4.24)	no participants		5.00 (4.88)
QI	1.20 (1.55)	1.00 (1.89)	1.75 (3.50)	0.50 (1.00)	0.50 (0.71)			1.06 (1.83)

## Results

Table 2 shows the means and standard deviations found for the suppression and focalization groups, for both number of thoughts during the 48 hours recording period and quality of illusions during the verbal summator task.

With the aim of discovering whether the repeated suppression of discrepant thoughts can account for the quality of the illusions reported by participants in the verbal summator test, controlling the possible effect of discrepancy of the thoughts, an analysis of covariance (ANCOVA) was carried out. Independent variable was suppression or focalization task, and covariate was discrepancy of thoughts. It should be borne in mind, of course, on performing this ANCOVA, that not all participants carried out the experimental task the same number of times; the number of thoughts suppressed or focused upon by participants over the 48 hours prior to the presentation of the verbal summator varies, as shown by the self-reports handed in to the researcher.

Thus, if we are to remain faithful to the theoretical model, we should consider, on performing the statistical tests, the number of thoughts the participants have had. Bear in mind in this regard that the greater the number of thoughts, the more the participant has carried out the experimental task assigned and, therefore, the more valid the results. Thus, we included in the analysis, as a weighting factor, the number of thoughts participants had had, as reflected in their self-report. This weighting factor gives greater weight in the ANCOVA to the scores of those subjects recording a higher number of thoughts before the presentation of the verbal summator. In relation to this, it is important to point out that the suppression and focalization groups did not differ significantly in terms of number of thoughts recorded prior to presentation of the verbal summator ( $t = 1.808$ ;  $p < .77$ ). Table 3 shows the results of the ANCOVA.

It can be seen that the task (suppression or focalization) assigned is statistically significant ( $F(1, 50) = 16.09$ ;  $p < .001$ ), as is self-discrepancy of the thoughts suppressed or focalized

**Table 3.** Analysis of covariance for quality of illusions

Source	<i>df</i>	<i>F</i>	$\eta^2$
Suppression/Focalization	1	16.09***	.24
Self-discrepancy	1	11.29***	.18
<i>S</i> within-group error	50	(24.56)	

*Note.* Weighted least squares. *Number of thoughts* have been used as weighting factor. Values enclosed in parenthesis represent mean square errors. *S* = subjects.

\*\*\* $p < .001$ .

( $F(1, 50) = 11.29$ ;  $p < .001$ ). The degree of influence of both variables on quality of the illusions reported by participants is considerably high, as indicated in the final column of the table, which shows effect size (eta squared). Thus, the task of suppression or focalization explains by itself 24% of the total variability observed in the sample, whilst the covariate explains 18%.

Given that the two variables appear to be relevant, it would be interesting to examine the pattern of interaction they present. Simply for the purpose of understanding the relation between the two factors, the variable ‘‘discrepancy of thoughts’’ can be divided in two levels (low discrepancy and high discrepancy), according to whether participants have had to suppress or focalize thoughts from an area with null (0) discrepancy or with a discrepancy of 5 or more. For the reasons explained in the account of the previous analyses, we introduced as a weighting factor the number of thoughts participants had had. Table 4 shows the results of the ANOVA.

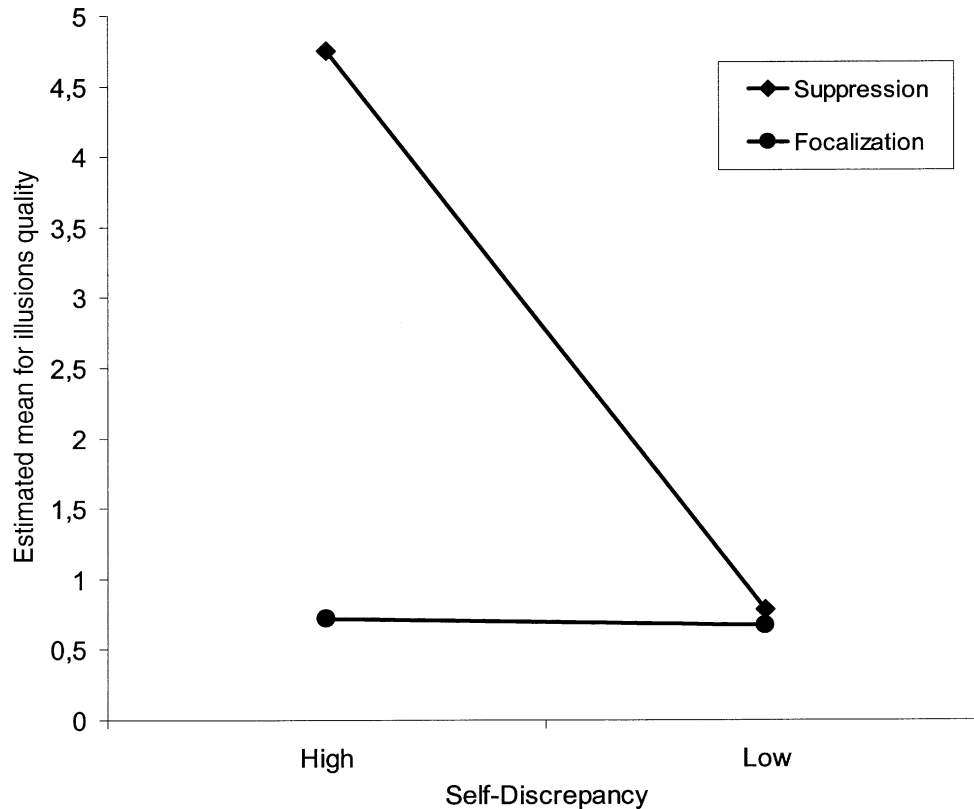
As can be seen, statistical significance was found for suppression or focalization of thoughts ( $F(1, 49) = 14.716$ ;  $p < .001$ ), for high or low level of discrepancy ( $F(1, 49) = 13.829$ ;  $p < .001$ ) and for the interaction of the two factors ( $F(1, 49) = 13.161$ ;  $p < .001$ ). Likewise, the percentage of variance explained by each of the factors and by their interaction is quite similar. Twenty-three percent of the variance is explained by the task of suppression or focalization, 22% by the degree of discrepancy, and 21% by the interaction of the factors. In this type of design, when the interaction is significant it should be closely examined.

**Table 4.** Analysis of variance for quality of illusions

Source	<i>df</i>	<i>F</i>	$\eta^2$
Suppression/Focalization ( <i>S</i> )	1	14.71***	.23
Self-discrepancy ( <i>D</i> )	1	13.83***	.22
<i>S</i> × <i>D</i>	1	13.16***	.21
<i>S</i> within-group error	50	(20.19)	

*Note.* Weighted least squares. *Number of thoughts* have been used as weighting factor. Values enclosed in parenthesis represent mean square errors. *S* = subjects.

\*\*\* $p < .001$ .



**Figure 1.** Estimated mean for quality of illusions reported by participants depending on the level of thoughts discrepancy (high or low) and the experimental task (suppression or focalization). Weighting factor: number of thoughts.

Thus, Figure 1 shows the estimated marginal means of quality of the auditory illusions as a function of whether participants had been assigned a task of focalization or suppression of thoughts, and of whether these thoughts referred to an area of high or low discrepancy.

We can clearly observe the important role of the interaction between suppression and discrepancy. In this type of graph, it would be wrong to state that suppression alone increases the values of the quality of the illusions (León & Montero, 2001). From the graph it can be seen that the effect of either of the two variables considered is equivalent to their interaction.

### Discussion

We believe the present study supports the basic assumptions to the hypotheses that can be deduced from the model of Morrison et al. (1995) with regard to the mechanisms of production and maintenance of auditory hallucinations. On the one hand, it is demonstrated that the suppression of self-discrepant thoughts has a decisive influence on the quality or vividness of auditory illusions reported by a non-clinical sample. On the other hand, it is seen how, in order to produce a significant effect, it is necessary for self-discrepant thoughts to coincide



with attempts to suppress them. Neither of these two factors in isolation would be sufficient. As can be seen in Figure 1, when discrepancy of thoughts is high, suppression indeed increases the quality of the illusions reported by participants; on the other hand, when discrepancy of thoughts is low, their suppression or focalization has no effect whatsoever.

Morrison and Baker (2000) have shown that patients with auditory hallucinations present a high number of cognitive intrusions. The present authors would add, based on this research, that discrepancy of thoughts and what the person does with them (suppression or focalization) are fundamental aspects that should be taken into account. The results obtained lead us to postulate a functional equivalence between certain types of auditory hallucinations and other psychological problems involving the suppression of private events. Such would be the case of cognitive intrusions (Morrison et al., 1995) and bodily sensations associated with panic attacks (Morrison, 1998), which have been specifically considered from the model on which the present study is based.

In a more general way, auditory hallucinations could be seen as constituting a particular case of what is known as “Experiential Avoidance” (EA) (Hayes, Wilson, Gifford, Follete, & Strosahl, 1996; Luciano & Hayes, 2001). EA would occur when a person is not disposed to make contact with his/her private experiences as they are, and behaves in a deliberate way to alter both the form and frequency of such experiences and the conditions that generate them (Hayes et al., 1996). Generally, this behaviour pattern is apparently effective in the short term, but if it becomes chronic it can, in the long term, lead to limitations in the person’s life (Luciano & Hayes, 2001). On this basis, it could be assumed that the suppression of self-discrepant thoughts and the external attribution involved in any auditory hallucination are part of the same functional class. This, in our view, would explain the effect found in the present study. It is thus understood that those participants who managed to escape through the suppression of thoughts with certain self-discrepant content equally put into practice other forms of escape, such as perceiving a thought as belonging to someone else.

With regard to the consequences for psychological therapy applied to voices, we believe the present study indicates the appropriateness of a therapeutic intervention based on either acceptance or focalization, given that a feature they have in common is that they, so to speak, “avoid avoidance” (García-Montes & Pérez-Álvarez, 2001).

As far as the therapy of focalization (Bentall et al., 1994) is concerned, it should be pointed out that it has been seen to be more effective than distraction techniques when the aim is to achieve a re-attribution of voices after 2 years of follow-up (Haddock, Slade, Bentall, Reid, & Faragher, 1998). For its part, acceptance is clinically relevant in those situations that constitute a conflict (Dougher, 1994). In our view, such would be the situation of a patient with auditory hallucinations for whom achieving the suppression of an initial negative affect (self-discrepancy of certain thoughts or voices) would lead to aversive consequences in the longer term. These consequences would be not only a greater number of such thoughts, as shown by the literature on suppression of thoughts (Clark et al., 1991; Salkovskis & Campbell, 1994; Wegner, 1989), but also, as the data presented here seem to indicate, greater vividness of auditory hallucinations. The crucial aspect, then, is not so much the elimination or suppression of the subject’s self-discrepant cognitive content, as the production of a “distancing” of the person with respect to such content. In this sense, the philosophy of intervention proposed would be close to the cognitive approach of Chadwick, Birchwood and Trower (1996), who consider as the aim of their therapy for voices not the

elimination of hallucinatory activity, but rather the weakening of the cognitions responsible for the unease produced by the voices; in sum, a change in the context from which hallucinations are considered by the patient.

Precisely because of the important role played by the interaction of the suppression and discrepancy of thoughts, we consider it insufficient to substitute the mechanisms of suppression by others of focalization; an effective intervention should also deal with the patient's self-discrepancy. In this regard, the application of new cognitive-behavioural therapies, such as Acceptance and Commitment Therapy (Hayes, Strosahl, & Wilson, 1999), may prove useful, as long as an appropriate context is available for carrying them out (Bach & Hayes, 2002; García-Montes & Pérez-Álvarez, 2001). In the same direction, a therapeutic approach whose objective was to change beliefs about the form and function of the voices, or of certain types of thoughts, could be particularly useful (Morrison, 2001). Likewise, in future research it would be interesting to take into account not only the discrepancy between the "actual self" and the "ought self", but also that which is produced between other domains of "self". In this regard, it would be extremely useful to consider the personal importance of each area for the subject, that is, the "ideal self".

Other potentially relevant factors, yet to be analysed, are related to the influence of certain metacognitive variables on the quality of auditory illusions. It would be particularly interesting to know the effect that metacognitions may have according to the task (suppression or focalization).

Finally, it is important to point out that the conclusions established in this work rest on the assumption that the "quality of auditory illusions" is a variable that may be useful for studying in non-clinical populations similar experiences to those presented by psychiatric patients, and insofar as the "vividness" with which auditory illusions are perceived satisfies the principle of continuity that provides the framework for the present research. Even so, we clearly do not pretend to establish an equivalence between the experiences referred to by certain participants in the research and those of patients with auditory hallucinations. We simply aim to describe a methodology that may be of interest in the study of different psychopathological models in non-clinical populations.

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