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PSYCHOLOGICAL TREATMENT OF HEADACHE: VARIABLES THAT PREDICT IMPROVEMENT IN AN ACTIVE-PASSIVE APPROACH

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The objective of this study was to identify the variables involved in the therapeutic effectiveness of the psychological treatment of headache. Two main factors were studied: active and passive patient collaboration in the treatment. Twenty-one headache patients were assigned to two groups. The first group received the P-A treatment sequence; the second received the A-P sequence. The variables evaluated were: physiological responses, expectancies for the psychophysiological evaluation, locus of control, suggestibility, type A behaviour pattern, depression, associations between specific situations and changes in pain, improvement, age, chronicity of pain and education. Multiple regression analyses were used to identify the variables that explained clinical improvement in each treatment approach. The study showed the utility of predicting the effectiveness of a conventional psychological treatment (Active) and a less conventional one (Passive) for maximizing clinical effects.

Este trabajo pretende estudiar las variables que pudieran predecir la eficacia de dos acercamientos distintos al tratamiento psicológico de las cefaleas primarias: en uno se potencia la implicación activa del paciente y su implicación pasiva en el otro. 21 pacientes de cefalea fueron asignados a 2 grupos. El primer grupo recibió la secuencia de tratamiento Pasivo-Activo y el segundo la secuencia Activo-Pasivo. Se evaluaron distintas variables: respuestas fisiológicas, expectativas ante la evaluación psicofisiológica, locus de control, sugestibilidad, patrón de conducta tipo-A, depresión, asociaciones entre situaciones concretas y cambios en el dolor, mejoría clínica, edad, cronicidad y nivel de estudios. Los análisis de regresión múltiple señalaron el conjunto de variables que mejor predecían la mejoría clínica para cada modalidad de tratamiento. La utilidad clínica del trabajo estriba en la posibilidad de predecir la eficacia de un tratamiento psicológico convencional (Activo) y de otro menos convencional (Pasivo), para potenciar los efectos clínicos del tratamiento.

The treatment of chronic pain continues to constitute a clinical and theoretical challenge. Despite the effectiveness of the treatments currently used, especially in the case of chronic benign pain, there is no corresponding theoretical-empirical knowledge of the reasons for such effectiveness. Various reasons have been adduced for the lack of such knowledge, but the truth is that the increase in our understanding of the complexity of pain has not been matched by the development and control of treatments.

Some authors, such as Turk and Rudy (1992), stress a maxim common to other clinical fields: the need to consider personal and environmental variables of the patient as determining elements in designing treatment programmes and explaining their efficacy. Together with the study of personal variables, there is another area of interest in attempts to rectify our knowledge deficit in this field, that of the placebo effect: a proportion of the changes observed in pain treatments is due to the action of this type of effect, which occurs in medical, surgical and psychological treatments. Despite the fact that such effects appear to be strongly psychological in nature (with cognitive variables being especially important), it has not been possible either to reproduce or to control them from strictly psychological processes, perhaps because they operate differently in psychological and medical treatments.

This study sets out from the knowledge of the existence of therapeutic procedures that are relatively effective in the psychological treatment of pain, and from the ignorance of how such treatments work. Therefore, and bearing in mind the difficulty of establishing a causal relationship between the multiple variables involved in

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pain and its treatment, we adopt a correlational and exploratory strategy aimed at identifying the variables that may explain treatment effectiveness. With this aim, we employ a therapeutic strategy that may help to identify the least well known variables. In this sense, the patient's involvement in the treatment may prove useful. The study of a passive treatment (the patient is not involved, nor takes responsibility) and an active treatment (the patient accepts the problem as his/her own and acquires strategies for dealing with it) may reproduce, to some extent, the basic characteristics of medical treatment and of psychological treatment (Comeche and cols., 1997).

Of the different variables of interest in the prediction of pain treatment effectiveness, the most noteworthy are those likely to throw most light on the deficits described above: locus of control (e.g., Arntz and Schmidt, 1989), emotional reactivity to stressful situations (e.g., Rappaport and cols., 1988), physiological reactivity (e.g., Flor and Turk, 1989), mood (e.g., Rudy and cols., 1988), degree of suggestibility (e.g., Spinhoven, 1988) and patient's expectancies about the therapeutic intervention (e.g., Jensen and cols., 1991). To all of the above we should add the need to check the extent to which the patient perceives an association between behavioural, cognitive and emotional factors and changes in the perception of pain, which is of special importance if we are to objectivize what has generally been accepted as an unquestionable fact.

The objective of this study is to explore some psychological, social and psychophysiological variables with regard to their capacity for predicting the degree of effectiveness of a psychological treatment for chronic pain, in this case for primary headaches. This treatment has been specifically designed for studying the dimension "active vs. passive involvement of the patient" in the treatment.

METHOD

Subjects

Twenty-one primary headache patients distributed in two groups, as shown in Table 1. This table shows only the demographic details relevant to this work; the rest of the sample characteristics can be found elsewhere (Comeche and cols., 1997).

Variables measured

During the initial session all subjects carried out tests and responded to questionnaires, as follows:

- Psychophysiological assessment: Profile of stress related to pain. This is a computerized battery made up of 20 situations supposedly related to pain, and which the subject is required to personalize and briefly imagine. During the test, and by means of a computerized system of registration and processing of psychophysiological responses (J&J I-330) connected to a PC, we recorded the following physiological responses: frontal electromyographical activity (EMG1) and electromyographical activity in the muscles of the trapezius (EMG2); respiratory rate (RR); heart rate (HR); blood pulse volume (BPV); peripheral temperature (TEMP); and skin conductance (CON).
- Expectancies about the psychophysiological assessment: questionnaire on expectancies related to this test, based on the scale developed by Borkovec and Nau (1972). Subjects were required to respond on a scale of 0-10 to the following items: REALISM (degree of realism in imagining the situations), EQUIPMENT (rating of the use of computer equipment in the diagnosis), SUITABILITY (suitability of the test for their problem), LOGIC (rating of the logic of the test), CONTRIBUTION (contribution of the test to the solution of the problem), KNOWLEDGE (contribution of the test to knowledge of the problem), SOLUTION (current confidence in solution of the problem), RECOMMENDATION (intention to recommend the test to relatives or friends with similar problems), ACCESSIBILITY (rating of the accessibility of the test), UNIVERSITY (opinion

Table 1

Subject characteristics in each group. Age, chronicity in years and educational level: 1 = primary, 2 = secondary, 3 = further, 4 = higher ($\overline{X}$: mean and s.d.: standard deviation). N: number of patients (men/women). Group I: Passive-Active. Group II: Active-Passive. F(p): comparison of differences between groups (n.s.: F value non-significant for p<0.05).

Subject characteristics	Group I	Group II	F(p)
AGE: $\overline{X}$ (s.d.)	41.6 (10.47)	42.0 (17.64)	n.s.
CHRONICITY: $\overline{X}$ (s.d.)	12.2 (11.07)	15.3 (14.70)	n.s.
EDUCATION: $\overline{X}$ (s.d.)	1.7 (1.01)	1.7 (0.82)	n.s.
N (men/women)	11 (8/3)	10 (7/3)	n.s.

on whether the tests should be carried out in the university).

- Locus of control related to health: measured by means of form A of the "Multidimensional Health Locus of Control" (MHLC) (Wallston and cols., 1978). Measures were obtained of its three dimensions: INTERNALITY, POWER of OTHERS and LUCK.
- Degree of suggestibility: measured by means of the FALLING-BACKWARDS test of hypnotic suggestibility, first item of forms A and B of the Stanford scale (Weitzenhoffer and Hilgard, 1959). This test was applied three times to each subject, so that the score could range from 0 to 3, depending on the number of times the subject reacted to the suggestions of falling.
- Type A Behaviour Pattern (TABP): measured using the Jenkins Activity Scale (JAS) (Jenkins and cols., 1979), form C, Spanish version by Fernández-Abascal (1992). We obtained, in addition to the TYPE-A measure itself, those of each of its three components: IMPATIENCE, WORK and COMPETITIVENESS.
- Depression: measured with Beck's Depression Inventory (BDI) (Beck and cols., 1961), Spanish version by Conde and Useros (1975).

Apart from the variables recorded in this initial session, the following measures were also taken into account:

- ASSOCIATIONS in the baseline: percentage of occasions on which subjects associated concrete situations with the onset of a headache episode. This measure was obtained from the self-records made during the baseline month.
- Percentage of IMPROVEMENT: degree of reduction of the headache index during each post-treatment period with respect to the baseline. Headache index (frequency x duration x intensity) was obtained from the daily pain self-records.

PROCEDURE

The outline of the procedure is shown in Table 2. The procedure followed in each one of the treatment phases was described in detail in Comeche and cols., (1997). Since the objective of this work was to identify the factors that could help us to predict the improvement observed after the intervention, the majority of the data relevant to this objective were to be obtained in the initial assessment session or during the baseline phase, and obviously in each of the post-treatment periods. Therefore, in this work we shall present only the data relevant to these three periods and the tests carried out in them (in bold in Table 2).

The initial session began with an individual interview in which personal data were recorded, together with information related to type of headache, chronicity, evolution and current state of the problem. Subsequently, each subject was given the battery of tests and questionnaires described. Finally, subjects were instructed so that they could self-observe their pain (frequency, intensity and duration), as well as the situations they associated spontaneously with the onset of each episode, and record this data in their daily self-records. Once subjects had given their consent for their data to be used in a study on the assessment and treatment of headache, they were given an appointment approximately one month later.

As it can be seen in the procedure outline, it is in the two treatment phases (TT1 and TT2) that the differences marked by the experimental design are introduced. In the first phase (TT1), the Group I subjects received the passive treatment, which consisted in 12 sessions of bio-

Table 2

Procedure outline. Phases in bold indicate the points of the intervention at which relevant data were collected. TT1 = first treatment period; PT1 = first post-treatment; TT2 = second treatment; PT2 = second post-treatment; MHLC = Multidimensional Health Locus of Control; JAS = Jenkins Activity Survey; BDI = Beck's Depression Inventory

Initial Assessment	**Baseline**	TT1	**PT1**	TT2	**PT2**
- Interview **- Psychophysiological Assessment** **- Expectancies about psychophysiological assessment** **- MHLC** **- Suggestibility** **- JAS** **- BDI**	**Self-record:** **Associations during baseline**	I - PASSIVE Biofeedback sessions II – ACTIVE Behavioural therapy sessions	**Self-record:** **% improvement from baseline to PT1**	I – ACTIVE Behavioural therapy sessions II - PASSIVE Biofeedback sessions	**Self-record:** **% improvement from baseline to PT2**

feedback, during which subjects received only instructions of passivity, making them see that the success of the treatment depended exclusively on the equipment itself, and not on their activity. With this type of treatment it was attempted to strengthen the possible unknown therapeutic effect, linked to medical interventions, focused basically on the external nature of the curative agent. In a parallel way, the Group II subjects received in this first treatment phase six conventional sessions of Behavioural Therapy, a treatment qualified as Active, since at all times it was attempted to encourage the active involvement of patients in their own therapeutic process. In the second phase of treatment (TT2) each group of subjects was administered the complementary treatment (Active in Group I and Passive in Group II), so that

Table 3

Percentage improvement in each post-treatment period. Comparison of groups: Group I = Passive + Active, Group II = Active + Passive. PT1 = first post-treatment, PT2 = second post-treatment. s.d.: standard deviation. F(p): comparison of differences between groups (n.s.: F value non-significant for p<0.05)

	Group I Mean (s.d.)	Group II Mean (s.d.)	F(p)
Phase	Passive	Active	
% improvement in PT1	27.8 (36.83)	57.5 (38.31)	n.s.
Phase	Active	Passive	
% improvement in PT1	50.2 (35.89)	68.9 (36.05)	n.s.

Table 4

Means, standard deviations and group differences in each of the variables measured in the initial assessment. Group I= Passive-Active; Group II=Active-Passive; s.d.= standard deviation; EMG1= frontal electromyographical activity; EMG2= electromyographical activity in the trapezia; RR= respiratory rate; HR= heart rate; TEMP=peripheral temperature; BPV=blood pulse volume; CON= skin conductance; MHLC= Multidimensional Health Locus of Control; JAS=Jenkins Activity Survey; TYPE-A=Type A Behaviour Pattern; BDI=Beck's Depression Inventory; F=comparison of differences between groups (n.s.: F value non-significant for p<0.05); p=probability of statistical significance of F.

Test or questionnaire	Variable or dimension	Group I Mean (s.d.)	Group II Mean (s.d.)	F	p
Psychophysiological Assessment	EMG1	6.60 (3.86)	5.36 (1.62)	n.s.	
	EMG2	2.83 (0.90)	2.82 (1.01)	n.s.	
	RR	17.01 (4.09)	17.34 (2.58)	n.s.	
	HR	74.99 (12.99)	64.53 (8.02)	4.81	0.041
	TEMP	30.88 (4.64)	30.85 (3.61)	n.s.	
	BPV	14.25 (11.03)	9.71 (5.71)	n.s.	
	CON	6.37 (2.80)	6.93 (4.51)	n.s.	
Expectancies about psychophysiological assessment	REALISM	7.00 (3.10)	6.40 (2.37)	n.s.	
	EQUIPMENT	9.64 (0.67)	8.10 (1.91)	6.27	0.021
	SUITABILITY	8.73 (1.27)	8.00 (1.63)	n.s.	
	LOGIC	8.55 (1.04)	8.00 (1.74)	n.s.	
	CONTRIBUTION	8.00 (1.73)	7.90 (1.63)	n.s.	
	KNOWLEDGE	7.55 (2.34)	7.50 (2.27)	n.s.	
	SOLUTION	7.36 (2.29)	6.60 (2.67)	n.s.	
	RECOMMENDATION	9.00 (1.67)	8.10 (2.28)	n.s.	
	ACCESSIBILITY	9.73 (0.65)	9.90 (0.32)	n.s.	
	UNIVERSITY	9.00 (1.48)	9.40 (1.07)	n.s.	
MHLC	INTERNALITY	20.91 (7.60)	27.40 (4.09)	5.76	0.027
	POWER of OTHERS	19.82 (6.65)	22.50 (9.85)	n.s.	
	LUCK	19.91 (8.92)	14.20 (8.83)	n.s.	
Falling-backwards	SUGGESTIBILITY	1.28 (1.27)	2.30 (1.06)	n.s.	
JAS	TYPE-A	-3.52 (13.87)	0.56 (12.69)	n.s.	
	IMPATIENCE	2.23 (15.13)	3.58 (14.65)	n.s.	
	WORK	-10.83 (8.11)	-3.79 (11.53)	n.s.	
	COMPETITIVENESS	8.56 (11.54)	11.20 (12.21)	n.s.	
BDI		8.73 (6.23)	16.50 (8.41)	5.87	0.026
Associations in baseline		7.67 (11.96)	25.43 (22.95)	5.09	0.036

both groups received alternately and sequentially both types of treatment.

The final piece of data relevant to this study, the percentage of IMPROVEMENT after each phase of treatment, was obtained during the post-treatment periods (PT1 and PT2), both lasting one month. Subjects were required to continue filling in their daily self-record of headaches, with the aim of being able to establish the improvement with respect to the baseline.

RESULTS

Percentages of improvement in each post-treatment

Percentages of improvement in each phase of post-treatment, by group, are shown in Table 3. As it can be seen, the results of the Variance Analysis (ONEWAY) used for comparing group differences in each post-treatment indicate non-significant differences in these periods.

Variables measured in the initial assessment and baseline

The data obtained by means of the tests and questionnaires applied in the initial session, and those deriving from the self-record during the baseline phase, were analysed at a descriptive level in order to discover the characteristics of the sample and compare differences between groups. Table 4 shows the results of each one of the tests carried out.

As it can be seen, groups were equal in almost all of the variables measured. Only in the case of the variables HR, INTERNALITY, EQUIPMENT, ASSOCIATIONS and BDI did significant differences appear between the two groups. These differences could not be rectified a priori, since subjects were assigned to one group or the other according to their demographic and diagnostic characteristics, and the group characteristics with respect to this set of variables were only studied a posteriori.

Multiple regression analysis

With all the data of the initial assessment and the baseline, we carried out a series of analyses aimed at identifying the relationships between these variables and the percentages of improvement presented by each subject in the post-treatment periods. None of the individual correlations between each of the variables and the improvement were found to be statistically significant, and we therefore proceeded to a multivariate study of

Table 5
Variables in each of the regression equations, for predicting improvement in the two post-treatment periods, for each group. PT: treatment period. R. Adjust. = Adjusted R^2.

Group	Period	Variable	B	SE B	Beta	T	Sig. T	R^2	R. Adjust.
I	PT1 (Passive)	AGE	2.736	0.525	0.778	5.209	0.006		
		EDUCATION	-19.807	6.095	-0.602	-3.250	0.031		
		EMG1	-20.822	7.264	-0.509	-2.866	0.046		
		FALLING-BACKWARDS	14.373	5.159	0.496	2.786	0.049	0.926	0.815
		ASSOCIATIONS	1.043	0.438	0.339	2.382	0.076		
		IMPATIENCE	-0.919	0.408	-0.378	-2.251	0.088		
	PT2 (Passive + Active)	EDUCATION	-27.854	8.488	-0.869	-3.282	0.013		
		EMG2	-29.101	10.937	-0.730	-2.661	0.032	0.652	0.503
		SUITABILITY	-12.586	6.615	-0.446	-1.903	0.099		
II	PT1 (Active)	REALISM	11.253	3.283	0.695	3.428	0.014		
		POWER of OTHERS	-2.588	0.933	-0.665	-2.774	0.032	0.758	0.637
		KNOWLEDGE	10.244	4.015	0.608	2.552	0.043		
	PT2 (Active + Passive)	EMG1	9.118	0.059	0.409	153.948	0.004		
		IMPROVEMENT IN PT1	0.428	0.003	0.455	144.637	0.004		
		CHRONICITY	-1.285	0.009	-0.524	-143.120	0.004		
		BDI	-1.505	0.012	-0.351	-126.153	0.005		
		RECOMMEN-DATION	4.711	0.046	0.298	102.734	0.006	1.000	0.999
		EMG2	-5.076	0.086	-0.143	-59.166	0.011		
		ASSOCIATIONS	-0.166	0.006	-0.106	-29.427	0.022		
		INTERNALITY	-0.380	0.024	-0.043	-15.734	0.040		

these relationships. Since the objective of our work was to identify the variables that were useful in predicting the effectiveness of each of the treatments, we used multiple regression techniques with the two sets of variables.

Using percentage of improvement for each post-treatment period as criterion variable and the remaining variables as predictor variables, we calculated the significant regression equations for each period and group, as shown in Table 5.

DISCUSSION

Prediction of effectiveness of Passive treatment (PT1-GROUP I)

From the first regression equation it can be deduced that those subjects for whom the Passive phase was most successful (improvement in PT1) were those who, on the whole, presented greatest AGE, lowest level of EDUCATION, lowest muscular tension in the trapezia (EMG2), highest suggestibility as measured by the FALLING-BACKWARDS test, made the highest number of ASSOCIATIONS and scored lowest in the IMPATIENCE factor of the JAS. In view of this set of variables, and always bearing in mind that the particular involvement of none of them can be considered without taking into account the whole set, we can make some remarks that illustrate each of the relationships found:

1) The greater the AGE of subjects, the greater the improvement with the Passive treatment. This prediction contrasts with numerous studies in which it is reported that young subjects tend to respond to psychological headache treatments better than older subjects (e.g., Werder and cols., 1981; Chapman, 1986). This contradiction may be explained by the peculiarities of the Passive approach that most differentiate it from conventional treatments. For example, while in normal psychological treatments (those that could be considered within the framework of the Active approach) it is necessary to take precautions with older subjects in order to compensate for certain deficits (Arena and cols., 1988 and 1991), in this work the very characteristics of the Passive treatment appeared to make such precautions unnecessary. In sum, it seems reasonable to state that the Passive treatment, on not requiring the learning or use of any type of ability, is a suitable approach for older headache patients.
2) The lower the EDUCATIONAL level, the better the response to the Passive treatment. Level of education, though a classic variable in the study of therapeutic processes (Shoham-Salomon and Hannah, 1991), does not tend to be useful in the prediction of the effectiveness of psychological treatment of headache (Werder and cols., 1981). The negative relationship between educational level and effectiveness of the Passive treatment obtained in this study may be the result of secondary suggestibility (Eysenck and Furneaux, 1945), a variable positively related to ingenuousness and credulity (Eysenck, 1989). Nevertheless, the finding of this relationship does not appear to be consistent with other results, as we shall see on discussing the next variable.
3) The greater the suggestibility (FALLING-BACKWARDS), the better the response to the Passive treatment. Suggestibility, as measured with the FALLING-BACKWARDS test, would respond to characteristics of primary suggestibility (Eysenck and Furneaux, 1945), a variable strongly correlated with hypnotizability (Eysenck, 1989). The results of this study support the positive relationship observed between primary suggestibility (hypnotizability) and improvement after the psychological treatment of chronic pain (Spinhoven, 1988). Nevertheless, it should be pointed out that the relationship between primary suggestibility and the improvement found with a placebo treatment (an effect of no little importance in the case of Passive treatment) is not usually significant (Evans, 1989). Also, the fact that primary suggestibility and low educational level act jointly to predict effectiveness of the Passive treatment appears to be incongruent with previous results, since a lack of relationship between primary and secondary suggestibility is usually reported (Eysenck, 1989). In view of the above, it would seem contradictory to consider secondary suggestibility as a mediator between low educational level and improvement.
4) Low level of muscular tension in the trapezia (EMG2) as a predictor of improvement with Passive treatment. Although the relationship between muscular tension and headache is quite complex, the literature reviewed provides no data that can help to illustrate this result.
5) The lower the score in IMPATIENCE, the greater the improvement after Passive treatment. This relationship would appear to indicate the greater effectiveness of the Passive treatment in people that are not particularly irritable, and who do not tend to

behave in an impatient manner or put pressure on others (Fernández-Abascal, 1994). Although some studies point to a positive relationship between headache and global TABP score (Rappaport and cols., 1988), there are no data with respect to the relationship between headache and each of the components of the JAS, nor on the relationship between these components and improvement subsequent to intervention. Our own results, though referring to only one component of the pattern, are in contrast to those reported in the review by Chapman (1986), who suggests that the presence of high scores in TABP is a good predictor of the effectiveness of treatments such as biofeedback or relaxation. Taking all of this into account, we can speculate that the involvement of the variable IMPATIENCE in the improvement obtained with the Passive treatment may be attributable to those people that, on not presenting characteristics typical of impatient people, do not "need" an active intervention that modulates their behaviour style.

6) The greater the number of ASSOCIATIONS in the baseline, the greater the improvement. This relationship is somewhat paradoxical. Capacity to observe relationships between pain and triggering situations would appear to provide a good prediction for the success of an approach such as the Active one, which is based on the modification of such relationships. Consequently, its involvement in the success of the Passive phase is not coherent with the logic of this type of treatment, which appears to lie more in the measurement of non-specific cognitive variables than in the subject's ability for self-observation. An aspect that could be related to the intervention of self-observation ability in the improvement achieved in the Passive phase may be precisely a paradoxical effect, such as that postulated by some authors (Arntz and Schmidt, 1989; Vallejo and Comeche, 1994): the Passive treatment, on focusing the responsibility for control on an external source, would turn out to be beneficial for the patients with the greatest capacity for self-observation.

Prediction of improvement on adding the Active phase in GROUP I

The second regression equation shows us that the profile of subjects that present most improvement after the Active treatment phase in this sequence (Passive + Active) is that of people with low EDUCATIONAL level and low level of tension in the trapezia (EMG2), and who considered the computerized test in the initial assessment as least SUITABLE for their problem. The following remarks are aimed at illustrating the relationships found:

1 & 2) The lower the EDUCATIONAL level and level of muscular tension in the trapezia (EMG2), the better the response to Active treatment in PT2. These two variables already formed part of the regression equation obtained for predicting improvement in PT1. Their involvement, though difficult to explain (as already pointed out), appears to constitute a continuation of the effect found in the first treatment phase.

3) Considering the initial test of psychophysiological assessment as not very SUITABLE for the subjects' problem is a good predictor of improvement in the Active phase of PT2. This relationship is congruent with the characteristics of the Active phase. It appears to denote an attitude of rejection of machines, and consequently a better response to the Active treatment received in this second phase. That is, subjects that considered the initial computerized test as fairly unsuitable improved with an Active treatment, perhaps because they found it radically different from the test of which they disapproved.

Prediction of effectiveness of Active treatment (PT1-GROUP II)

According to the third regression equation, subjects that showed more improvement after the Active phase, applied in first place, were people who, on the whole, imagined the situations described in the psychophysiological assessment with greater REALISM, scored low in the MHLC externality factor POWER of OTHERS, and had high expectancies that the psychophysiological assessment would be able to help them to KNOW their problem better. The following remarks can be made on the different relationships found:

1) The greater the REALISM on imagining the situations described in the initial psychophysiological assessment, the better the response to the Active treatment. This relationship would appear, in principle, more congruent with the characteristics of the Passive treatment than with those of the Active phase. Indeed, the involvement of imagination as a personality trait has frequently been positively correlated with hypnotic responsiveness (Kirsch, 1990). However, the fact that in this group of subjects there is observed a negative and significant

correlation between the variables REALISM and FALLING-BACKWARDS would indicate that subjects who imagined the situations with the greatest degree of realism were in turn the least suggestible, so that it does not seem reasonable to interpret the prediction of the variable REALISM in the sense of hypnotizability. It would appear more coherent to deduce that the greater degree of REALISM is a reflection of a voluntary process, of wishing to fulfil the therapeutic prescription, since this behavioural style is ideally productive for an approach like the Active one, in which the permanent and active collaboration of the subject is necessary throughout the therapeutic process.

2) Low score in the externality factor POWER of OTHERS as a good predictor of improvement with the Active treatment. This relationship is coherent with the demands of this approach. Given that subjects do not focus their own expectancies of cure on factors external to themselves, it appears logical that they tend to become more involved in their own therapeutic process, and consequently obtain better results with an Active approach. If we consider this result in relation to the literature on the subject, it is easy to find data on the positive intervention of internality (Hudzinski and Levenson, 1985; Härkäpää, 1991), but not on the negative relationship between externality and improvement. However, discrepant results also appear, such as the lack of utility of locus of control as a predictor of headache severity (Jones and Page, 1986), or as a predictor of the efficacy of real or placebo feedback (Díaz and Vallejo, 1987), and, contrary to expectations (Gale and Funch, 1984), the beneficial effects of POWER of OTHERS in the effectiveness of Behavioural Therapy. In sum, although the relationship between POWER of OTHERS and improvement has not so far found direct support in the literature, the involvement of this variable in the effectiveness of Active treatment appears to be coherent with the peculiarities of that treatment.

3) The higher the level of expectancies of KNOWLEDGE of the problem through the Psychophysiological Assessment, the greater the improvement with the Active treatment. This relationship appears to be congruent, since the content of the questions asked during the assessment covered a set of aspects potentially related to pain (stress-generating situations, typical thoughts in these patients, activities that relieve pain, etc.) –aspects usually considered as related to the onset, worsening or relief of headache (Drummond, 1985).

Prediction of improvement on adding the Passive phase in GROUP II

According to this final regression equation, the subjects that achieved most improvement on adding the Passive treatment in this sequence (Active + Passive) were those that, on the whole: presented a higher level of response in the frontal muscles (EMG1) during the initial Psychophysiological Assessment, together with a lower level in the trapezia (EMG2); rated as strong their intention to RECOMMEND the test; achieved more IMPROVEMENT with the Active treatment during the PT1; and presented lower CHRONICITY, lower scores in the BDI, a smaller percentage of ASSOCIATIONS in the baseline and a lower level of INTERNALITY. The following comments aim to illustrate each of the relationships found:

1) The greater the IMPROVEMENT in PT1, the greater the improvement after the Passive phase in PT2. This relationship appears to indicate that the completion of the entire sequence produces an optimization of the results obtained in the first part of that sequence. In this case it would indicate, specifically, that the improvement experienced after the Active treatment phase is consolidated and strengthened with the carrying out of the Passive phase.

2) A high level of frontal muscular tension (EMG1) during the Psychophysiological Assessment as a predictor of the effectiveness of the Passive treatment in the PT2. This result is congruent with the findings of Cram (1980), who found that tension headache patients with high levels of EMG in the initial assessment (moderately stressful cognitive task) presented a greater improvement in a treatment programme with biofeedback and relaxation. However, this result, in turn, contradicts the findings of Blanchard and cols. (1983), who reported less improvement after biofeedback training in subjects with higher basal levels of EMG.

3) The greater the level of EMG2 tension, the greater the improvement after the Passive treatment in PT2. This relationship also appeared in the prediction of the efficacy of the two types of treatment in the Group I subjects; as already pointed out, there are no data in the literature reviewed that could help us illustrate the relationship between these variables.

4) High score in the variable RECOMMENDATION as a good predictor of improvement after the Passive treatment in PT2. This relationship appears to be coherent with that postulated by Kirsch's team (Kirsch, 1985; Kirsch and Council, 1989) on the positive relationship between expectancies and pain reduction, though it is essential to qualify this assertion: first, Kirsch speaks of correlation, while in our case the relationship between the two variables is found by means of a multiple regression analysis; second, Kirsch's hypothesis is established with regard to the relationship between direct expectancies of pain reduction and actual reduction. The intention to RECOMMEND a treatment would appear to be closer to an indirect measure of such expectancy, even more so considering that the questionnaire included items dealing directly with the expectancies, and which were not found to be related to improvement.
5) The lower the CHRONICITY level, the greater the improvement with the Passive treatment in PT2. Although the chronicity variable is a classic one in this type of study, it does not tend to be a good predictor of treatment effectiveness (Werder and cols., 1981). Nevertheless, the result of our work seems logical from theoretical positions such as that of Bakal and Kaganov (1977), in their psychobiological model based on chronicity. In this model, severity of pain is made to depend on degree of chronicity, and although the relationship between severity and chronicity does not necessarily involve improvement after treatment, it appears logical that the treatment of less chronic, and therefore less severe, headaches is more accessible. Some authors (Nicholson and Blanchard, 1993), reporting recent results in this line, refer to a strong negative correlation between chronicity (in years) and improvement after treatment. Bearing in mind the caution that should be exercised on comparing these data from correlational analyses with data from multiple regression analysis, they would nevertheless appear to concur with the findings of the present study.
6) The lower the BDI score, the greater the improvement with the Passive treatment in PT2. Score in the BDI has been considered a good predictor of the effectiveness of behavioural treatment of headache in some research (e.g., Jacob and cols., 1983). These studies coincide in pointing out that the majority of patients that showed improvement had scores of less than 8. Despite the fact that in our study the majority of subjects in Group II scored above this cut-off point (mean 16.5; range 4-29), the relationship found is nevertheless congruent with the findings of these authors.
7) The lower the level of INTERNALITY, the greater the improvement with the Passive treatment in PT2. This relationship would appear to be congruent with the logic of this type of treatment. That is, subjects who do not perceive that their pain problem depends on their own actions improve more with the Passive treatment since, clearly, it is coherent with their beliefs.
8) A low percentage of ASSOCIATIONS as a good predictor of improvement after Passive treatment in PT2. This relationship contrasts with the involvement of this same variable when the Passive phase was received in first position, that is, in Group I. The obvious differences involved in receiving the Passive treatment in an isolated way or subsequent to the Active treatment may explain this distinction. As pointed out earlier, the involvement of a high percentage of associations in improvement after the Passive phase can most plausibly be interpreted by relating, on the one hand, the fact of not having to use any control strategy in this type of treatment with, on the other, the benefits of such behaviour for those subjects most preoccupied with their self-observation. Nevertheless, when the Passive treatment is applied at the end of the sequence, that is, after the Active treatment, the prediction changes its sign, as in this case the patients that benefit most are those that initially presented low levels of association. It would appear, then, that these subjects benefit most from the Passive treatment only when they have first received the Active treatment, in which they have evidently learned to associate certain situations with the onset or worsening of their pain.

CONCLUSIONS

To recapitulate some of the issues referred to in the discussion of this work, it should be underlined:

1. That the peculiarities of some of the variables that predict the improvement achieved with the Passive treatment would indicate, by and large, the implication of cognitive aspects such as suggestibility, or person characteristics such as more advanced age or low level of education, which may reinforce the involvement of these cognitive aspects. Also, varia-

bles such as low impatience characterize patients that are less "needful" of an Active treatment to remedy their problems of perception of the environment or of their relationship with others. Finally, the intervention of the percentage of associations during the baseline can be explained as a paradoxical effect of Passive treatment in hypervigilant subjects.

2. That the three variables involved in the prediction of the effectiveness of Active treatment are, in sum, variables coherent with the logic of that approach, since they combine different beneficial aspects for the active participation of patients in their treatment process.
3. That the association established by the patient, through the self-record, between the pain episodes and concrete events, is especially relevant. This relevance derives from the fact that this same variable forms part of the two regression equations that predict the efficacy of the Passive treatment and, moreover, has a different sign in each equation. That is, and without forgetting the other set of variables involved in each case in the prediction, there exists the possibility of assigning subjects to one or the other treatment programme according to their differential characteristics in self-observation ability. Thus, an element as useful and common in the behavioural treatment of headache as the observation of situations functionally related to pain may aid our decision on whether to begin with the Active or Passive phase of treatment.

Finally, the relevance of this work for clinical practice resides in its reinforcement of the effectiveness of the psychological interventions normally employed (Active treatments) with the resources mobilized by an approach such as the Passive one –and not in simply substituting the former by the latter. Therefore, the utility of this research would lie in the fact that it makes it possible to decide, from the set of data collected in the assessment session, which approach it would be most beneficial to apply first for each subject, in accordance with his or her individual characteristics. In sum, it is no more than a small step toward the necessarily complex response to so simple a question as: Who, what and why? (Turk, 1990).

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