EFFECTIVENESS OF AN HYPNOTIC IMAGERY INTERVENTION ON REDUCING ALEXITHYMIA

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Abstract

The therapeutic potential of the use of mental representations, such as mental images, might be an interesting approach in the treatment of people who are severely impaired with respect to the processing of emotion, and in particular the activation of mental images. That is the case of alexithymia, which is a multifaceted construct comprising (a) difficulty identifying feelings and distinguishing between feelings and the bodily sensations of emotional arousal; (b) difficulty describing feelings to others; (c) a restricted imagination, as evidenced by a paucity of fantasies; and (d) a cognitive style that is literal, utilitarian, and externally oriented (Taylor and Bagby, 2000). Thirty-one alexithymic female students were randomly distributed into two conditions: hypnotic imagery condition and control condition. Participants in the hypnotic imagery condition took part in an 8-session individual training programme. The findings indicate that hypnosis is an effective technique for obtaining a decrease in alexithymic scores. The findings also indicate that changes in mood states are not involved in the change in alexithymia scores. This suggests that hypnosis has exerted a direct effect upon alexithymia (not attributable to anxiety or depression), and consequently demonstrates that it is possible to exert an effect (i) upon alexithymia without targeting a decrease in anxiety or depression scores, (ii) upon alexithymic people with no anxiety or depression problems, as anxiety and depression are not the therapeutic determinant of the therapeutic response. Copyright © 2008 British Society of Experimental & Clinical Hypnosis. Published by John Wiley & Sons, Ltd.

Key words: alexithymia, hypnosis, mental imagery, training

Introduction

Most psychotherapies place stress on verbal thoughts. This requires active involvement on the part of the patients, associated with the ability to elaborate and to confront emotions. As the therapeutic focus needs to be on the meanings that can be accessed through imagery, memories and dreams as well as verbal thoughts (Beck, 1976), there are other potential methods of treating specific populations than the verbal one. Mental imagery is one of these techniques, which has proven to be effective in producing behavioural and physiological changes (e.g. Lang, 1979; Ahsen, 1984a; 1984b; Abraham, 1993; Gay, Philippot and Luminet, 2002; Sheikh, 2003; Hackmann and Holmes, 2004).

A mental image can be defined as 'a mental representation of something not by direct perception but by memory or imagination' (Harper Collins, 1995). It belongs to a system of information processing, parallel to the verbal system: the mental imagery system (Paivio, 1971; Kosslyn, 1975). This system has three functions: (i) a mnemonic function, which keeps the representation of the perception in long-term memory; (ii) an elaborative function, especially involved in the internal representation of the world and of personal goals; and (iii) a creative function, consisting in arranging different imagery units together in representations that do not exist in reality (e.g. a pink elephant; Denis, 1991).

Psychotherapeutic techniques using imagery may differ in terms of names and theoretical backgrounds but may actually be very similar in terms of practice. That is the case, for instance, for hypnosis and guided imagery. The distinction between the two was originally made as a consequence of debates on the role attributed to mental imagery in the hypnotic process (e.g. Barber, 1972; Spanos, 1972). There are different ways of working with images, all of which aim at reframing: image substitution (Ahsen, 1984a; Hackmann, Bennett and Levy, 2004); image modification (Andrade, 1997; Grey, Young and Holmes, 2002); and the use of metaphors, which is known to generate mental images and to facilitate associative memory (Katz and Paivio, 1975). This last technique is broadly used in modern hypnosis (e.g. Erickson, 1977). The therapeutic potential of the use of mental representations, such as mental images, might be an interesting approach in the treatment of people who are severely impaired with respect to the processing of emotion, and in particular the activation of mental images. People scoring high on alexithymia would be particularly interesting to examine in this context.

Alexithymia is a multifaceted construct comprising (a) difficulty identifying feelings and distinguishing between feelings and the bodily sensations of emotional arousal; (b) difficulty describing feelings to others; (c) a restricted imagination, as evidenced by a paucity of fantasies; and (d) a cognitive style that is literal, utilitarian, and externally oriented (Taylor and Bagby, 2000). These cognitive and affective characteristics were observed initially among patients with classic psychosomatic diseases (Nemiah, Freyberger and Sifneos, 1976), but were subsequently observed also among patients with a variety of psychiatric disorders that involve disturbances in emotion regulation, including substance use disorders, post-traumatic stress disorders, panic disorder, somatoform disorders and eating disorders (Krystal, 1988; Taylor, Bagby and Parker, 1997; Taylor, 2000). It has been suggested that the features comprising the alexithymia construct reflect deficits in the cognitive processing and regulation of emotions (Taylor et al., 1997), even if alexithymia in itself cannot be considered as a psychopathological feature. As an individual difference, alexithymia overlaps conceptually with the emotional intelligence construct, which encompasses the ability to perceive and appraise one's own and other's feelings and emotions, the ability to access and use feelings to guide one's thinking and action, and the ability to regulate emotions to promote emotional and intellectual growth (Mayer and Salovey, 1997). As characteristics of alexithymia include externally oriented thinking and avoidance of confronting emotion, and as these patients are reluctant to engage in a therapeutic process based on verbal thoughts and could present a risk of somatization when involved in the therapeutic process (Marty, De M'Uzan and David, 1963), it is necessary to develop alternative therapeutic approaches. Considering that the restricted imaginal capacities of alexithymic people limit the extend to which they can modulate negative emotions by imaginative activities that have positive connotations, such as fantasy, dreams and play (Krystall, 1988), an approach based on imagery could

be an interesting alternative, in order to accelerate the use of imagery with positive connotations, to accelerate mild confrontation to negative emotions and to reframe those emotions.

High alexithymia scorers show lower imaging capacities than low scorers (Campos, Chiva and Moreau, 2000); nevertheless one clinical case study using mental imagery was shown to be effective in reducing alexithymia in a fifteen-session hypnotic imagery therapy for a female hives patient (Suzuki, 2005). The author did not mention the alexithymia scores obtained by the patient before and after treatment, which limits the conclusions, but this paradox should be investigated in order to better define the therapeutic indications for the alexithymic population. Anyway, if alexithymic people do have lower imagery abilities and tend to avoid emotional significance, which probably leads to a restricted use of mental imagery, it does not mean that they do not have any abilities nor that they are unable to activate images. Thus, the use of images in a therapeutic context seems to be pertinent.

The aim of the present study is to investigate whether a controlled hypnosis treatment is effective in reducing alexithymia scores. In addition, the study was designed to clarify the impact on the therapeutic response of changes in mood states, such as depression and anxiety, which can also account for the changes in alexithymia scores.

To this end, two experimental groups were created: a waiting-list control condition and a hypnosis condition in which participants followed a standardized eight-session hypnosis treatment.

Methodology

Participants

Thirty-six female students (mean age: 18, 46 SD: 3.38) volunteered to participate in the study, recruited from classes in auditoriums (N = 406) provided by the Catholic University of Louvain at Louvain-la-Neuve, Belgium.

The inclusion criteria were the following: (i) to be a female student at the Catholic University of Louvain at Louvain-la-Neuve, but not in the psychology department, as those students are more likely to pay attention to their emotions; (ii) to score >60 in the alexithymia scale Tas-20, which is considered in the literature as the clinical threshold (Taylor et al., 1997). Characteristics of the sample are given in Table 1.

Pre-recruitment questionnaires checking alexithymia were distributed to potential participants in large first and second year classes at the university.

Participants were later called if they matched the inclusion criteria. We chose female students because they were more numerous than male students in the auditoriums (n = 226 *versus* n = 129) and more of them had a clinical score (TAS-20 score >60 scale n = 55 *versus* n = 14). Of the fifty-five students matching the criteria, thirty-eight agreed to participate in the study. The sample scored, M = 65.23 (SD = 5.20) at the Tas-20, which is very close to the average scores registered by the 69 alexithymic people from the auditoriums, M = 65.15 (SD = 3.74), and by the 55 alexithymic female students, M = 65.28 (SD = 3.76). 22.6% of the female students in our sample had health problems, which is similar to the scores registered by the 69 alexithymic people: 23,1% and by the alexithymic female students: 23%. We note two differences between the female students who agreed to participate and those who refused: 35% of the sample do have eating disorders (inclusive 19.4% bulimia disorders) *versus* 17% in the alexithymic female students (*versus* 11% in the non-alexithymic female students). There is no participant in our sample who showed drug or alcohol disorders, whereas 22.2% of the alexithymics and

Table 1. Comparison between the experimental and the control group for variables assessing imagery abilities, psychopathology, mood state, initial trait alexithymia scores, self-esteem and quality of life

Type of variable	M (SD) for the experimental group (N = 14)	M (SD) for the control group (N = 17)	t values
Overall imagery abilities (QMI)	98.36 (16.86)	104.59 (14.19)	−1.18
Cognitive preference for images (IDQ-I)	15.71 (4.73)	16.94 (2.62)	−0.89
Cognitive preference for verbal information (IDQ-V)	16.92 (7.71)	14.50 (5.66)	0.98
SCL 90-R-anxiety	14.07 (5.37)	12.24 (5.31)	0.95
SCL 90-R-somatization	11.36 (5.26)	12.25 (7.72)	−0.36
SCL 90-R-psychotic traits	8.29 (2.52)	9.12 (3.20)	−0.79
SCL 90-R-paranoid traits	10.21 (3.74)	9.88 (2.91)	0.28
SCL 90-R-obsessive traits	15.21 (5.82)	11.35 (4.76)	2.03
SCL 90-R-hostile traits	9.79 (4.08)	9.94 (3.80)	−0.11
SCL 90-R-phobia	8.93 (4.36)	8.71 (4.75)	0.13
SCL 90-R-depression	11.21 (4.96)	11.12 (3.92)	0.06
SCL 90-R-symptoms	7.36 (3.48)	7.88 (2.96)	−0.46
SCL 90-R-vulnerability	9.36 (3.46)	8.47 (3.62)	0.69
Alexithymia-total score (Tas 20)	65.14 (5.00)	65.65 (5.16)	−0.27
Positive affectivity (PANAS-PA)	22.64 (7.80)	24.88 (6.68)	−0.85
Negative affectivity (PANAS-NA)	19.36 (4.43)	20.29 (7.19)	−0.42
Depression (Zung)	42.07 (.83)	42.24 (1.09)	−0.46
State anxiety (STAI-A)	43.14 (9.20)	49.59 (12.99)	−1.56
Trait anxiety (STAI-B)	52.36 (7.07)	52.59 (8.73)	−0.08
Self-esteem Total (SEI)	50.29 (13.70)	53.88 (15.52)	−0.68
Quality of life profile-satisfaction	12.86 (18.69)	15.69 (12.75)	−0.49
Quality of life profile-place	49.43 (11.13)	57.24 (12.35)	−1.83
Quality of life profile-expectancies	9.86 (13.04)	8.75 (10.43)	0.26
Quality of life profile-face	5.50 (12.49)	3.41 (16.01)	0.40

15% of the alexithymic female students had such disorders. The characteristics of the alexithymic people in the auditoriums meet the classical relationships found between alexithymie and health problems and addictions (eating, alcohol and drugs disorders) and the sample who agreed to participate in the experiment did not differ from the other alexithymics in the general sample. The alexithymic female students who refused to participate were mostly those with alcohol or drug addictions, whereas the students with eating disorders widely agreed to participate.

The thirty-eight participants were randomly distributed into two conditions: hypnosis (19) and control (19). As the students were potentially recruited from the same classes and could possibly talk about the experiment and compare instructions, we told them they would be participating in different experiments not connected to each other. Thus, members of the control condition could not know what was going with their classmates in the intervention condition, 1) because there are numerous students in the auditoriums and 2) because it is very common to ask students to take part in various psychological experiments.

The participants of the hypnosis condition were told that they would be participating in a research project investigating the relaxation method. The participants of the control

condition were told they were participating in a research project investigating the quality of life of female students.

Seven participants dropped out of the sample: either they discontinued their university studies or did not return their questionnaires. The final sample is based on 31 participants, 14 in the hypnosis condition and 17 in the control condition.

Measures

Imagery ability and preferences for an imagery cognitive style

The Bett's Questionnaire of Mental Imagery, (QIM; 1907), revised by Sheehan (SQMI; 1967), and the Individual Difference Questionnaire, (IDQ; Paivio, 1983) were used in order to investigate respectively imagery ability and preferences for an imagery cognitive style.

The SQMI is a shortened version of the QMI. It is 35 items long and measures vividness across the visual, auditory, cutaneous, kinaesthetic, olfactory, gustatory and organic sensory modalities. There are five items per modality, each on 7-point Likert scales ranging from 0 ('no image at all)' to 7 ('perfectly clear and as vivid as the actual experience'). The SQMI shows good psychometric properties (White and Ashton, 1977).

The IDQ contains 86 items designed to measure imaginal and verbal thinking habits and skills, with a true-false answer possibility (French validation by Grebot, 2000).

A measure of imagery activity during each session was elaborated for the research on scales from 0 to 4. *Presence* of images was assessed from 0, 'no image', to 4, 'permanent presence of images throughout the session'; *vividness* of images was assessed using questions directly derived from Sheehan's Questionnaire of Mental Imagery, ranging from 0, 'no vividness', to 4, 'as vivid as reality'; and *organization* of images, from 0, 'no structured images', to 4, 'fluid images organized like a scenario'.

Measures of anxiety, depression, self-esteem, quality of life and current mood

In order to investigate anxiety, depression, self-esteem, quality of life and current mood, the following scales were used.

The State and Trait Anxiety Inventory (Spielberger, 1983), is a broadly used self-administered questionnaire that evaluates two dimensions of anxiety (state anxiety and trait anxiety) on separate scales. Each scale is a 20-item scale and the participants report their answer on a 4-point Likert scale (French adaptation: Schweitzer and Paulhan, 1990).

The Depression Self-rating Scale Zung (1965) is a 20-item scale that evaluates the affective, somatic and psychological dimensions of depression as a state on a 5-point Likert scale from 0, 'never', to 4, 'always'.

The Self-Esteem Inventory (Coopersmith, 1981) is a 58-item scale measuring four dimensions of self-esteem: social, professional, familial and general. The participants answer on a 2-choice scale ('sounds like me' or 'it doesn't sound like me').

The French Profile of Quality of Life (Dazord, 1996) is a 36-item, self-administered questionnaire, which evaluates four dimensions: somatic, psycho-affective, relations to others, and social life. It is characterized by its multidimensional pattern and subjective approach (i.e. the degree of satisfaction with various domains of life, the degree of change anticipated, and the importance attributed to these domains). The questionnaire is evaluated on a 5-point Likert scale from −2 (high dissatisfaction/change to the worse anticipated/very important) to 2 (high satisfaction). Zero means 'neither satisfied nor dissatisfied'.

The PANAS (Positive and Negative Affect Schedule; Watson, Clark and Tellegen, 1988) is a 20-item scale that measures the positive and negative affects the participant

is actually feeling (current mood state). The scale comprises two dimensions of 10 items each: a positive dimension (pleasure, joy, enthousiasm . . .) and a negative dimension (anxiety, angryness, shame, guilt . . .). The participant answers each item on a 5-point Likert scale from 1 (not at all) to 5 (very much).

Measure of psychiatric symptoms

This was taken using the Scl-90 R (Derogatis, 1977), a multidimensional self-report symptom inventory. It contains 53 items describing complaints or symptoms on ten dimensions: somatization, obsessions, interpersonal sensitivity (vulnerability), depression, anxiety, hostility, phobias, paranoiac features, psychotic features and diverse. The symptoms are evaluated on a 4-point Likert scale (French adaptation, Pariente, Lépine, Boulenger, Zarifian, Lemperière and Lellouch, 1989). All instruments have demonstrated good psychometric properties; the French validation of the QMI and the Self-esteem Inventory are on hand (laboratory of Clinical Psychology, Nanterre, France).

Procedure

Before the treatment period started, all participants completed different questionnaires assessing the dimensions of health status and psychological functioning and were randomly assigned to the hypnosis or to the control condition.

Participants of the hypnotic imagery condition took part in an 8-session training program in hypnosis. The sessions were individual, lasted about 30 minutes and took place every week. After 4 weeks of treatment, all participants were given an envelope with three questionnaires: Tas 20 (alexithymia), Stai A (State Anxiety), and Zung (depression). At the end of the sessions (after 8 weeks), all participants were given a second envelope with the following questionnaires: Tas 20 (alexithymia), Stai A (State Anxiety), Zung (depression), SEI (self esteem) and Scl 90 (psychiatric symptoms).

Hypnotic imagery condition

This condition is based on an indirect procedure. Hypnosis restricts the individual's perceptions of the external world by focusing his or her attention on specific internal stimuli, such as breathing. This attentional focus results in feelings of being removed from the environment and activates specific cognitive processes involving mental imagery. Participants were asked to sit in an armchair, close their eyes, and tell the experimenter about a pleasant holiday memory. The procedure started with a standardized relaxation induction. We chose a relaxation induction because direct inductions may generate resistance in patients. Participants were asked to relax their muscles and to be aware of proprio- and interoceptive sensations. This procedure lasted about 5 minutes. Then, participants were asked to imagine a pleasant holiday memory and pleasant feelings (e.g. excitement, calmness, joy, curiosity, surprise) were mentioned. This procedure also lasted about 5 minutes.

In each session, the experimenter read a different standardized script which lasted about 20 minutes while participants were involved in their imagery activity.

We chose an indirect procedure using neither direct nor posthypnotic suggestions able to elicit the production of emotions for two reasons: as alexithymic people tend to avoid confronting their emotions, direct suggestions could have led to anxiety and to a defensive reaction. The second reason is that we wanted them to mobilize personal resources (Erickson and Rossi, 1981). Thus, the activation of personal knowledge and procedural memory in the participants should lead to a better response to the therapy.

We then suggested that they feel different emotions while telling them 'fairy tales'. These are of particular interest as our population is likely to be more involved in the training and to experience an age regression when given the opportunity to listen to old stories from their childhood, as these evoke difficult situations and/or traumas, as well as violent and negative emotions that the participants could have experienced in their life without having to directly confront them. Each participant listened to eight fairy tales, presented in the same order.

Each script presents a well-known fairy tale involving *a traumatic situation* (e.g. abandonment in Hansel and Gretel, death wishes from a parent in Snow White and the Seven Dwarves and Sleeping Beauty, incest in Donkey Skin), and a large range of *negative feelings* connected with the traumatic situations.

However, we introduced a change in the mental state of the main character of the fairy tale, and proposed a reframing of the situation and/or original solutions. For example, the necessity of leaving the parents' house in order to become an adult in Hansel and Gretel; direct expression of negative feelings and refusal in Donkey Skin instead of taking flight; and the possibility to survive the assault of a parent in Sleeping Beauty and to pursue his/her own development in a positive way.

Because we do not have any preconception on the cause(s) of alexithymia, nor of how to ameliorate it, we decided to activate different targets: traumatic events and negative feelings connected with the situations, and we proposed different solutions based on the expression of emotions and self-assertiveness.

At the end of the session, participants were instructed to let the memories go like a pleasant dream, and to come back to the present. In the end, they answered the questions related to the activity of mental imagery during hypnosis. Each session lasted about 30 minutes.

Self-hypnosis practice suggestions were not given at the end of each hypnotic session, in order to have better control of the general effectiveness of the imagery technique on alexithymia, since all participants had the same level and quality of practising.

The experimenter was an advanced psychology female student who had undergone training in the laboratory for several months. This student followed treatment guidelines specifying the content of the intervention sessions and was asked to be friendly to the participants but to refuse to counsel them for personal problems if they were requested to.

Control condition
These participants did not receive any psychological treatment. They only came to the evaluation sessions.

Results

We first checked that the experimental group and the control group did not differ on variables that could affect the manipulation. As can been seen in Table 1, no differences ($P > 0.05$) were found related to personal abilities for mental imagery as measured by the IDQ (verbal or imagery favorite cognitive style) and the QIM (assessment of seven modalities: visual, olfactive, auditive . . .). The results were in line with the norm-values, indicating that alexithymic people in our sample do not show lower abilities, neither in general imagery (QMI) nor in imagery preference (IDQ).

No differences ($P > 0.05$) were found for dimensions of psychopathology as measured by the SCL-90-R, current mood (positive and negative affectivity measured by the

PANAS), depressive mood (measured by the Zung), trait and state anxiety assessed by the STAI, self-esteem (SEI) and quality of life (PQVS). We can thus conclude that the two groups were identical for these variables and that differences at the follow-up can be attributed to the effect of the experimental manipulation.

The results also show that the participants do have normal imagery abilities and anological preferences, and that they do not show any psychopathological disorders: they are neither anxious nor depressed and they have good self-esteem. They also express having a rather good quality of life. However their trait-anxiety values ($M = 52.43$, $SD = 8.41$) are slightly above the norm-value ($M = 36$, $SD = 10$), which corresponds to a light chronic anxiety (mean scores between 46 and 55).

We also examined if in the experimental group the mean level of vividness of imagery, presence of images during hypnosis and organization of the images reached a sufficiently high level. It might be argued that if these variables scored low it would be an indication that alexithymic people are not able to activate imagery as an active process that could explain changes in alexithymia scores. Results showed that averaged scores that were measured after each session were high (on scales from 0 to 5, M range for vividness: 2.79–3.36; M range for presence of images during hypnosis: 3.29–3.93; M range for organization of the images: 3.07–3.64). These results also indicated that there were only slight differences across sessions (except for vividness at session 3, which was below 3). MANOVAs with time as a repeated factor did not show an effect of time ($F < 1.2$, $P > 0.30$), which suggests that there were no specific sessions that were more able to activate imagery than others.

In order to test the relationship between the activation of vivid images during hypnosis and imagery assessed by questionnaires (QIM and IDQ), we conducted a one factor ANOVA with vivideness of imagery at the first evaluation as the independent variable. The results indicated that people whose scores $> = 4$ in vividness also had significant higher scores at the Mental Imagery Questionnaire ($m = 104$, $SD = 13.66$ vs $m = 76.67$, $SD = 76.67$ (4.13), $F(13) = 11.34$, $p = 0.006$), and had a preference for imagery as measured at the Individual Difference Questionnaire ($m = 17$, $SD = 3.87$ vs $m = 11$, $SD = 5.29$, $F(13) = 14.82$, $p = 0.002$). People with bulimia disorders do have higher scores on vividness of images during hypnosis compared to those without bulimia ($F(1,13) = 5.95$, $p = 0.03$), but the difference did not appear to be significant, QMI ($F(1, 29) = 0.39$, $p = 0.535$) and IDQ ($F(1,28) = 3.77$, $p = 0.062$).

In order to test the effect of the manipulation on alexithymia scores at the end of the treatment, we conducted an ANCOVA with total alexithymia score at the end of the treatment as the dependent variable, the treatment (hypnosis vs. control) as the independent variable, and alexithymia total score before the treatment as the covariate. Results showed that although the initial alexithymia score had an effect on the alexithymia score after the treatment, $F(1, 28) = 10.45$, $P < 0.01$, partial $\eta^2 = 0.27$, the effect of the manipulation was also significant, $F(1, 28) = 4.95$, $P < 0.05$, partial $\eta^2 = 0.15$. The mean total alexithymia score after the treatment was 57.29 (SD = 9.15) in the experimental group and 63.06 (SD = 6.28) in the control group.

An additional question was to examine whether the manipulation was the best predictor of alexithymia score changes. It is first possible that changes in mood states can also account for the changes in alexithymia scores. It is thus necessary to examine difference scores in depression and anxiety as possible alternative explanations. It is also possible that the changes in alexithymia scores were more pronounced in one group in the case that people had particularly high or low changes in depression or anxiety scores. We thus also considered the interaction of the manipulation by changes in depression or anxiety

Table 2. Alexithymia scores on TAS 20 before treatment, after 4 weeks and 8 weeks, as a function of group and measurement time

	Before treatment Mean (SD)	After 4 weeks Mean (SD)	After 8 weeks Mean (SD)
Hypnotic-imagery Condition	65.23 (5.20)a	58.00 (8.75)b	56.54 (9.07)b
Control Condition	65.33 (4.75)a	62.67 (8.83)a	63.27 (6.35)a

Note: Means not sharing a common subscript differ significantly ($p < 0.05$).

Table 3. Hierarchical regression analysis predicting difference scores in total alexithymia scores (before minus after treatment) by manipulation (control vs experimental), differences in depression and anxiety, and interaction effects

Factors	Final β	R^2	R^2_{adj}	R^2_{chg}	df	F	F_{chg}
Step 1: Manipulation		0.14	0.11		1.29	4.81*	
	−0.40*						
Step 2: Changes in depression and anxiety		0.26	0.18		2.27		2.18
Depression (−after minus before treatment)	−0.12						
Anxiety (−after minus before treatment)	0.32						
Step 3: Interactions		0.32	0.15		3.24		0.69
Manipulation x difference in depression	−0.13						
Manipulation x difference in Anxiety	−0.07						
Manipulation x difference in depression x difference in anxiety	−0.27						

Notes: Manipulation. Contrast codes were −1 for the control condition and +1 for the experimental condition.
*: $p < 0.05$.

scores. Finally, we considered a third-order interaction of manipulation x changes in depression x changes in anxiety. This would reflect the fact that changes in alexithymia scores were more pronounced in one group in the case that people had particularly high or low changes in depression and anxiety scores.

In order to test these hypotheses, we built a hierarchical regression analysis model predicting changes in alexithymia scores (before–after treatment)[1]. The difference score between the total alexithymia score after treatment minus the total alexithymia score before treatment was considered as the dependent variable. Negative scores are thus related to a decrease in alexithymia scores and positive scores to an increase. Then we entered the predictors in three blocks. The first block was for the manipulation measured by contrast codes (−1 for the the control condition and +1 for the experimental condition). In the second block, we entered differences in depression and anxiety (after treatment minus before treatment)[2]. In the third block, we considered the three possible interactions (manipulation x changes in depression scores, manipulation x changes in anxiety scores, manipulation x changes in depression scores x changes in anxiety scores). Results showed that only the first block was significant, $F(1, 29) = 4.81$, $P < 0.05$, $R^2 = 0.14$. A β coefficient of −0.40, $P < 0.05$, was obtained that indicates a higher decrease in alexithymia scores in the experimental group. This is a strong indication

that the changes in alexithymia scores are best accounted for by the experimental manipulation.

We did not register any significant changes in psychological measures after treatment (Stai A, Zung, PQVS, Scl-90, SEI). These analyses are therefore not reported.

Discussion

The aim of the present study was to investigate whether a controlled hypnosis treatment is effective in reducing alexithymic scores and to clarify the impact on therapeutic response of changes in mood states, such as depression and anxiety, which could also account for the changes in alexithymia scores.

The findings indicate that hypnosis is an effective technique for obtaining a decrease in alexithymic scores, which confirms clinical case studies.

The findings also indicate that changes in mood states are not involved in the change in alexithymia scores. This suggests that hypnosis has exerted a direct effect upon alexithymia (not attributable to anxiety or depression), and consequently demonstrates that it is possible to exert an effect (i) upon alexithymia without targeting a decrease in anxiety or depression scores; and (ii) upon alexithymic people with no anxiety or depression problems, as anxiety and depression are not the therapeutic determinant of the therapeutic response.

The technique is well accepted by participants because it requires neither active involvement in the therapeutic process nor introspective abilities. It is of special importance for alexithymic people who are not motivated to undergo therapy but present a risk for numerous mental pathologies and somatic disorders (Nemiah et al., 1976; Krystal, 1988; Taylor, Bagby and Parker, 1997; Taylor, 2000).

Concerning cognitive factors, we did not find that alexithymic people show lower imaging capacity than non-alexithymics, as found in Campos et al. (2000). Rather, our sample shows good abilities in mental imagery. The differences observed in the two samples might be explained by the difference in the measurement questionnaires (VVIQ vs QIM), but this alone does not suffice to explain why our sample shows these imagery abilities. It cannot be explained by an uncontrolled bias in recruitment in term of alexithymic characteristics, as the selected sample does not differ from the alexithymic female students in the auditoriums. It remains nevertheless possible that the people who enrolled in the experiment were predominately those with imagery abilities, even though we always mentioned relaxation as the technique used in the design and never mentioned imagery or hypnosis.

As neither hypnosis nor imagery abilities are related to intellectual level, the scores cannot be attributed to a specific intellectual superiority of our sample compared to the general population. The reason is perhaps due to the high percentage of alexithymic females with bulimia in the sample (19.4%). Indeed, the fact that they cannot resist the urge to eat and the tendency to act out could be subtended by vivid representations they cannot resist, which is not incompatible with a restricted imagination. The connection between vivid imagery representations and ideodynamism (Bernheim, 1916) was supported with the Creative Imagination Scale (Wilson and Barber, 1978). The small *n* compromised the disclosure of significant effects and we need a larger sample to make a conclusion. Future research has to carefully investigate the connection between imagery and alexithymia while (i) comparing the imagery abilities with the VVIQ versus the QIM in the same alexithymic population, (ii) evaluating the percentage of alexithymic people showing good imagery abilities in large samples, and especially in addictions, and (iii)

applying hypnosis in samples of alexithymic participants with high versus low imagery abilities, in order to see whether hypnosis is a good therapeutic indication for all alexithymic people or whether it is only reserved for a sub-category of this population.

Nevertheless, our findings tend to show that it is possible to have both alexithymic characteristics and good imagery abilities, and that reduced imagery abilities are not systematic in such a population.

Our findings also show that alexithymic people are able to activate images – moreover, vivid images – during each imagery session. What remains is to determine whether they would be able to activate such images spontaneously or not, and whether they use such images in daily life.

The relationship between absorption, which is required during imagery activity under hypnosis, and alexithymia also remains questionable because absorption in hypnosis is based on the ability to concentrate on one's internal world, and alexithymia tends to avoid such involvement. This might mean that alexithymic people do have absorption ability but do not use it in daily life. This would be very encouraging because it would mean that alexithymic people do not lack cognitive structures, especially those implied in imagery and absorption, but under-use or fail to use them.

Concerning the active components implied in the therapeutic response, we do not know whether they are (i) the emotions activated through images, independently of their contextual meaning, or (ii) the nature of the events evoked during the session and the cognitive reframing, or (iii) both. Thus, there is a lack in differentiating the therapeutic components, but as the purpose of the research was to investigate the possibility of obtaining a decrease in alexithymic scores in a nonclinical population, we made the choice of using different potential targets alexithymic people might be reactive to, without looking for a precise differentiation. Further research should investigate the different components, while comparing hypnosis training sessions with activation of images versus no activation versus cognitive reframing.

More research is needed to evaluate the impact of hypnosis and its components on the three factors implied in alexithymia (difficulty identifying feelings, difficulty describing feelings, and externally oriented thinking), in order to better identify the therapeutic targets.

Moreover, if a previous study (Gay et al., 2002) showed that the active component of the hypnosis treatment cannot be reduced to relaxation, it would be interesting to examine the respective effects of relaxation and hypnosis components in alexithymic people.

Further research should also check whether the decrease in alexithymia scores remains stable in the middle to long term. Such findings would give us valuable information about the kind of modifications we can obtain with hypnosis, whether punctual or structural.

Notes

1   As the baseline alexithymia score was almost identical in the two groups ($M = 65.14$ in the experimental group vs $M = 65.65$ in the control group) the difference score before-after treatment cannot erroneously be attributed to the manipulation, while it was rather explained by unequal initial levels in alexithymia scores. We also computed a regression model with alexithymia after treatment as the dependant variable, alexithymia before treatment, the manipulation, the interaction between manipulation and alexithymia before treatment, initial depresssion and anxiety as predictors. Similar conclusions were drawn: only alexithymia ($\beta = 0.48$, $p < 0.01$) and the manipulation ($\beta = -0.34$, $p < 0.05$) were retained as significant predictors.
2   The predictors were centered before the difference scores were computed.

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