

# Behavioral activation versus cognitive restructuring to reduce automatic negative thoughts in anxiety generating situations

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## Abstract

**Background:** Recent studies have compared the efficacy of cognitive intervention compared to behavioral techniques for the treatment of different disorders. In line with that work, the empirical study presented here examined the efficacy of Behavioral Activation (BA) and Cognitive Therapy (CT) on Negative Automatic Thoughts (PANs) elicited in situations generating anxiety. **Method:** Based on a sample of 42 students aged 18 to 21 who took the ISRA B, BADS and EROS, 18 subjects with the highest scores were selected and assigned at random to one of two experimental groups or to a control group. Experimental Group 1 was given intervention based on CT and Experimental Group 2 based on BA. Both interventions consisted of five 60-min sessions. **Results:** Pre and post treatment measurement analyses reveal that both conditions effectively reduced the intensity of the anxiety response. However, BA was the only condition showing a significant reduction in ANTs. **Conclusions:** The results are discussed stressing the efficacy of BA in exclusively cognitive intervention.

**Keywords:** Cognitive therapy, behavioral activation, anxiety, automatic thoughts.

## Resumen

**Activación conductual versus reestructuración cognitiva para la reducción de pensamientos automáticos negativos ante situaciones generadoras de ansiedad.** **Antecedentes:** varios estudios han comparado la eficacia de las intervenciones cognitivas frente a las basadas en técnicas conductuales para el tratamiento de distintos trastornos. En línea con estos trabajos, se presenta un estudio empírico en el que se examina la efectividad de la Activación Conductual (AC) y la Terapia Cognitiva (TC) sobre los Pensamientos Automáticos Negativos (PANs) elicitados ante situaciones generadoras de ansiedad. **Método:** una muestra de 42 estudiantes entre los 18 y 21 años completaron el ISRA B, BADS y EROS. 18 sujetos con puntuaciones más altas se asignaron de forma aleatoria a dos grupos experimentales o a un grupo control. En el grupo experimental 1 se aplicó una intervención basada en la TC y en el grupo experimental 2 una a partir de la AC. Ambas constaron de cinco sesiones de 60 minutos cada una. **Resultados:** los análisis realizados revelan que ambas condiciones fueron eficaces para la reducción de la intensidad de la respuesta de ansiedad de acuerdo con las medidas pre y postratamiento. Sin embargo, para la cantidad de PANs, la AC fue la única condición en mostrar una reducción significativa. **Conclusiones:** se discuten los resultados destacando la eficacia de la AC sobre las intervenciones exclusivamente cognitivas.

**Palabras clave:** terapia cognitiva, activación conductual, ansiedad, pensamientos automáticos.

Since the seventies, Cognitive Therapy (CT) has had excellent empirical support as a treatment for wide-spectrum mental disorders (Beck, 1967, 1976). In this approach, certain thoughts, schemas or cognitions are due to pathogenic conditions which function as causal variables of the problem experienced. Therefore, the goal pursued by CT is to provide individuals with tools they can use to cope with their dysfunctional thinking (Beck, 1967), instead of concentrating on changing the environmental conditions in which the problem develops. In this way, prior to Beck's proposals, the main techniques that were developed in the 1950s in order to suppress negative automatic thoughts were: (1)

Thought-stopping from Joseph Wolpe, and (2) Self-instructional training, where Meichebaum considered eliminating chains of misfit thoughts proposing to de-automate them and to automate other functional chains by means of thought-dialogues. Later on, in the 1980s, Wegner and some collaborators (Wegner, Schneider, Carter, & White, 1987) hesitated about the usefulness of "direct mental control strategies" so they carried out several studies where they observed that voluntary suppression of thinking ends up turning counterproductive as there is often a "rebound effect" (Wegner, 1994), the cognitive effort to eliminate the thoughts in turn implies a vigil that maintains them latent. On the contrary, the contextual model supporting Behavioral Activation (BA) does not deny that thoughts, like any other form of behavior, influence the characteristic external behavior of the disorder, but they are not conceived of as its causal agents (Kanter, Busch, & Rusch, 2009). Therefore, cognitive processes such as rumination are of interest to BA, however, the focus of interest is directed toward the consequences or analysis of the process's function rather than

their content. Thus BA concentrates on “going into action”, even in the presence of negative thoughts and feelings (Kanter et al., 2009).

The exclusion of cognitive techniques from BA is an empirical as well as a theoretical question which has its roots in the analysis of the components of Beck’s CT by Jacobson et al (Jacobson et al., 1996). This study suggested alternatives to the cognitive hypothesis to explain the efficacy of CT treatment in depressive patients. Two specific alternatives to the cognitive hypothesis were considered, the activation hypothesis and coping (Pérez-Álvarez, 2007). To test them, the authors established that Beck’s CT was divided into three basic elements: scheduling activities, which Jacobson called –behavioral activation– and responded to the activation hypothesis, behavioral activation and cognitive restructuring, including automatic thoughts related to the coping hypothesis, and finally, complete CT (behavioral activation, automatic thoughts, cognitive restructuring and modification of core beliefs), related to the cognitive hypothesis (Pérez-Álvarez, 2007). This showed that complete CT did not provide better results than cognitive restructuring or behavioral activation. Furthermore, complete CT was no more effective than behavioral activation in preventing relapse at a two year follow-up (Gortner, Gollan, Dobson, & Jacobson, 1988). Later, after the findings of Jacobson et al., authors such as Dimidjian and his team (Dimidjian et al., 2006) did a randomized clinical study with several groups, including a control group, in which after sixteen weeks he compared the efficacy of BA, CT, pharmacotherapy and the placebo for treating depression. The results showed that all the treatments, including the placebo, were practically all equally effective in moderate depression, however, BA and medication were better than CT and the placebo in major depression at the end of treatment (Dimidjian et al., 2006). Two years later, some authors (Dobson et al., 2008) proposed analyzing the lasting effects on relapse and recurrence of patients previously exposed to BA, CT, antidepressant (paroxetine) and placebo experimental conditions. Analyses confirmed the hypothesis previously established: no significant differences were found insofar as the results observed under BA and CT conditions over the extensive follow-up time. However, psychotherapy, whether in the form of BA or CT, had a lasting effect which was at least as effective as continuous administration of antidepressants and better than its withdrawal for prevention of relapse and recurrence. In brief, the results of both studies (Dimidjian et al., 2006; Dobson et al., 2008) caused BA to be postulated as a treatment apart from those clustered under the label of cognitive therapies, since it places CT itself, both in theory and practice, in doubt, and adopts a contextual approach radically different from the one posed by those therapies, which would correspond rather to a medical model (Pérez-Álvarez, 2007).

Even though the origin of BA has been related to a type of specific pathology, depression, it is today an effective psychological intervention model for the treatment of various disorders, such as dysthymia and bipolar disorder (Barraca & Pérez-Álvarez, 2015), depression with anxiety symptoms (Barraca, 2010) and other diagnostic categories such as anxiety (Turner & Leach, 2010), having thus become transdiagnostic.

Turner & Leach (2009) did a study on the efficacy of Behavioral Activation for the Treatment of Anxiety (BATA: *Behavioral Activation Treatment of Anxiety*) in several patients diagnosed with anxiety disorder. The results showed clinically significant reduction in avoidance behavior as well as anxiety in all cases,

which was further maintained three months after the follow-up stage. In agreement with these data, Soleimani et al. (Soleimani et al., 2015) compared the efficacy of BA and CT for reducing symptoms of subsyndromal anxiety and depression in a sample of university students. The results revealed that both treatments were able to diminish the intensity of anxiety and stress symptoms, as well as the participants’ functional impairment. However, the BA condition was more effective than CT in the reducing depressive symptoms.

These findings on the usefulness of BA in anxiety as well as for traditional depression have led to the present study’s examination of the differential efficacy of CT and BA on the intensity of the anxiety response and Automatic Negative Thoughts (ANTs). That is, those elicited in situations that generate anxiety, are aversive and oppose Automatic Positive Thoughts (APTs), which are positive for stimulating a similar situation, and which would be perceived in this case as an opportunity for coping. It is hypothesized that both intervention methods (BA and CT) will be effective in diminishing the anxiety response, as in fact the literature has demonstrated, but BA will promote more active behavior and specific effects, and therefore, because of how it is implemented, more parsimonious and simpler to apply.

## Method

### Participants

The total sample was comprised of 42 students in the first year of Communications at a private university in the Region of Madrid. The age range was 18 to 21 with a mean of 19.4 and 80% were women. After applying the evaluation instruments selected, 18 of the students with significantly higher scores on one of the instruments (ISRA B), who met the experimental conditions, were selected as the participants.

All the students gave their written informed consent for participating in the research.

### Instruments

*Inventario de Situaciones y Respuestas de Ansiedad Breve [Brief Inventory of Anxiety Situations and Responses]* (ISRA-B) (Miguel-Tobal & Cano-Vindel, 1994). This is composed of three subscales that evaluate cognitive anxiety, physiological and motor levels and a total anxiety trait scale. Internal consistency measured by the Cronbach’s alpha coefficient yielded scores of .89 for the total anxiety trait. In this study, thirteen of the twenty-two situations proposed were selected: one referring to the first subscale (FI) and four for each of the other subscales (FII, FIII and FIV). The criterion followed for this selection was the possibility of reproducing the subjects’ natural context. An open question was also included to identify automatic thoughts elicited by each of these situations: “What comes to mind when this situation could arise?”

*Behavioral Activation for Depression Scale – BADS* – (Kanter, Mulick, Busch, Berlin, & Marttel, 2007. Spanish adaptation by Barraca, Pérez-Álvarez & Lozano-Bleda, 2011). This is a 25-item scale for evaluating the behavior responsible for change in the framework of BA therapy. The items are grouped in four subscales. The first subscale, Activation, consists of seven items that evaluate the level of activity of the individual in his setting.

The second subscale, Avoidance/Rumination, has eight items directed at evaluating the level of avoidance of aversive thoughts and feelings. The last two subscales, Work/School Impairment and Social Impairment, consist of five items each and evaluate the degree of impairment of the rest of the subscales in these areas. Moreover, a general score for all these dimensions which could be defined as the degree to which the individual is in a situation of activation (that is, is involved in activities) and copes with depressive symptoms and their consequences. The scale has adequate internal consistency (Cronbach alpha = .87) and test-retest reliability ( $r_{xx} = .74$ ). The Spanish version used in this study (Barraca et al., 2011) has shown reliability (Cronbach's alpha = .90) and validity (high correlations with the BDI-II, AAQ, ATQ, MCQ-30, STAI and EROS) in keeping with the original instrument.

*Environmental Reward Observation Scale* – EROS – (Armento & Hopko, 2007. Spanish adaptation by Barraca and Pérez-Álvarez, 2010). This is a brief ten-item instrument developed to acquire an objective self-evaluation of the degree to which the setting is rewarding for the individual. The scale has adequate internal consistency (Cronbach's alpha = .85) and test-retest reliability ( $r_{xx} = .85$ ). The Spanish version used here (Barraca et al., 2010) is also reliable (Cronbach's alpha = .86) and valid (high correlations with the BDI-II, BADS, STAI-E/R, AAQ; significant differences between clinical and nonclinical participants in ANOVA) in line with the original instrument.

Other self-recording measures employed during treatment were:

- CT Group: Self-record of Automatic Thoughts and Dysfunctional Thought Record (DTR).
- BA Group: Self-record of Automatic Thoughts and Self-Record of exposure to the specific situations presented in the ISRA B.

### Procedure

Three groups were compared: (1) BA Group (based on scheduling activities); (2) CT Group (based on cognitive restructuring) and (3) Control Group (no specific intervention applied).

The BA (Barraca & Pérez-Álvarez, 2015; Kanter, Busch, & Rusch, 2009) and TC (Beck, Rush, Shaw, & Emery, 1979) manuals were followed to design each of the intervention sessions and ensure proper application of both techniques.

When the evaluation instruments had been selected and the intervention sessions designed, a group session was held with the participants. Material was distributed that included an informed consent form and the ISRA B, BADS and EROS questionnaires as complementary measurement instruments. Later, the experimental and control groups were formed according to their ISRA B scores. This was done by calculating the mean of the results found for the original sample and selecting those with total score above 21.63 points, leaving 18 subjects who were each later assigned at random to one of the groups proposed.

### Treatments

#### *Cognitive Therapy Group:*

The purpose of the experimental protocol for the CT condition was to restructure the ANTs elicited by situations generating

anxiety. Therefore, cognitive restructuring was applied in this order: (1) first session, psychoeducation on the interaction between the situation, cognition (thoughts), emotion and behavior; (2) second session, guided identification of automatic thoughts; (3) third session, Dysfunctional Thought Record (DTR), (4) fourth session, individual guided discovery of ANTs presented in the highest anxiety situations on the ISRA B.

The main goals of CT were: (1) teach the participants the relationship existing among situations, thoughts, emotions and behavior, (2) learn to identify and capture automatic thoughts and associated emotions, paying attention to their natural context, (3) find out the automatic negative thoughts elicited by situations presented in the ISRA B (where the subjects scored highest), and (4) evaluate such situations paying attention to all the data existing to facilitate the formulation of alternative explanations. The final goal, taken as a dependent variable, was reducing the intensity of the anxiety response and loss of credibility of automatic negative thoughts elicited by the situations proposed in the ISRA B.

#### *Behavioral Activation Group:*

The experimental protocol for the BA condition consisted of teaching participants to restrain the dysfunctional thoughts elicited by situations generating anxiety through behavioral activation. This was done by activity scheduling for the following goals: (1) teach the participants the basic principles of operant conditioning, (2) learn to identify automatic thoughts in their natural context, (3) find out the negative thoughts elicited by situations presented in the ISRA B (where the subjects score highest), and (4) graduated exposure to these situations to test the unhelpful assumptions and carry out helpful behavior. The goal pursued was to use such exposure to extinguish or reduce dysfunctional behavior patterns in situations generating anxiety, especially avoidance, conceptualized as negative thoughts. Exposure to these situations and extinguishing avoidance behavior would favor an increase in activation level (thereby recovering contact with natural reinforcement sources available in the environment). As well as a reduction in the intensity of the anxiety response despite not being a technique whose main purpose is the emotional direct control, but its modification through the environmental management. These goals are distributed in the sessions as follows: (1) and (2) first session, (3) second session, and (4) second, third, fourth and fifth session, coming to a total of three weekly exposures to the same situation (each subject completed nine exposures during the program referring to three situations generating a high anxiety response).

In the fifth session in both experimental conditions, the goals posed were summarized analyzing how well they had been achieved on a whole, and what had been learned. At the end of the session, the questionnaires selected were given again.

The experimental protocols were applied in each of the groups in five weekly 60-minute sessions in April and May 2016.

The control group did not receive any intervention during that time.

#### *Data analysis*

According to the small number of participants and the lack of normality of the studied variables, nonparametric statistics tests were applied in order to analyze the results: (1) *Wilcoxon*, to analyze the intragroup differences of the studied variables; (2) *H*

of *Kruskal Wallis*, to enable to verify the intergroup differences and, (3) *U of Mann-Whitney*, in order to observe between specific groups, the differences found in the previous test. SPSS 20.0 was used to analyze the data.

Results

Table 1 shows the differences (mean and standard deviation) in the pre-test and post-test scores in the experimental and control groups for the total ISRA B score, ANTs and APTs and total scores on the BADS and EROS. The Z score and its associated significance are also included. As was hypothesized, the results of both types of therapy (BA and CT) show that they were effective in reducing the intensity of the anxiety response and increasing APTs compared to the control group. However, only the BA group was effective in reducing ANTs.

A nonparametric test was applied to the three independent samples (*Kruskal Wallis H test*) to check for significant differences among the three conditions. Table 2 shows the mean, standard deviation and average range for each of the groups, the  $\chi^2$  value and its associated significance. As observed in the results, there were significant differences in the BADS questionnaire BA subscale ( $\chi^2 = 6.67$ ;  $p = .03$ ), post-test APTs ( $\chi^2 = 9.00$ ;  $p = .01$ ) and post-test ANTs ( $\chi^2 = 10.17$ ;  $p = .00$ ). The average range of activation behaviors was highest in the BA group. The CT group showed the highest average range in APTs (post-test). The control group had the highest average range in ANTs (post-test). There are therefore significant differences among the groups (CT, BA and Control) in the level of activation behavior and posttreatment ANTs and APTs

To check which conditions were really differentiated in the three groups (CT, BA and Control), a *Mann-Whitney U test*, similar to an ANOVA post-hoc test, was done. The most important results of this analysis are found in Table 3, which shows the variables where the between-group differences were significant, the groups corresponding to this difference, the mean, the median and the average range of each group. The statistical comparison

value (*Mann-Whitney-U*) and its associated significance are also presented for each of the differences found.

The results of the analysis show significant differences between: (1) The CT and BA groups in the level of activation behavior: The subjects who went through BA had the highest scores, (2) The CT and Control groups and BA and Control in the ANTs (post-test): the Control Group had more of these thoughts in both cases, (3) The CT and Control groups in APTs (post-test): the CT Group had more of these thoughts.

Discussion

The results show that both CT and BA were effective in reducing the intensity of the anxiety response and ANTs, which were always higher in the control group than in the experimental groups. This finding is consistent with previous studies in which both types of intervention significantly reduced the physiological symptoms of the anxiety response in a sample of students (Soleimani et al., 2015). The data presented here also highlight that APTs increased significantly in the CT Group after intervention, this may be explained due to it was the unique group that was trained in the formulation of alternative explanations to his thoughts. Nevertheless, activity scheduling in the AC group was more effective in reducing ANTs. These data are somewhat paradoxical for CT, since although it is true that APTs increased in this group, ANTs would have been expected to be reduced in like manner, since they are the focus of the therapeutic work. This result might be explained by the rebound effect (Wegner, 1994), which in turn suggests that the cognitive-emotional change (in this case anxiety) may be, as BA postulates (Jacobson et al., 1996), working from “outside-in”, and not directly on cognitions, but through changes in behavior.

Another fact to be underlined stems from BA being the intervention that, as expected, was able to change activation behaviors, while CT did not promote them. Therefore, the data in this study could place in doubt that cognitive work alone by questioning and restructuring negative thoughts, necessarily leads to behavior modification.

Table 1  
Means, Standard deviations, Z score and associated significance (p) for the experimental and control groups calculated using the Wilcoxon test (N = 18)

	Cognitive therapy				Behavioral activation				Control group			
	M	SD	Z	p	M	SD	Z	p	M	SD	Z	p
ISRA B												
pre-test	25.50	2.88			27.17	5.03			32.17	4.99		
post-test	18.17	4.70	-2.20	.02*	15.50	3.50	-2.20	.02*	27.83	4.99	-1.76	.07
APTs (pre-test)	3.83	1.72			2.33	1.63			1.09	1.09		
APTs (post-test)	6.83	1.47	-2.20	.02*	5.00	2.53	-1.89	.05*	2.17	1.60	-.37	.70
ANTs (pre-test)	5.83	1.94			7.33	2.25			9.33	1.75		
ANTs (post-test)	4.17	1.16	-1.82	.06	4.67	1.86	-2.21	.02*	8.67	1.63	-1.19	.23
BADS												
pre-test	101.17	16.79			89.33	23.83			90.50	14.09		
post-test	113.83	16.22	-1.26	.20	91.17	16.78	-.21	.83	96	15.13	-1.57	.11
EROS												
pre-test	30.17	3.48			27.17	4.11			23.67	3.83		
post-test	31.33	3.01	-.94	.34	28.17	4.70	-1.47	.14	25	6.66	-.73	.46

\*  $p < 0.05$

Note: ISRA B = Inventario de Situaciones y Respuestas de Ansiedad Breve [Brief Inventory of Anxiety Situations and Responses], APTs = Automatic Positive Thoughts in situations generating anxiety, ANTs = Automatic Negative Thoughts in situations generating anxiety, BADS = Behavioral Activation for Depression Scale; EROS = Environmental Reward Observation Scale

*Table 2*  
Means, standard deviations, average ranges,  $\chi^2$  and associated significance (*p*) for the variables compared by group using the Kruskal-Wallis test (N = 18)

	Group	M	SD	Average range	$\chi^2$	p
ISRA B	CT	7.44	5.41	9.17	4.29	.11
	BA			12.83		
	CONTROL			6.50		
BADs	CT	-6.67	17.33	8.08	.72	.69
	BA			10.67		
	CONTROL			9.75		
FI.BADs	CT	-.33	5.59	5.67	6.67	.03*
	BA			13.58		
	CONTROL			9.25		
FII.BADs	CT	-4.50	9.17	9.83	.03	.98
	BA			9.25		
	CONTROL			9.42		
FIII.BADs	CT	-1.11	7.96	9.50	.19	.91
	BA			8.83		
	CONTROL			10.17		
FIV.BADs	CT	-.72	5.30	7.58	3.58	.16
	BA			12.83		
	CONTROL			8.08		
EROS	CT	-1.17	2.85	9.25	.02	.99
	BA			9.67		
	CONTROL			9.58		
APTs (post-test)	CT	4.67	2.67	13.67	9.00	.01*
	BA			10.25		
	CONTROL			4.58		
ANTs (post-test)	CT	5.83	2.55	6.17	10.17	.00*
	BA			7.25		
	CONTROL			15.08		

*p*<0.05  
 Note: ISRA B = Inventario de Situaciones y Respuestas de Ansiedad Breve [Brief Inventory of Anxiety Situations and Responses], BADs = Behavioral Activation for Depression Scale, FI.BADs = Subscale I of the BADs questionnaire (activation behavior level), FII.BADs = Subscale II of the BADs questionnaire (avoidance/rumination level), FIII.BADs = Subscale III of the BADs questionnaire (work/school impairment), FIV.BADs = Subscale IV of the BADs questionnaire (social impairment), EROS = (Environmental Reward Observation Scale); APTs = Automatic Positive Thoughts in situations generating anxiety, ANTs = Automatic Negative Thoughts in situations generating anxiety, CT = Cognitive Therapy; BA = Behavioral Activation

*Table 3*  
Means, Medians, Average ranges, Comparison statistic (*U*) and associated significance (*p*) for the groups compared with the Mann-Whitney U test (N = 18)

	M	M <sub>E</sub>	Average range	U of Mann-Whitney	p
FI. BADs					
CT	-.33	-.50	4.25	4.50	.03*
BA	2.00	2.00	8.75		
ANTs (post-test)					
CT	5.83	5.00	3.50	.00	.00*
CONTROL	2.00	2.00	9.50		
BA	5.83	5.00	3.92	2.50	.01*
CONTROL	2.00	2.00	9.08		
APTs (post-test)					
CT	4.67	5.00	9.50	.00	.00*
CONTROL	2.00	2.00	3.50		

*p*<0.05  
 Note: FI.BADs. Activation = Subscale I of the BADs questionnaire (activation level), ANTs = Automatic Negative Thoughts in situations generating anxiety, APTs = Automatic Positive Thoughts in situations generating anxiety CT = Cognitive Therapy; BA = Behavioral Activation

In view of these results, in which the differences among the groups were significant for three of the variables studied, the BA Group having reported more activation behaviors than the CT Group, the BA and CT groups shown fewer ANTs than the Control Group, and the CT group more APTs than the Control Group, important backing for the BA model has been acquired. The increase in activation behaviors observed in the groups after intervention is in line with the results found in previous studies (Turner & Leach, 2009) and is also congruent with the nature of the therapy itself, where increase in behavioral activation of the patient is the first goal. It is important to stress that BA not only produces a significant reduction in motor (escape/avoidance) and physiological (intensity) anxiety response symptoms, but also changes on the cognitive plane (ANTs) as described above.

Even though the results found are promising for the theoretical basis of an intervention like BA, this study has several limitations. In the first place, the size of the sample selected to form part of the experimental and control groups was small, which limits generalization of the results and presence of other significant differences among groups. Furthermore, the participants came from a specific population and the results should not be extrapolated beyond this population. In the second place, the time available in each of the sessions, although it met with the goals originally

posed, turned out to be insufficient to adequately undertake the needs shown by each of the subjects. Finally, the intervention programs designed were specifically directed at treating the anxiety response on the cognitive and physiological planes. This may explain the absence of statistically significant differences in pre and posttreatment scores in some variables which were also present in the BADS and EROS questionnaires.

We believe that one important contribution of this study is the change in the cognitive variable analyzed (ANTs and APTs)

since in spite of the existence of several studies presenting major empirical evidence (Dimidjian et al., 2006; Dobson et al., 2008; Jacobson, 1966; Turner & Leach, 2009) on the efficacy of these two therapeutic approaches in different types of symptomatology, no study to date has compared this efficacy specifically over a cognitive variable. These results are, moreover, new support including BA therapeutic strategies in the for treatment of various disorders, specifically, anxiety, and may therefore be considered a transdiagnostic intervention.

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