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Emotional Change Processes in Music-Assisted Reframing

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Affective processes are critical to understanding and promoting lasting therapeutic change. Using a sample of 40 anxious adults, the researchers examined the use of music to increase affective modification and emotional restructuring in a cognitive reframing intervention. Subjects were assigned to either a typical reframing intervention or a music-assisted reframing intervention. Using the State-Trait Anxiety Inventory, Subjective Units of Distress Scale, Depression Adjective Checklist, and a Think-Aloud measure, the groups were compared on basis of anxiety-reduction, affective modification, and imagery vividness. Results indicate that the music-assisted reframing intervention was more efficacious than the typical reframing intervention in reducing anxiety, modifying affect, and promoting imagery-vividness.

Assumptions concerning the role of emotion in human change processes have changed considerably over the last three decades. With the rise of cognitive therapies, emotion came to be regarded as the byproduct of cognition, that is, epiphenomena best regulated by the cognitive system (Mahoney, 1993). Recently, the notions of rational supremacy and the cognitive/affective split have faded, and theories giving emotion a more integrated and causal role in human functioning have emerged (Greenberg & Pascual-Leone, 1995; Greenberg & Pavio, 1997; Greenberg & Safran, 1987; Mahoney, 1991, 1995; Pascual-Leone, 1991; Teasedale, 1983). These theories have, in part, been informed by findings generated

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by psychotherapy process and outcome research and by cognitive science.

One consequence of the growing interest in emotion is that forms of emotional change have received greater attention. Investigators studying the therapy process have repeatedly found that primary emotional change is correlated with therapeutic outcome. Early studies of individual and group psychotherapy revealed the benefits of emotional expression and arousal. For example, Liberman, Yalom, and Miles (1973), in their famous study involving 18 encounter groups concluded that "expression of intense personal feelings . . . (and) experiencing of strong emotions . . . were among the primary conditions of the personal change process" (p. 348). Studies exploring the role of affect in behavioral therapy have found that fear-reduction techniques (e.g., systematic desensitization) are, paradoxically, more effective when subjects experience high levels of physiological or subjective affective arousal (Borkovec & Sides, 1979; Lang, 1977; Michelson, Mavissakalian, & Marchione, 1985).

The benefits of intense emotional expression have also been demonstrated in individual psychotherapy. Greenberg and Foerster (1996) investigated the resolution of unfinished business by comparing 11 successful and 11 unsuccessful cases. Unfinished business was defined as an unresolved and problematic feeling toward a significant other (e.g., resentment, grief). The results indicated that "intense expression of feeling" was one of four in-session performance components that discriminated between resolution and nonresolution cases. Resolution was measured using four measures: the Structural Analysis of Social Behavior Scale, the Experiencing Scale, the Client's Emotional Arousal Scale, and "a need scale" (p. 439) constructed by the authors. The other discriminating performance components were expression of need, shift in representation of the other, and self-validation or understanding of the other.

Parallel research from the field of cognitive science has demonstrated that emotion and moods constrain a number of cognitive processes such as memory, learning, and perception. In one study, Bower (1981) demonstrated that mood-dependent memory applies to the reporting of real-life events. This effect was evident when subjects tended to remember and report emotionally-laden events that matched their mood at recall (i.e., recalled more sad

events when feeling sad, etc.). Forgas and Bower (1987) found that individuals' attention to the features of a situation is determined, in part, by the mood the person is in. Subjects who were happy spent more time describing positive qualities of a stranger than unhappy subjects who tended to describe more negative qualities. Memory, learning, and perception are critical cognitive processes in the context of therapy. By demonstrating the strong relationship between these processes and emotion, cognitive scientists have, albeit indirectly, illuminated the importance of considering emotional states when facilitating human change.

A number of authors have formulated theoretical models that give emotion a causal role in human functioning (Greenberg & Safran, 1987; Mahoney, 1991, 1995; Zajonc, 1980). Among the most comprehensive is the dialectical constructivist model described by Greenberg and Pascual-Leone (1995). These authors have articulated an epistemology integrating affective and cognitive functioning, and corresponding processes of personal change. These change processes focus on the evoking, restructuring, and modification of basic psychological units referred to as "emotion schemes." Schemes are described as active units carrying domain-specific information (cognitive, affective, etc.) depending on their location (e.g., prefrontal or limbic regions), which seek to "apply and to assimilate situations to their structure, even under minimal conditions of satisfaction of degree of fit" (p. 172). Greenberg and Paivio (I 997) elaborate:

> A scheme involves a set of organizing principles, constructed from the individual's innate response repertoire and past experience, that interact with the current situation and generate current experience. Schemes are highly personal and idiosyncratic, laden with emotional memories, hopes, expectations, fears, and . . . involve a complex synthesis of affect, cognition, motivation, and action. (p. 3)

Two personal change processes that have been described by this model are emotional restructuring and modification (Greenberg & Pascual-Leone, 1995; Greenberg & Safran, 1987, 1989). Emotional restructuring involves facilitating a synthesis of new structures by coactivating existing and newly formed schemes, which leads to the creation of novel meanings and emotional responses. During this process, the therapy situation serves as an external con-

straint that presents cues and resistances for the activation and inhibition of schemes. Emotional modification involves evoking emotional schemes and exposing them to novel input, thus altering the organization of the scheme. In this process, problematic cognitive-affective networks can be modified as new information is added to the current response that has been evoked.

The change processes described by Greenberg & Pascual-Leone (1995) rely on experiential activation and modification of affect. Affective experiencing is often precognitive and nonverbal (Greenberg & Safran, 1987, 1989; Zajonc, 1980), and therefore, alternative forms of nonverbal media often provide optimal means to accessing and modifying the affective system (Rachman, 1981). The literature documenting the therapeutic use of music points to one such medium.

Music in Therapy

> "My own view, now supported by recent experiments . . . is that music offers a more effective means of modifying the affective system (Sutherland et al., 1981). It may be more effective than the visual memory system, which according to Paivio (1978), is more congruent with affect than is the verbal cognitive system. If my prediction is borne out, we will need to learn more about the processing of music stimuli and why they can feed into the affective system with relative ease." (Rachman, 1981, p. 282)

Rachman's early hunches concerning the ease with which music enters the affective system have been well supported by a body of literature documenting the mood-modifying properties of music. Some of the earliest interest in the mood modifying qualities of music was stimulated by the need for reliable mood induction methods for clinical research. Investigators examining mood-induction consistently found music-based mood induction procedures (e.g., passive listening of preselected music) to be more effective in modifying mood than other commonly used techniques such as the Velten Induction Procedure, which involves having subjects read 20 of 60 self-referential statements designed to induce either an elated, neutral or depressed mood (Albersnagel, 1988; Piagnatiello, Camp, Elder, & Rasar, 1989; Sutherland, Newman, & Rachman, 1982).

A review of the existing literature addressing the use of music in therapy suggests that cognitive interventions may be enhanced by

adding a music component. It may be that the addition of music introduces an affective modification component to treatments whose therapeutic action were originally operating in a purely top-down fashion (i.e., emotional change as a byproduct of cognitive restructuring). For example, Sutherland et al. (1982) found that intrusive thoughts were more easily removed when the subjects' moods were affected positively by music listening. Eifert, Craill, Carey, and O'Connor (1988) investigated music-based evaluative conditioning effects in the treatment of subjects with animal phobias. Results indicated that decreases in fear and dislike as well as positive changes in the evaluation of the feared animals were significantly greater in exposure sessions with music than in sessions without music. Russell (1992) compared the efficacy of tape recorded cognitive behavioral, music, imagery, and music and imagery techniques in the treatment of anxiety. The findings revealed that the music and imagery treatment was the most effective in reducing State and Trait anxiety.

Music-assisted cognitive behavioral techniques have relied heavily on the use of music to pacify or relax the affective system (Rider, 1985; Robb, Nichols, Rutan, Bishop, & Parker, 1995; Russell, 1992). Unfortunately, there are no adequate examples of the use of music to stimulate emotion, as would occur in emotional restructuring, as described by Greenberg and Pascual-Leone (1995). Interestingly, results supporting the anxiety reducing effects of music may have actually been relying, in part, on emotional stimulation; however, this was not an a priori assumption in any of the studies, and therefore efforts were not made to measure such an effect.

One technique that could potentially benefit from the mood stimulating properties of music is reframing. The reframing process is typically facilitated in top-down fashion, in which the therapist or client generate new (positive) cognitive understandings or "frames of reference" for a given situation or experience. Any emotional change is understood as a consequence of shifts made in the client's cognitive awareness. Research has demonstrated that, in its many versions, reframing is effective in treating an array of populations, with a variety of problems (Kraft, Clairborn, & Dowd, 1985; Swoboda, Dowd, & Wise, 1990).

The primary aim of the present study is to compare two structured versions of reframing (Cormier & Cormier, 1991), one music-assisted and one not, in which subjects generated new schemes

and altered old schemes in an effort to reframe their experience of a situation that caused them anxiety. The study addressed four questions. First, it examined whether a music-based cognitive reframing technique would be more effective in reducing anxiety than a standard cognitive technique. Second, the study examined whether subjects who listened to music would experience greater positive mood changes than subjects who did not listen to music. Although music has been used successfully to modify mood, it is presently unclear whether or not music can be used to induce positive mood change in the context of therapy. The existing literature addressing the use of music in therapy has produced inconsistent findings concerning the use of music to promote imagery vividness. Therefore, the third question addressed was whether subjects in a music-assisted reframing group would report greater imagery vividness than subjects in a standard reframing group. Finally, because there is limited support for the use of music to modify affect, this study also examined whether or not subjects who listened to music would experience greater affective modification (indicated by self-reported changes in the affective experience of anxiety in a particular situation) than subjects in a standard reframing group.

Method

Participants

Forty adults (12 men, 28 women) were recruited for the study. All subjects experienced anxiety in particular situations, and met or passed the State-Trait Anxiety Inventory (Spielberger, 1983) pretest cut-off score of 40 (approx. 70th percentile depending on gender). This cut-off score has been used successfully in previous research to select 'anxious' subjects (Russell, 1992). The mean age for the sample was 27.25 years. Thirty-four of the subjects were university or college students at the time of participation. The remaining six were either employees at a university or college, or were working elsewhere. Once a subject was found to be eligible for participation, he or she was assigned randomly to one of two treatment groups: (a) reframing or (b) music-assisted reframing.

Instruments

Three standardized and two unstandardized measures were used in this study. The State form of the State-Trait Anxiety Inventory

(STAI, Spielberger, 1983) and the Beck Depression Inventory (BDI) were used to assess eligibility for participation and ensure that the two groups were initially equal in terms of level of anxiety and depression. The STAI and the State Trait–Depression Adjective Checklist (ST-DACL, Lubin, 1981) were used to measure pre to posttreatment changes in anxiety and mood respectively. Two unstandardized measures, the Subjective Units of Distress Scale (SUDS) and a Think-Aloud method (Genest & Turk, 1981) were also used to assess change. The SUDS was used to measure self-reported levels of anxiety at pre and posttest, and the Think-Aloud method was used to measure imagery vividness and self-reported cognitive, affective, and physiological reactions.

The STAI was used to measure changes in anxiety from pre to posttreatment. State anxiety refers to transitory emotional reactions to a specific stimulus. The internal consistency range of the State-Anxiety is .86 to .95 across both female and male samples of working adults, military recruits, and college and high school students. Test-retest intervals range from one hour to 104 days. The magnitude of the of test-retest reliabilities decreased as a function of interval length (Russell, 1992), with the State scale coefficients ranging from .16 to .62. The low State reliabilities are understandable given that the instrument is designed to assess transitory anxious states, which may be, at any time, mediated by an array of situational factors. Alpha coefficients for State scale scores among working adults of three age groups ranged from .89 to .96.

The ST-DACL was used to assess changes in mood from pre to posttreatment. The ST-DACL is a self-report instrument designed to measure both transitory and more stable depressive moods. Beckingham and Lubin (1991) reported data on three types of reliability for this instrument. The internal consistency alpha coefficient (alphas) ranged from .81 to .86 across two age groups and across ST-DACL E, F, and G. On split-half reliability, coefficients ranged from .74–.87 for adults, and from .82–.89 for elderly adults. Alternate form reliability of the three lists for two age groups indicates that the means of the intercorrelations for each age group are identical (.84).

The SUDS was used to measure changes in self-reported anxiety from pretreatment to posttreatment. This scale is a simple nonstandardized measure of anxiety. Typically, the scale ranges from 0–100, with 0 representing complete calmness and 100 represent-

ing extreme discomfort and clients are simply asked to indicate verbally their level of anxiety on the imaginal scale at a given moment.

A Think-Aloud method (Genest & Turk, 1979) was employed to explore whether or not subjects in the music-based reframing group would report more positive affective reactions and greater imagery vividness than members of the control group. Short portions of the treatments were audio-recorded during each session, and transcripts of these recordings were rated. Two raters were trained to indicate the incidence of four types of statements made by subjects following visualizations in the treatment procedure. Three categories were classified as client reactions: affective reactions (e.g., I am happier), cognitive reactions (e.g., I think I speak well), and physiological reactions (e.g., my body feels less tense). The fourth statement category was used to assess imagery vividness, and included any statements that described neutral details of the scene the subject was imagining (e.g., there are flowers on the desk). Raters read through each transcript and labelled each descriptive statement, affective, cognitive, and physiological reaction. The Think-Aloud measure was easily incorporated into this procedure as each subject verbally identified new reframes as part of the procedure. Consequently, no additional instructions were required, although all subjects were informed in advance that portions of the treatment would be recorded. Genest and Turk (1981) have indicated that many of the commonly cited problems with Think-Aloud approaches are eradicated when judges are asked to indicate the presence or absence of simple forms of content on cassette recordings.

In order to obtain an interrater reliability coefficient for Think-Aloud transcript ratings, both judges rated 10 mock cases (25% of total number of cases) in transcript form. Each case contained 15 statements (the mean number of statements in the actual data). Analysis of independent raters' reliability showed an agreement of 92%. Raters were then given five cases from the pool of subject transcripts, and interrater reliability was found to be 88%.

Procedures

Prior to treatment, subjects were asked to complete, in the following order, the State portion of the STAI, the BDI, the ST-DACL, and the Subjective Units of Distress Scale. Subjects typically took between 5 and 10 minutes to complete the measures. Subjects' descriptions of "thoughts, feelings, and sensations" experienced dur-

ing the second set of visualizations were tape-recorded as part of the Think-Aloud measurement. After the treatments had been administered, subjects were instructed to complete the STAI, the ST-DACL, and asked to give another SUDS rating. The measures taken at posttest were presented in counterbalanced order across subjects (within groups).

Both the reframing and music-assisted reframing groups received treatments that were adapted from the reframing method described by Cormier and Cormier (1991, p. 438). The method closely follows standard cognitive behavioral reframing procedures as subjects were verbally guided through a series of short visualizations in which they were asked to imagine the anxiety-provoking scene and notice their "thoughts, feelings, and sensations." Once a visualization was completed, subjects were asked to report what they had noticed. Following this initial step, subjects in the music-assisted reframing group then listened to 5 minutes of music that initially matched the mood of the subjects (i.e., anxiety), and then became increasingly positive in mood quality. Subjects in the standard reframing group did not listen to music. All subjects then completed another series of short visualizations in order to identify other neutral and/or positive thoughts, feelings, and sensations that are not typically attended to in the anxiety-provoking situation. In other words, both groups received identical interventions, except the music-assisted reframing group listened to music prior to identifying neutral or positive thoughts, feelings, and sensations in the situation. Brief instructions were given prior to the start of the music: "Now, I would like you to quietly listen to a tape of recorded music for approximately 5 minutes, and then I will ask you to repeat the imagery."

The music consisted of 1 minute and 10 seconds of Offenbach's *Barcarolle* from *The Tales of Hoffman,* followed by *Morning* from *Peer Gynt* by Grieg (3 minutes & 30 seconds). The first piece of music was chosen to match the anxiety the listener was experiencing as a result of visualizing an anxiety-provoking event. The second piece progresses gradually from a neutral mood quality to a more elated mood quality. This ordering is in accordance with the entrainment effect described by Rider (1985), which states that unpleasant mood and/or physiological states are more easily affected by elating or relaxing music if the music is first preceded by a selection that matches the initial unpleasant state. The Offenbach piece was

TABLE 1

Pretest Mean, SD, t-*test and* p *Values of Descriptive Variables for Experimental and Control Groups* (N = *40)*

	Experimental		Control			
Variable	*M*	*SD*	*M*	*SD*	*t*	*p*
Age	28.25	7.55	26.25	6.43	0.90	.37
BDI	16.00	8.17	15.60	7.06	0.16	.87
STAI	82.15	5.54	81.45	6.49	0.37	.72
SUDS	80.95	10.24	76.00	16.82	1.12	.27
ST-DACL	54.10	9.28	58.65	6.10	–1.83	.08

initially selected by the researcher, a music therapist, and an expert in the field of musicology. The Grieg piece has been used in previous research and found to promote positive affective states and decrease phobic responses (Eifert et al., 1988). However, to gain convergent validity, the author had two expert raters (two experienced music therapists) rate the mood content of the pieces. The rating involved indicating on a Likert scale, the mood of the music at several points during the piece. The Likert scales were adapted from Mayer, Allen, and Beauregard's (1995) factor analyzed mood scales. Results of the ratings indicated that the music closely adhered to the entrainment principle.

Results

Descriptive Statistics

The final sample contained 40 subjects (12 men, 28 women) aged 19 to 44 years (M = 27.25 years, SD = 6.99 years). STAI scores collected prior to intervention produced a standard score mean of 81.8 (SD = 5.97), while the mean for the pretest SUDS scores was 78.48 (on a scale of 0–100; SD = 13.97). ST-DACL scores yielded a standard score mean of 56.38 (SD = 8.09).

All subjects were randomly assigned to either the experimental condition (music-assisted reframing) or the control condition (reframing). To ensure that the two groups were initially equivalent, a series of t-tests was calculated. Descriptive statistics for each group are presented in Table 1. A two-sample t-test revealed no significant differences between the groups in age (t (38) = 0.9, p = .37). On measures of anxiety, the STAI (t (38) = 0.37, p = .72) and SUDS (t (38) = 1.12, p = .27) no significant differences between groups were

TABLE 2

Mean, SD, t *and* p *Values of STAI, SUDS and ST-DACL scores, Affective Reactions, Cognitive Reactions, Physiological Reactions, and Descriptive Statements for Experimental and Control Groups* (N = *40)*

Variable	Experimental		Control			
	M	*SD*	*M*	*SD*	*t*	*p*
STAI	55.40	13.50	71.85	11.28	−4.18	.001
SUDS	40.75	14.35	58.25	15.15	−3.75	.001
ST-DACL	49.50	5.25	53.95	6.00	−2.50	.01
Affective reactions	3.35	1.66	.85	1.34	5.22	.001
Cognitive reactions	11.5	5.98	7.85	3.96	2.54	.01
Physiological reactions	1.1	1.37	0.35	0.67	2.20	.03
Descriptive statements	5.1	3.81	2.75	2.44	2.32	.02

detected. Finally, the measure assessing mood at pretest, the ST-DACL, also showed that the groups were statistically equivalent (t (38) = −1.83, p = .08).

A series of two sample t-tests was used to determine if the groups differed at posttest on the dependent measures, including the variables measured in the Think-Aloud transcripts. Results of the t-tests revealed significant differences on all dependent measures. Both groups showed reductions in anxiety at posttest, however, significant group differences favoring the experimental group were found on both measures (STAI, t (38) = −4.18, p = .01; SUDS, t (38) = −3.75, .001). Significant differences between groups were also found for mood change (ST-DACL, t (38) = −2.50, p = .01). Again, the difference favored the experimental group. Group posttest means, standard deviations, and t-test results for STAI, SUDS, and ST-DACL scores, and Think-Aloud variables are presented in Table 2.

A series of t-tests was used to determine if differences existed between groups in number of affective, cognitive, and physiological reactions reported by the subjects. This was done primarily to determine if the experimental group experienced more affective modification (i.e., reported more affective reactions) than the control group. Results revealed significant differences favoring the experimental group on all variables in the Think-Aloud transcripts (affective reactions, t (38) = 5.22, p = .01; cognitive reac-

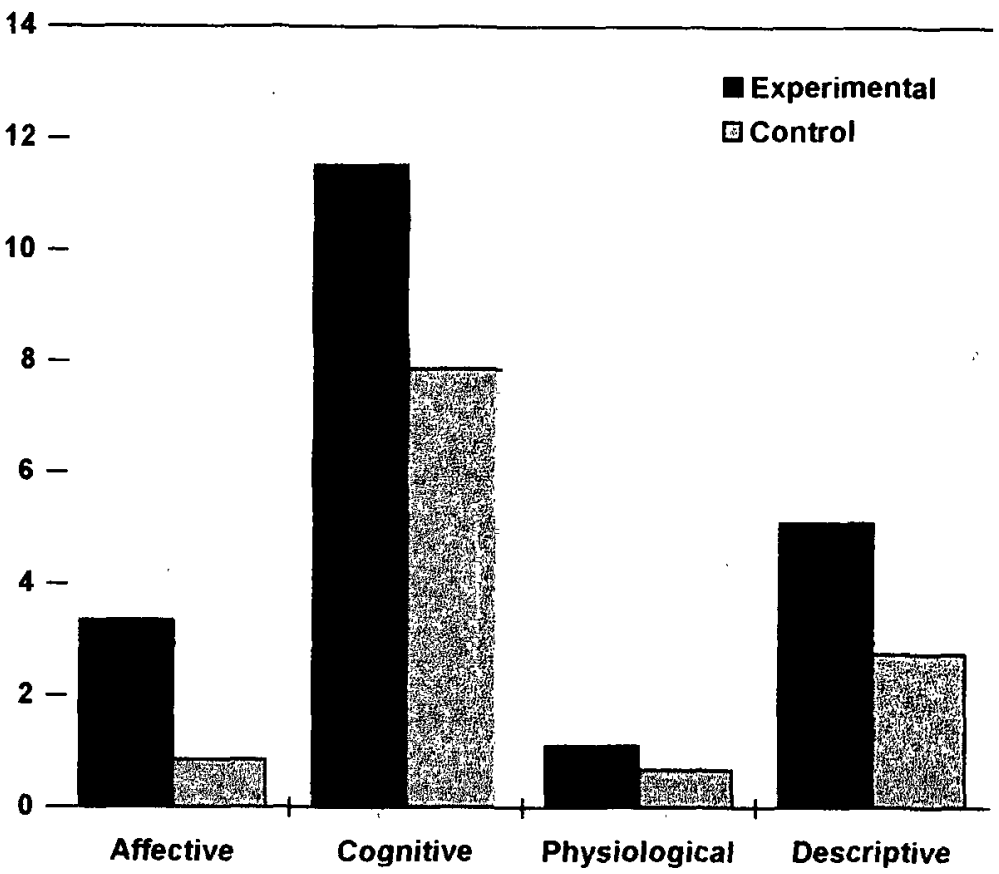

FIGURE 1.
Means of the types of Think-Aloud statements for experimental and control groups.

tions, t (38) = 2.54, p = .01; and physiological reactions, t (38) = 2.20, p = .03).

Another t-test was used to examine whether the two groups differed in the number of descriptive statements used. This analysis served to reveal whether or not there were differences in the degree of imagery-vividness experienced in the two groups. Results indicated that there were significant differences in the number of descriptive statements made by each group (t = 2.32, p = 0.026). Again the difference favored the experimental group. The mean number of types of Think-Aloud statements for the experimental and control groups are presented in Figure 1.

A Pearson correlation matrix (involving all subjects) was em-

TABLE 3

Intercorrelations Among Selected Posttest Dependent Measures (N = 40)

Measure	1	2	3	4	5	6	7
1. STAI	—	.60**	.64**	−.60**	−.37	−.53**	−.12
2. ST-DACL	—	—	.44	−.60**	−.40	−.22	−.32
3. SUDS	—	—	—	−.40	−.31	−.19	−.18
4. Affective reactions	—	—	—	—	.51**	.19	.18
5. Cognitive reactions	—	—	—	—	—	.22	.05
6. Physiological reactions	—	—	—	—	—	—	.21
7. Descriptive statements	—	—	—	—	—	—	—

* $p < .05$. ** $p < .01$.

ployed to determine whether there were significant relationships between dependent measures. The correlations of interest included: a positive correlation between posttest STAI and posttest SUDS scores ($r = 0.64$, $p < .01$); a positive correlation between posttest STAI and posttest ST-DACL scores ($r = 0.60$, $p < .01$); a negative correlation between posttest STAI and Affective Reactions ($r = -0.60$, $p < .01$); a negative correlation between posttest STAI and Physiological Reactions ($r = -0.53$, $p < .01$); a negative correlation between posttest SUDS and Affective Reactions ($r = -0.40$, $p < .01$); and a positive correlation between Cognitive Reactions and Affective Reactions ($r = 0.51$, $p < .01$). The posttest correlations are summarized in Table 3.

Discussion

An important finding of the study was that subjects in the music-assisted reframing group experienced greater anxiety reduction than subjects in the reframing group. This result was consistent across both measures of anxiety (i.e., the STAI & SUDS). Further, a significant difference on mood measures favoring the music-assisted reframing group was observed. These findings are consistent with a dialectical constructivist model of emotional restructuring, that implies that music served the function of stimulating emotion schemes already within the subject's repertoire. These schemes, integrating affect and cognition, then became synthesized and reorganized in consciousness to form new (affective and

cognitive) experiences and understandings of the anxiety-provoking situation. This in turn led to increased reductions in anxiety, and positive mood change. Examples of these dynamic syntheses, reorganizations, and the resulting new understandings were evident in the Think-Aloud transcripts. During a music-assisted reframing procedure one subject with public-speaking anxiety reported: "I feel much more peaceful and comfortable in my body . . . I'm actually feeling enthusiastic about imparting my knowledge of what I have learned, and I'm interested in this stuff, which is why I'm doing it, cause I like it."

The explanation of music as a stimulator of schemes is consistent with Bower's (1981) theory of associative memory networks. Bower's theory states that stimuli present cues for the activation of schemata, which are then encoded in memory to form new associative connections. In this study, positive sounding music served as a stimulus that activated positive schemes, which were collectively encoded in memory, and then later incorporated in novel descriptions of the anxiety-provoking situation. Further support for this explanation comes from the experimental literature on affect, music, and memory (Teasedale, 1983) which states that music itself is often an integral part of a large associative memory network. It follows that in order to become a part of an associative memory network, music must first be capable of activating and reorganizing schemata.

Another important finding was that subjects in the music-assisted reframing group reported more (positive) affective reactions than subjects in the standard reframing group. In light of this, it could be concluded that music may have served the additional function of modifying the negative affect that had been aroused during the initial visualization of the anxiety-provoking situation. Consistent with the dialectical constructivist model of affective modification, it is suggested that as subjects were experiencing anxiety, the music served to stimulate new information that was integrated into the emotion scheme, thus altering its organization. Pascual-Leone (1991) stated that primary affects are comprised of four dialectical constituents—"a main (or identity) constituent transformation and three regulating transformations . . . logical negation (or inverse), dialectical negation (or reciprocal), and supplementary (or correlative) transformation" (p. 319). The main constituent, in this case anxiety and fear, may have been regulated or transformed by way of logical negation and dialectical negation. In other words, music

stimulated affective schemes that served to undo (logical/inverse negation) or cancel (dialectical/reciprocal negation) the experience of anxiety. This in turn may have had a positive effect on all other processes mentioned previously—positive affective reactions, scheme synthesis, mood change, and imagery-vividness—as negative affect was no longer constraining these processes. Another Think-Aloud transcript example illuminates the affective modification effect: " I feel more stable and more grounded, I feel quite relaxed, which is so odd . . . didn't have that any of that hot and cold stuff, I was just standing there".

Subjects in the music-assisted reframing group experienced greater imagery-vividness than subjects in the standard reframing group. This finding was evident given the significant difference between the groups in the number of descriptive statements made during the Think-Aloud portion of the treatment. Once again, music seemed to stimulate the activation of schemes in consciousness, which in turn led to new highly-detailed visual scenes. Subjects in the reframing group did not listen to music, resulting in fewer new schemes being activated, and a small amount of visual detail compared to the music-assisted reframing group. This finding is consistent with previous research that found that music stimulates imagery-vividness (Bonny & Savary, 1973).

Some additional, unanticipated effects were also found. First, a strong relationship between affective modification, as measured by affective reactions, and reductions in anxiety was found. This relationship was evident given that both measures of anxiety were negatively correlated with affective reactions (STAI: –.60; SUDS: –.40). This finding may be explained by the fact that the modification of affect potentially serves three functions in treatment process. First, negative affect is considered to be a large component of anxiety (Lazarus, 1966; Spielberger, 1972), and therefore modifying it (to a positive end) should greatly diminish anxiety. Second, it is suggested that the stimulation of positive affect will boost cognitive-congruent schemes (Greenberg & Pascual-Leone, 1995), and the generation of positive cognitions has been found to be an effective means of reducing anxiety (Beck, 1979). Third, affective modification was found to be significantly related to positive moods (much more so than physiological and cognitive reactions) after the treatments had been completed, and positive mood states would most likely increase subject compliance and motivation.

Another finding of interest concerns the observed relationship between affective and cognitive reactions ($r = 0.51$). It appears that increases in the number of affective reactions were related to increases in cognitive reactions. This finding echoes the complex affect-cognition relationship described by other researchers and theorists. The relationship is also consistent with constructivist theories that view affect and cognition as being engaged in a reciprocal-causal relationship (Greenberg & Pascual-Leone, 1995; Mahoney, 1991; Mahoney & Lyddon, 1988).

Although the results found here are encouraging, much additional empirical and methodological work is needed. One methodological issue concerns the music that is used in studies of the type reported here. It is not currently known what type of music is most effective for therapeutic purposes and how it is best selected. Some researchers have found that the client selection serves as the best guide to music that will be effective in the context of therapy (Thaut & Davis, 1993), while other researchers have found client preferences to be inadequate, especially when compared with therapist/researcher selections (Rider, 1985). Additional research should clarify these issues.

Further research is needed to determine the means by which music stimulates affect and promotes relaxation. Considerable research has been done on the neuropsychological and more general physiological processes that occur in response to music stimuli (Scartelli, 1991; Spintge, 1991); however, further research is needed to determine exactly how music modifies and promotes positive affective states. None of the measures used in the present study were fully capable of assessing such a phenomenon. As well, past research has found inconsistencies in subject response to music when responses are measured by self-report and physiological measures such as heart rate, blood pressure, and galvanic skin response. It seems that listening to sedative music can in fact induce physiological arousal while simultaneously prompting decreases in self-reported anxiety (Hanser, 1985; Jellison, 1975; Robb et al., 1995; Thaut, 1989). Because physiological measures can track responses unique from those captured by self-report indices, future studies like the one presented here should include physiological measures. Furthermore, while the results of the study suggest that music can increase imagery-vividness, it is not known with certainty whether or not music can serve this purpose. More sophisticated

measures of imagery-vividness may provide more conclusive evidence.

The success of the music-assisted intervention indicates that music may be effectively used to promote emotional change and enhance traditional cognitively-focused interventions. However, care should be taken to evaluate what type of music is most appropriate for the particular intervention to be used. The music therapy literature may serve to provide some general answers to these questions; however, ideally, future research will reveal the type of music that is best for each type of intervention.

Emotional experience is at the heart of many of the problems that bring people to therapy. An understanding of these experiences and the corresponding change processes is a prerequisite to successful intervention. Two potent human change processes involve the modification of maladaptive affect, and the stimulation of new conscious experience. Music may serve as an invaluable tool in the pursuit of these therapeutic gains, and therefore, research exploring the relationship between music and emotional experience will only serve to enhance theory and practice.

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