

# EFFECTIVENESS OF INDIVIDUAL COGNITIVE-BEHAVIOURAL THERAPY APPLIED TO PSYCHOTIC SYMPTOMS. 1. REVIEW OF SINGLE-CASE EXPERIMENTAL DESIGNS APPLIED TO THE TREATMENT OF DELUSIONAL BELIEFS

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*This work presents a review of cognitive-behavioural treatments applied to the reduction or elimination of delusions. Also discussed are the effectiveness of these operations in cases in which single-case experimental designs have been used, the possible utility of predictors of these treatments and the methodological problems found.*

*Se presenta una revisión de los tratamientos cognitivos-conductuales aplicados para la reducción o eliminación de las ideas delirantes en sujetos psicóticos. Se analiza la eficacia de estas intervenciones en aquellos casos en los que se han utilizado diseños experimentales de caso único, los posibles predictores de eficacia de dichos tratamientos y los problemas metodológicos encontrados.*

The application of cognitive-behavioural therapy to delusional beliefs in psychotic patients is still in its early stages. Despite the fact that the first description of the use of this type of technique was made by Beck (1952) almost half a century ago, it was only in the 1990s that the number of publications on this topic and the interest of clinical psychologists and psychiatrists –mainly British– began to increase. This delay in the development of the field may be related to several factors:

1. The very concept of *delusional belief* proposed by Jaspers (1963), and the current psychiatric classifications, have arrested the development of applied psychological interventions for this type of problem. Jaspers defined delusions as false judgements maintained with extraordinary conviction, that are impermeable to experience and counterarguments, and whose content is unworkable/impossible to realise (Jaspers, 1963). By definition, then, from this perspective the psychological treatment of delusional beliefs made no sense. Hence, throughout practically the whole of this century delusions have been considered as an epiphenomenon, as a secondary expression of more profound conditions.
2. The failure of traditional therapies in the treatment of schizophrenia. Mueser and Berenbaum (1990),

after an extensive review of studies of the effectiveness of psychodynamic therapies, concluded that such interventions had not been shown to be effective in the treatment of schizophrenia; they compared them to pharmacological treatment, alleging that should any drug with the effectiveness rate of psychodynamic therapy come onto the market it would immediately be withdrawn. This has created a culture among clinical psychologists, lasting many years, of non-intervention with regard to delusions and psychotic symptoms in general, with their attention being concentrated on other, “lighter” types of pathology, such as neurotic and affective disorders.

3. The decrease in the number of behavioural-type interventions in psychotic disorders during the 1980s. Bellack (1986) explained this decrease as resulting from the following beliefs of behavioural psychologists: a) schizophrenia does not exist as a behavioural disorder, b) schizophrenia is a biological disorder, c) it is to be treated with drugs, and d) it is too serious to be treated with behavioural therapy.

However, and regardless of the above, over the last 25 years there has been a token appearance of studies reporting the efficiency of such interventions on delusional beliefs in isolated cases and series of cases. These works have been characterised by a methodology of pre-experimental type, which does not permit us to draw reliable conclusions about the efficacy of the techniques (Watt, Powell and Austin, 1973; Johnson, Ross and Mastria, 1977; Milton, Patwa and Hafner, 1978; Hole, Rush and

The original Spanish version of this paper has been previously published in *Apuntes de Psicología*, 1999, Vol. 17. No 1 and 2, 31-48

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Beck, 1979; Hartman and Cashman, 1983; Kingdon and Turkington, 1991; Cuevas and Perona, 1997). Chadwick and Lowe (1999) criticised the single-case studies described in the literature, in which they detected the following problems:

1. The majority of studies lack baseline observations. Even though we may have evidence that delusional beliefs have been present in the subject in question for many years, baseline data are necessary, since, before any kind of intervention, it is very important to establish how the delusional belief and other behaviours of interest vary over time. Only then can changes subsequent to the intervention be considered in the context of the variability or stability of the baseline data, making possible the drawing of valid conclusions about the effectiveness of the treatment.
2. Interventions have not always been evaluated systematically, and it has therefore not always been possible to compare the effects of the different manipulations of the treatment in different phases of the intervention, in different subjects, behaviours, environments, etc.
3. Generally, diverse and undifferentiated techniques have been used within the same intervention programme, so that it has not been possible to analyse the effectiveness of the treatment according to its components.
4. Finally, these authors underline the lack of follow-up studies, that is, of assessment of the permanence of the effects once the treatment is completed.

Nevertheless, also described in the literature are studies that have used an experimental-type methodology, as in single-case experimental designs (Barlow and Hersen, 1988), which fulfil in a rigorous way some or all of the requirements for their validity (Alford, 1986; Chadwick and Lowe, 1990; Lowe and Chadwick, 1990; Himadi and Kaiser, 1992; Chadwick, Lowe, Horne and Higson, 1994; Chadwick and Trower, 1996; Sharp, Fear, Williams, Healy, Lowe, Yeadon and Holden, 1996). We consider crucial the introduction of this type of methodology, as against the traditional designs comparing groups, for the study of the effectiveness of psychotherapeutic treatments, given the conceptual and methodological problems involved in the latter approach (Arias Holgado, Fernández Serra and Perona Garcelán, 2000, *Revista Latinoamericana de Psicología*, 32(2), 227-300).

In the present work we shall carefully review these studies. To this end we have classified them in two groups: on the one hand, a study using a reversion design, and on the other, those that used a multiple-baseline design.

## **INDIVIDUAL COGNITIVE-BEHAVIOURAL THERAPY IN A REVERSION DESIGN APPLIED TO A SINGLE-CASE**

From a chronological point of view, we should first consider the now classic work by Alford (1986). This author applied a cognitive-behavioural treatment to a schizophrenic patient aged 22 who had for three years been suffering from a disorder involving delusions and hallucinations, and who did not respond to pharmacological treatment. For two years he had been in a psychiatric hospital, where he received the treatment we shall now describe.

The intervention was planned in accordance with a reversible experimental design of the type ABAB (Barlow and Hersen, 1988), in which the following were considered as measures of results or dependent variables: daily frequency of appearance of delusional beliefs and voices, and degree of patient's conviction in these beliefs, rated on a scale of 0 to 100, where 100 meant that the patient considered them as totally real (Hole, Rush, and Beck, 1979).

The treatment consisted, on the one hand, in showing the patient how to make self-reports with daily assessment of the two dependent variables mentioned above, and to write an alternative, non-delusional interpretation, these self-reports providing social reinforcement; and on the other hand, in two or three sessions per week with the therapist working on the self-reports and, in collaboration with the patient, questioning the evidence on which each of the beliefs was based.

The patient responded well to the self-report activity, with 100% fulfilment of the task of writing alternative interpretations for his delusional beliefs. Over the course of the treatment there was observed a significant decrease of both frequency of the delusional beliefs and voices and degree of conviction in them. Although Alford did not record quantitative data in the follow-up, he reported that a partial improvement persisted 3 months after the intervention. More specifically, the patient continued to complain of hearing voices occasionally, but with doubts as to their origin, giving more weight to the hypothesis that they were the product of his imagination. With regard to the delusions, although they were still partially present, the researchers noted an increase in the subject's ability to monitor and assess in a critical way his own thoughts.

Although this work provides interesting data with regard to the efficacy of the intervention, we consider that the type of design used is not the most appropriate,

given the doubts about its internal validity. It is likely that the characteristics of the dependent variables used are not reversible, that is, withdrawal of the treatment would not necessarily imply a return to the baseline values. In fact, visual analysis of the graphs shows how in the second baseline phase, with the withdrawal of the treatment, and in contradiction to the logic of these designs, there is no increase in the subject's degree of conviction in the delusions. The same author attempts to explain this data by stating that the subject may have continued, during this baseline period, to use the strategies learned with the therapist, so that the intervention had a cumulative effect that impeded reversion. On the other hand, the degree of conviction of the subject during the first baseline period varied between 40 and 80 percent, which shows that prior to the treatment the conviction was not particularly stable, calling into question the claim that the independent variable considered was the principal factor of change. Moreover, and in relation to this point, it should be added that the author did not control the amount of neuroleptic drugs taken by the subject during the treatment, but varied the dose in each one of the phases according to the state of the patient.

## MULTIPLE-BASELINE EXPERIMENTAL DESIGNS

Chadwick and Lowe (1990), Lowe and Chadwick (1990), Chadwick, Lowe, Horne and Higson (1994), Himadi and Kaiser (1992), Chadwick and Trower (1996), and Sharp and cols. (1996) presented a series of works in which they attempted to apply experimental designs that would allow them to draw more reliable conclusions with regard to the treatment studied. Given the doubts raised in this context by Alford's ABAB reversion experimental design, they proposed the application of multiple-baseline designs in their different varieties (Barlow and Hersen, 1988). The logic of this type of design does not necessitate a reversion of the values of the dependent variable for drawing conclusions about the influence of the treatment, but is based rather on comparison of the data of two or more individuals, behaviours or situations; the treatment is introduced progressively, and it is observed whether, as a function of the different manipulations of this independent variable, changes occur in the dependent variable. In this way, the problem of the supposed irreversibility of the treatments can be avoided. Before analysing the results obtained, we shall briefly describe the methodology employed in these studies.

As mentioned earlier, the multiple-baseline designs used in these studies are between-subjects (Chadwick and Lowe, 1990; Chadwick, Lowe, Horne and Higson, 1994; Sharp and cols., 1996) and between-behaviours (Lowe and Chadwick, 1990; Himadi and Kaiser, 1992; Chadwick and Trower, 1996), and include, as an innovation in this field, a thorough description and operationalization of the different phases and components of the intervention. The procedure of the cognitive-behavioural intervention can be summarised as follows:

**Phase 1: Preliminary interview.** This consists in one or two interviews carried out with each subject, the objectives of which are to define the target beliefs to be modified and to establish a good rapport between therapist and patient.

**Phase 2: Baseline.** This phase involves the collection of all relevant data on the delusional beliefs and the evidence supporting them. Moreover, the forms and scales necessary for quantitative measurement of the target beliefs are administered.

**Phase 3: verbal challenge.** This is the first component of the intervention. It consists in encouraging the subject to consider the delusional belief as a possible interpretation of events. At no time is the patient told that his or her interpretation is erroneous; s/he is simply told that it is one alternative among others, and stimulated to offer other alternatives and critically evaluate them. In sum, the strategy is, first, to discuss the evidence the subject provides to demonstrate the veracity of each one of the delusional beliefs, rather than the delusion itself, but always from a perspective based on collaboration, not on confrontation; second, to question the internal coherence and plausibility of the patient's system of beliefs; third, to redefine the delusions as a comprehensible way of making sense of the patient's anomalous experiences; and finally, to formulate alternative interpretations of events and to analyse each of these alternatives according to the information and evidence available.

**Phase 4. Reality test.** Where it has not been possible in the previous phase to modify the delusional beliefs, the patient him/herself plans, jointly with the therapist, a series of actions and activities to check empirically the veracity (or falseness) of the delusions.

On the basis of a previous study by Brett-Jones, Garety and Hemsley (1987), which conceptualised delusions as a continuous and multidimensional dependent variable, the above-mentioned authors measured the degree of conviction, preoccupation and anxiety with regard to

delusional beliefs, using a version modified by Phillips (1977) of Shapiro's (1961) Personal Questionnaire (PQ). Conviction refers to the extent to which the subject considers his/her belief to be true at the moment of evaluation; preoccupation refers to the frequency with which the subject has thought about these beliefs during the previous week; and the anxiety measure evaluates the level of anxiety felt by the subject when thinking about the delusional beliefs, also during the previous week. Each one of these variables is assessed on an ordinal scale of 6 points (for more information, see Brett-Jones et al., 1987 and Drury, 1995).

Also employed was another measure of the degree of conviction based on the work of Hole, Rush and Beck (1973). This consists in asking the patient to state the percentage of conviction s/he has in each of his/her delusional beliefs, where zero is the subject's minimum level of conviction and 100 the maximum.

Again following the work of Brett-Jones et al. (1987), they measured two constructs that these authors called "accommodation" and "reaction to hypothetical contradiction". The *accommodation* measure refers to the awareness demonstrated by the subject in the face of recent events that contradict the truth of his/her beliefs. At the beginning of each session the patient is asked whether in the previous week anything has happened that in any way calls into question his/her beliefs. *Reaction to hypothetical contradiction* is assessed only two and four weeks after the baseline. The measure is used for assessing individual potential for adaptation to tests incompatible with his/her belief. The patient is offered a hypothetical, but plausible and specific, test that contradicts his/her belief, and asked how it affects him/her. For Brett-Jones et al. (1987) this measure is of great interest, since it may have certain predictive value for identifying those subjects with greater probability of recovery.

Finally, some works have applied Beck's Depression Inventory (BDI) to measure the mood of each patient before and during the treatment and in each of the follow-ups subsequent to it. Drug dosage was maintained constant throughout all of these single-case experiments.

## **BETWEEN-SUBJECTS MULTIPLE-BASELINE DESIGNS**

In a first study, Chadwick and Lowe (1990) applied a between-subjects multiple-baseline design to assess the overall effectiveness of this type of intervention (that is, without analysing the effectiveness of the verbal challenge component compared to the reality test compo-

nent) on the delusional beliefs of six schizophrenic subjects.

With the aim of simplifying the presentation of the results obtained in the dependent variable *conviction*, we shall present only the percentages of conviction, since these showed a high correlation with the same measure obtained in the PQ.

In contrast to the work of Alford (1986), referred to above, the percentage of conviction during the baseline periods was quite stable in the six subjects, around 100% in all of them. In the treatment phase, in two subjects the degree of conviction fell below 50%, one of them needing a reality test to bring down the percentage. In the follow-up phase these results were maintained at one month, three months and six months. In another two subjects, level of conviction fell to zero, one of these also requiring a reality test. In the follow-up period they maintained the results obtained during the treatment. In another subject there was also a drop in degree of conviction during the treatment, but this was quite unstable, swinging between values of 30 and 80 percent, and decreasing slightly during the follow-up. Finally, the remaining subject's level of conviction remained unchanged both during the treatment and in the follow-up period.

In this work it can be seen that in the intervention phase the verbal dispute component produced a considerable reduction of conviction in the delusional beliefs of four of the six subjects, and that the reality test component reduced the conviction level in two of the three subjects to whom it was administered. On the basis of these results it can be stated that this type of treatment, in the conditions in which it was applied, appears to offer positive and encouraging effects in the treatment of schizophrenic subjects. However, we cannot go so far as to make an analysis of the effectiveness of the two treatment components. Specifically, it cannot be affirmed that the reality test alone is sufficient to achieve positive results, since it was not necessary for all subjects, and when it was applied, it was always subsequent to the verbal dispute component.

These same authors (Chadwick, Lowe, Horne and Higson, 1994) carried out a partial replication of the previous work, whose objective was to study the effectiveness of the reality test phase itself as against that of verbal challenge. They also applied a between-subjects multiple-baseline design, in whose treatment phase the order of the components was inverted, that is, they applied first the reality test and then the verbal challenge component.

4 subjects participated in this study, of which three were schizophrenics and one suffered from a schizoaffective disorder. During the baseline phase three of them maintained 100% conviction in their delusional beliefs; the values for the fourth subject ranged between 80% and 100%.

With regard to the effectiveness of the reality test component, three of the four subjects presented no changes in the percentage of conviction, with values remaining practically at 100%. In the remaining subject, the first reality test session produced a sharp drop in conviction level, to zero percent; in the following sessions, however, it returned to the initial baseline values. On the other hand, as soon as the verbal challenge component was applied the percentage of conviction fell to levels of 0% in three of the four subjects. During the follow-up phase at one month, three months and six months it was observed that in the subjects in which the level of conviction in their delusional beliefs had fallen to practically 0%, a slight increase occurred, though this never exceeded 50%.

Chadwick and collaborators concluded that the reality test in itself is a weak kind of intervention for modifying the delusions of a schizophrenic patient, perhaps because their strongly-held beliefs are immunised against the empirical tests whose aim is to disprove them. However, in the first study cited (Chadwick and Lowe, 1990) it was observed that when it followed the verbal challenge component the reality test was effective, even when the verbal intervention had little or no impact on conviction. Thus, taken together, these two studies contribute data in support of the hypothesis that the reality test is more effective when it is applied after verbal confrontation (Trower, Casey, Dryden, 1988). In any case, it is necessary to carry out further research to confirm this hypothesis.

Sharp and collaborators (1996) replicated Chadwick and Lowe's procedure of confrontation, but in contrast to their study, whose patients met the criteria for diagnosis as schizophrenics, Sharp's patients met the criteria of delusional disorder, according to the DSM-III-R (American Psychiatric Association, 1987).

The results showed a modest reduction in the percentage of conviction in delusional beliefs in three of the six subjects that participated in the study, with none of them reaching zero percent: in subject 1 the values of conviction level ranged from 25% to 75%; in subject 2 they ranged from 20% to 70%; and in subject 5 they ranged from 30% to 90% throughout the treatment phase. Unfortunately, Sharp and collaborators did not carry out any type of follow-up.

An interesting observation that can be made with regard to the results of this study is that while the baseline values of the patients that presented no modification in conviction levels remained stable (at 100%), the subjects in which changes occurred presented unstable baseline values, with small oscillations over this period. It may be interesting in future research to investigate the relationship between stability of conviction in the delusional beliefs before the intervention and the results of the therapy, given that, if this relationship were to be replicated in other studies, we might consider the stability of the beliefs before the treatment as a valid predictor of results.

### **BETWEEN-BEHAVIOURS MULTIPLE-BASELINE DESIGNS**

Cognitive-behavioural interventions have also been carried out using a between-behaviours experimental design (Lowe and Chadwick, 1990; Himadi and Kaiser, 1992 and Chadwick and Trower, 1996). This type of design has been used to check the effectiveness of the intervention when the subject presents more than one delusional belief and the aim of the work is to study the differential effect of this type of intervention as it is applied to each one of the target beliefs.

In the first of these (Lowe and Chadwick, 1990), the methodology and procedures previously described were used in two schizophrenic subjects, in both of whom the delusions were confronted successively at intervals of four or more weeks. Each of them presented three delusional beliefs. In one subject, the first target belief was that a woman called Amanda was able to read his thoughts and control his life, the second was that in a previous life he had been Leonardo da Vinci, and the third was that in a previous life he had been Jesus Christ. The target beliefs of the other subject (a woman aged 51) were, first, that she was fifteen years old, second, that she was the daughter of Princess Anne of England, and third, that the British government controlled her thoughts and actions.

In both patients the intervention was quite effective, achieving conviction levels of 0% during the treatment, and this result was maintained at the one-month, three-month and six-month follow-ups.

In our view, the most interesting aspect of this study is that, in the second subject, as each belief was dealt with, the subject's conviction level decreased drastically, demonstrating the effectiveness of the independent variable used. However, in the first patient there was

observed a certain generalisation of the treatment between the second and third delusional beliefs. Since both beliefs related to the subject's supposed identity in previous lives (Leonardo da Vinci and Jesus Christ), we can speculate that they were closely related in terms of the arguments and evidence employed by the subject to maintain them. This leads us to suppose that the questions posed and alternatives suggested by the therapist for one of them probably served also to undermine the conviction levels with regard to the other; although topographically the beliefs were different, they were perhaps similar in functional terms.

Himadi and Kaiser (1992) applied the same type of design to a patient diagnosed as suffering from a schizophrenic disorder of an undifferentiated type, who had been an in-patient at a psychiatric hospital for 18 years. This patient presented ten different delusions, all on a grand scale: he believed to be in control of all the activities of the US government, and that he was the owner of a gold mine and of the mint of his country; he claimed to have extensive knowledge as a result of many years of study (in fact he had only two years of formal education); he could destroy the world if he so desired; he was the forgotten son of Jesus and Mary; his brain had been surgically extirpated; his parents were impostors; one of his brothers was "Ironman" and he possessed similar powers himself.

The main dependent variable was degree of conviction in the delusional beliefs, measured using the strategy of percentages; also, two measures were used to assess the degree of generalisation of the treatment: an interview carried out by an independent assessor and the application by another assessor of Andreasen's (1984) SAPS scale. All of these measures were applied before and after the treatment and in the follow-up at one, two, four and six months.

Just three of the delusional beliefs were selected as objectives of the intervention, according to their conviction levels during the baseline period. The three beliefs were: "I have a brother called Ironman", "Jesus controls my behaviour", and "I studied law for 30 years and have a Masters degree".

The results reflected a rapid decrease in the degree of conviction as the treatment was applied, and the level fell to zero in all three beliefs. These values were maintained throughout the entire follow-up period.

An interesting result, and one that coincides with the work of Lowe and Chadwick (1990), was the generalisation of the treatment to three of the delusional beliefs

that were not objects of the intervention, with significant reductions in the degree of conviction, especially in those that were related in terms of content.

The measures applied by independent assessors confirmed the decrease in conviction with regard to the delusional beliefs, and the score obtained in the SAPS went from severe intensity of the delusional beliefs in the baseline period to moderate intensity after the treatment and in the follow-up.

The third study in which a between-behaviours multiple-baseline design was applied was that of Chadwick and Trower (1996). In it is described an adaptation of these techniques for the modification, in a patient with a schizoaffective disorder, of a type of paranoid delusion they call "punishment paranoia" (Trower and Chadwick, 1995; Chadwick and Trower, 1997). In contrast to the previous works, as measures of the dependent variable they used only the percentage of conviction in the delusional beliefs and the BDI.

These authors, through their empirical work, found that not all delusional beliefs of a paranoid nature are the same, and that two large groups can be differentiated: the first group is constituted by what they call "persecution paranoias", in which subjects believe that other people want to harm them or persecute them without justification; in the other group are what they call "punishment paranoias", in which subjects also believe they are the object of persecution, but in this case they believe such ill treatment to be deserved because they are intrinsically evil. (Trower and Chadwick, 1995; Chadwick and Trower, 1997). These authors consider this difference to be crucial, as it has very important practical implications for the design of the therapeutic strategy (for more information, see Chadwick, Birchwood and Trower, 1996).

According to the therapeutic strategy proposed, the authors directed their intervention towards the modification of the two delusional beliefs presented by this patient, and also towards the negative attitude with regard to himself as intrinsically evil and deserving of punishment. Thus, the intervention was organised in accordance with a multiple-baseline design aimed at the elimination of three beliefs: the first was the patient's view of himself as an evil person, the second was the delusional belief that people could read his mind and were planning to harm him, and the third was the idea that God wanted to punish him for having blasphemed.

While the degree of conviction of the first two beliefs was stable at practically 100% throughout the baseline

phase, the percentage of conviction of the third belief was quite unstable, varying between 90% (at the beginning of this phase) and 15% (at the end of this phase), coinciding with the application of the treatment to the other two beliefs. During the treatment phase there was observed a clear decrease in the degree of conviction in the first two beliefs coinciding with the application of the treatment; however, the effects became generalised to the third belief, leading to a fall in the baseline values, as referred to earlier. In the follow-up at three months the degree of conviction ranged between 0% and 20%, remaining practically the same as in the treatment phase.

## RESULTS OBTAINED IN THE PQ AND BDI

Up to now we have discussed the results obtained with the dependent variable degree of conviction. We shall now proceed to analyse, jointly for the subjects that participated in the three multiple-baseline studies of Chadwick and Lowe (Chadwick and Lowe, 1990; Lowe and Chadwick, 1990; Chadwick and cols., 1994), the results obtained with respect to the degree of preoccupation and level of anxiety they experienced in relation to their delusional beliefs. At the end of each session they were administered the PQ to obtain a retrospective assessment of these measures. When these assessments are compared with the results for degree of conviction, two clear patterns emerge:

- The first consists in that during the baseline phase the measures of preoccupation, anxiety and conviction vary independently, supporting the point of view that delusions are a multidimensional phenomenon (e.g., Strauss, 1969).
- The second pattern consists in that during the intervention phase, in the majority of subjects, the three measures tend to vary according to quite specific parameters of change for each of them. For example, of the 10 subjects in which the degree of conviction decreased during the treatment, in six a decrease in preoccupation and anxiety was observed. Nevertheless, in three cases, whilst the levels of conviction and anxiety decreased, the degree of preoccupation increased or remained at very high values. In one subject, preoccupation and anxiety decreased whilst the degree of conviction remained as it was.

These data are of great interest in that they corroborate that which is observed in everyday clinical work: clinical improvement in patients with delusions is quite complex, and can follow quite different patterns of change.

With regard to the accommodation test, no subjects

reported experiences that refuted their beliefs during the baseline phase. As in the study by Brett-Jones and cols. (1987), the results of the assessment of accommodation suggest that schizophrenic patients do not confront their own beliefs or put them to the test. However, and as is also affirmed in the above-mentioned study, this lack of validation of one's own beliefs is equally observed in non-psychiatric populations. In any case, in the majority of the subjects in whom there was observed a decrease in degree of conviction during the intervention phase, they provided at least one example that permitted the refutation of their own beliefs. According to Chadwick and Lowe (1994) these examples that serve to disprove beliefs may be of two types:

- 1) Memories of situations that had previously been considered in delusional terms, but are subsequently reinterpreted as disproof of the subject's delusions.
- 2) Memories of situations that were at no time interpreted in delusional terms, and are subsequently considered as disproof of the subject's delusions.

Thus, it would appear that simply on the basis of a decrease in the degree of conviction in delusional beliefs, as the product of a process of confrontation and questioning, the patient begins to consider them as hypotheses to be tested, rather than as absolute truths.

On the other hand, the assessment of the construct called *reaction to hypothetical contradiction* (RHC) produced interesting data that suggest this measure may help to predict the patient's response to treatment. In fact, eight of the twelve patients that responded on at least one occasion to the example of hypothetical contradiction—in the sense that it led them to question their delusional belief or to reject it completely—decreased their degree of conviction as a result of the intervention. Likewise, two of the four who claimed the example of hypothetical contradiction would not alter their degree of conviction did not modify their conviction level as a result of the treatment. From these results, Chadwick and Lowe (1994) concluded that some individuals are better prepared than others for questioning their delusions, and that this may be detected by measures such as RHC. In any case, this hypothesis must be tested and confirmed in future research.

Finally, as regards the application of Beck's Depression Inventory (BDI), in 9 of the 10 subjects in whom conviction level decreased during the treatment, the scores obtained in this inventory also fell significantly. This result contradicts the hypothesis that the weakening or elimination of a delusional belief has a

negative effect on the psychopathological state of the patient –an idea arising from the work of Zigler and Glick (1988), who claim that the delusions of paranoid schizophrenics may serve as a form of defence against depression. If this were the case, subjects would have scored low in the BDI during the baseline phase and increased their score during the treatment as degree of conviction fell –exactly the opposite of what was found in the studies described above. In general, these results support the findings of Milton and cols. (1978), who observed that a decrease in the strength of a delusion is related to a significant overall reduction of the psychiatric disorder.

## CONCLUSIONS

In the present work we have reviewed seven studies that used a methodology based on single-case or n=1 experimental designs (see Table 1). In total we have data from 21 people that were given cognitive-behavioural therapy as treatment for conditions involving delusional beliefs. Of these, 13 had been diagnosed as schizophrenic according to the DSM-III (9 subjects) and DSM-III-R (4 subjects), 2 as suffering from a schizoaffective disorder (1 according to the DSM-III and 1 according to the DSM-III-R), and 6 as having a delusional disorder according to the DSM-III-R. Reductions in the degree of conviction in their beliefs were obtained in 10 schizophrenic subjects (77%), 2 schizoaffective subjects (100%) and 3 subjects with delusional disorders (50%).

As it can be appreciated, techniques for modifying beliefs succeed in weakening, or in some cases eliminating, the delusions of patients with diagnoses within the spectrum of psychosis. Nevertheless, there are differences with regard to the effectiveness of the treatment depending on the diagnoses. Subjects diagnosed as schizophrenic and schizoaffective obtain the best results, while those for subjects with delusional disorders are more modest. Sharp and cols. (1996) attribute these differences to the fact that in subjects with this type of disorder their delusions play a very important role in maintaining their psychological integrity, so that the patient clings more strongly to his or her pathological beliefs, whilst in schizophrenics and schizoaffectives there are other types of psychotic symptoms that predominate and maintain this psychological integrity.

Clearly, these results are not conclusive, and it may be necessary to replicate them with larger samples. However, with these designs, and especially with those of multiple baseline, it has been demonstrated in a high percentage of cases that the sequential administration of the treatments has produced significant modifications in beliefs of a delusional nature. The most relevant component of these interventions appears to be that of verbal dispute, with the reality test being an effective component as long as it is preceded by the former.

Another interesting aspect, and one which opens up an important field of research, is the confirmation that the delusional belief is a multidimensional variable, which

**Table 1**  
**Results obtained with Cognitive-Behavioural Therapy applied to**  
**the delusional beliefs of psychotic patients using single-case experimental designs**

Studies	Design	N	Diagnosis	Follow-up	Results
ALFORD, 1986	ABAB	1	Schizophrenia	3 months	Significant reduction in frequency and conviction level of delusional beliefs. Improvement partially maintained in follow-up .
CHADWICK & LOWE, 1990	Between-subjects multiple-BL	6	Schizophrenia	1, 3 and 6 months	Significant reduction in conviction level in 5 out of 6 subjects. Results maintained in follow-up .
LOWE & CHADWICK, 1990	Between-behaviours multiple-BL	2	Schizophrenia	1, 3 and 6 months	Conviction level of 0% attained for all delusional beliefs in both subjects. Results maintained in follow-up .
HIMADI & KAISER, 1992	Between-behaviours multiple-BL	1	Schizophrenia	1, 2, 4 and 6 months	Reduction in conviction level to 0% in the 3 target beliefs. Generalisation of effects of the intervention to non-treated beliefs. Results maintained in follow-up .
CHADWICK & COLS., 1994	Between-subjects multiple-BL	4	3 Schizophrenics 1 Schizoaffective	1, 3 and 6 months	Reduction in conviction level to 0% in 3 out of 4 subjects. Slight increase in conviction level in these 3 subjects in follow-up, though never exceeding 50% conviction
CHADWICK & TROWER, 1996	Between-behaviours multiple-BL	1	Schizoaffective disorder	3 months	Significant reduction in conviction level in 2 of the subject's 3 delusional beliefs with application of the treatment. Effects generalised to the third belief. Conviction level attained at end of treatment maintained in follow-up .
SHARP & COLS., 1996	Between-subjects multiple-BL	6	Delusional disorder	No follow-up	Modest reduction in conviction level in 3 out of 6 subjects .



must therefore be assessed in accordance with all the dimensions that most accurately describe it. As observed in everyday clinical practice, in these works it has been seen how psychological treatment affects these dimensions in differential ways, creating quite specific patterns of change in each subject. However, we are as yet unaware as to which treatment variables, or other, unknown variables determine such patterns. Of prime importance is the development of instruments that permit reliable measurement of the dimensions constituting delusional beliefs.

Also, these studies allow us to consider which variables may predict the results of the therapeutic intervention. Chadwick and Lowe (1994) state that Reaction to Hypothetical Contradiction may be a good predictor of the results of treatment. This was already proposed by Brett-Jones and cols. (1987) as a measure of potential acceptance by subjects of the tests that contradict their beliefs. In these works it has been observed that in all subjects that responded positively to RHC there was a decrease in the degree of conviction in their beliefs, while half of the subjects claiming their beliefs to be unaffected by RHC did not reduce their percentage of conviction in them.

In the analysis of Sharp's data we observed that in the case of patients with delusional disorders that reduced the degree of conviction in their beliefs, the baselines showed greater variability in conviction levels than those of subjects that presented no modifications in their beliefs. This fact leads us to speculate that such variability may constitute a predictive measure of the results of the intervention valid only for subjects with delusional disorders, and not for schizophrenic or schizoaffective patients. In any case, this hypothesis should be checked empirically in future research.

Among the most significant problems found in relation to these studies are the following:

1. Only the effectiveness of the treatment in relation to variables associated with delusions has been studied –its effect on patients' general functioning and negative symptoms is unknown. Likewise, we have no information as to whether this type of therapy is superior to other types of psychological intervention or routine care (treatments based solely on the medication and follow-up in the community).
2. None of the follow-up periods in these studies lasted beyond six months, so that we have no information on the durability of the effects of treatment in the medium or long term. The provision of such information should be a requirement of future research.

3. An important limitation of single-case experimental designs is that their data are normally analysed by means of the visual inspection of the baseline graphs. According to some authors (Matyas and Greenwood, 1990), this form of data analysis is not reliable. Bouchard, Vallières, Roy and Maziade (1996) applied a statistical technique of time series analysis to the data provided by Chadwick and Lowe (1990) for one of their subjects. While visual inspection of the preoccupation variable in this subject's delusions suggested that it had decreased, this change was shown by time series analysis to be non-significant.

Despite these limitations, the application of cognitive and behavioural treatments to delusional beliefs, and to other psychotic symptoms, such as auditory hallucinations (for a review, see Perona Garcelán & Cuevas Yust, 1996), is making considerable progress. We can therefore conclude that, although the road ahead is long, a line of study and research has been opened up that offers the hope, in the short to medium term, of being able to perfect our therapeutic techniques and relieve the pain and suffering of many people.

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