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The Relationship Between Music, Degree of Liking, and Self-Reported Relaxation

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The role of music in relaxation was examined by having subjects rate their level of relaxation after 15 minutes of either listening to one of five types of music or sitting in silence. Subjects also rated the pleasurable quality of the experience, ability to empty the mind, and liking of the music. No single type of music was found to lead to significantly more relaxation; however, atonal music produced significantly less relaxation. The most important factor in relaxation was the degree of liking for the music; significant correlations occurred between liking and relaxation, pleasure and not thinking. Individual preferences must thus be considered when using music to aid relaxation; precategorized soothing music may not always be soothing.

Music has long been used to facilitate relaxation. However, studies examining the effects of music on various physiological measures of relaxation have achieved mixed findings. Zimny and Weidenfeller (1963) found that music had no effect on heart rate, while galvanic skin response (GSR) increased during exciting music but showed no difference between neutral and calming music. Barger (1979) likewise found that music did not affect heart rate when compared with silence and verbal suggestions to relax. Peretti and Swenson (1974) found that music reduced anxiety as measured by the GSR; this effect was strongest for music majors. Miller and Bornstein (1977), who compared four relaxation methods with and without music, reported that music was not beneficial as measured by an elec-

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tromyogram (EMG). Also using EMG recordings, Sears (1960) demonstrated that music can affect muscle tension in accordance with music type (stimulative or sedative). Borling (1981) found no difference in alpha wave production between stimulative and sedative music treatments, while Furman (1978) reported that only subjects who were children produced more alpha waves during silence than during two different music conditions. These studies represent only a sample of the extant research examining physiological responses to music; Dainow (1977), who reviewed and summarized the results of such studies, found no clear relationship between music and heart rate, respiration rate, GSR, or EMG.

Other studies have used more subjective measures of anxiety and relaxation, such as scales and questionnaires. This procedure is justified by several researchers who have suggested that music does not directly affect physiological responses. Smith and Morris (1976) played music during a test-taking session and subsequently questioned subjects on worry, emotionality, expectancy of performance, concentration, and liking of the music. These researchers concluded that music affects the cognitive component of anxiety more than it does the affective component. Gabriel and Crickmore (1977) even stated that "emotion" is too strong a word for use in describing reactions to music; they suggested that music causes "as if" emotions, and they alternatively emphasized the role of cognition. Thus, measures of "cognitive" relaxation might be expected to yield better results than physiological measures. However, inconsistencies still exist among studies and, in the common paradigm of comparing stimulative and sedative music, precategorized sedative music is not necessarily the best or only condition for relaxation. Using a questionnaire, Smith and Morris (1976) found that both sedative music and no music conditions yielded a decrease in anxiety. In a second study, Smith and Morris (1977) concluded that stimulative music increases anxiety more than sedative music decreases anxiety. Using only high-anxiety subjects, Rohner and Miller (1980) reported that, while sedative music decreased scores on the Eight State Questionnaire (which measures state anxiety) slightly more than did stimulative music or silence, the differences were not significant. Using anxious subjects and the State-Trait Anxiety Inventory, Stouden-

mire (1975) found that both relaxing music and muscle relaxation instructions helped reduce state anxiety, with the muscle relaxation group showing a somewhat greater decrease. Biller, Olson, and Breen (1974) found that "sad" music decreased state anxiety while "happy" music increased such anxiety; they made no comparison, however, between "sad" and "happy" music and sedative and stimulative music.

The procedure of comparing precategorized music is prevalent in the research on music and relaxation, with sedative and stimulative being the two most common categories. This is apparently based on the assumption that all subjects will react uniformly to a given type of music. Taylor (1973) has warned, however, that music should only be classified as stimulative or sedative after its effects on the listener have been determined, since all subjects do not respond identically to a musical selection. Taylor's caution implies, however, that for each individual some type of music will assist relaxation.

What, then, makes a particular musical selection relaxing for a particular individual? To begin to answer this question, the present study examined several subjective responses to various types of music presented in a relaxing context.

Method

Subjects

The subjects were 36 college freshmen and sophomores (15 males, 21 females) who were enrolled in an introductory psychology course; all volunteered and received extra course credit. Subjects were assigned to one of the six conditions at random, resulting in six subjects per condition.

Procedure and Materials

All subjects were taken individually to a small office-type room furnished with a desk, bookcase, and several chairs. The subject was asked to sit in a comfortable arm chair and to relax and try not to think about daily problems or concerns. Subjects were told to empty their minds for the next 15 minutes, and were invited to put their feet up and turn off the lights if they wished. For subjects participating under the music conditions, a cassette tape player was then turned on at an intensity level

of 45–50 dB, and the experimenter left the room. After 15 minutes, the experimenter returned, turned off the tape player and gave the subject a questionnaire to complete. The questionnaire required the subject to rate on a scale of 1–7 the following questions: How successful were you at emptying your mind—that is, not thinking? How relaxed did you feel during this 15 minutes? How pleasurable was this experience? On a scale of 1–10, subjects in the music conditions were also asked to rate how much they liked the music. Two additional subjective questions were included asking the subjects whether they did anything specific to relax and prevent themselves from thinking, and for those subjects in the music conditions, how the music influenced them. Several choices were presented with these questions with space for other responses.

Of the six comparison groups, five heard music and one group sat in silence. The types of music and selections used for the music groups were as follows: (a) soothing classical—Haydn's *Surprise Symphony*, second movement; Haydn's *String Quartet*, second movement; Mozart's *Symphony #40*, second movement; and Mozart's *Symphony #41*, second movement; (b) stimulating classical—Mozart's *Symphony #40*, fourth movement; Mozart's *Piano Concerto*, third movement; Mozart's *Symphony #41*, fourth movement; and Haydn's *Surprise Symphony*, fourth movement; (c) romantic—Grieg's "Anitra's Dance" from the *Peer Gynt Suite;* Bizet's opera *Carmen*, second intermezzo; Saint-Saens' "The Swan" from *The Carnival of the Animals;* and Schumann's "Traumerei" from *Scenes from Childhood;* (d) atonal—Schoenberg's *Variations for Orchestra*, Opus 31; (e) easy listening—Muzak demonstration record with instrumental arrangements of "Kiss Me in the Rain," "Daydreamer," "I Don't Want to Walk Without You," "Sailing," "Magic," and "Fame."

Results

Table 1 shows the mean rating given to the questions on not thinking, pleasurable quality, relaxation, and liking of the music for each treatment condition. An analysis of variance revealed no significant differences between conditions for the measures of not thinking or for the pleasurable quality of the experience. A significant effect was found (F [5, 30] = 3.69,

TABLE 1
Mean Ratings on Four Scales by Subjects in All Music Conditions

Scale	Condition					
	Soothing	Stimulating	Romantic	Atonal	Muzak	Silence
Not thinking	4.67	3.67	4.50	4.00	4.50	3.83
Pleasurable	4.67	5.50	5.83	4.83	5.83	5.33
Relaxed	5.66	6.33	6.33	4.83	5.57	6.17
Liked music	7.20	6.80	8.60	5.25	7.67	—

Note. The first three scales had a range of 1–7 while liking for the music was rated on a scale of 1–10.

$p < .01$) for the measures of subject relaxation. Multiple comparisons were made using the studentized range statistic, q (Hopkins & Glass, 1978). The atonal music subjects felt significantly less relaxed than did those listening to romantic music ($q = 4.92$, $p < .05$), stimulating music ($q = 4.92$, $p < .05$), and no music ($q = 4.39$, $p < .05$). No other significant differences were found between conditions. A significant F was also found for liking of the music (F [4, 20] = 3.025, $p < .05$), with atonal music liked less than romantic ($q = 4.72$, $p < .05$). Again, no other differences were revealed between the other types of music.

Pearson product-moment correlations were also performed to examine the relationships among the variables. As seen in Table 2, the degree to which the subjects liked the music achieved a high positive correlation with the other three variables, especially relaxation. Relaxation was only moderately related to the pleasurable quality of the experience and was not related to subjects' ability to clear their minds.

Subjects ($n = 12$) who rated their liking of the music at one of the top three ranks (8, 9, or 10), were compared with the subjects ($n = 7$) who rated their liking of the music at the three lowest ratings chosen (4, 5, or 6). Both of these groups were also compared with the no-music group. Subjects who liked the music the most had a mean relaxation score of 6.33, while those who liked it the least had a mean score of 5.0. A significant F was found in comparing these two groups with the no-music group (F [2, 22] = 6.763, $p < .01$). Subjects who liked the music the most were significantly more relaxed than were the subjects

TABLE 2
Correlations Between Four Scales

Scale	Scale		
	Pleasurable	Relaxed	Liked Music[a]
Not thinking	.304	.313	.670***
Pleasurable	—	.408*	.604**
Relaxed	—	—	.733***

[a] This column includes only subjects in the five music conditions.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

who liked the music the least ($q = 5.04$, $p < .01$). Subjects who liked the music the most did *not* report significantly more relaxation than did subjects in the no-music group ($q = .578$, $p < .05$); however, subjects who did not like the music reported significantly less relaxation than did the no-music subjects ($q = 3.786$, $p < .05$).

In response to the subjective questions, 70% of all subjects in the music conditions said that the music helped them relax (79% exclusive of the atonal condition), and none said the music made them tense. The presence of the music made it easier to clear the mind for 53%, and 43% said the music helped produce images. Imagery was reported by 44% of all subjects during the session, 53% reported emotions, and 22% said that when they were not thinking, their minds were completely blank. Other responses given by a few subjects as ways in which they prevented thinking included concentrating on the music, counting breaths, trying to fall asleep, picturing a blank piece of paper, and focusing on one spot.

Discussion

In comparing the effects of five different types of music on various subjective reactions, this study found that only atonal music was liked significantly less and led to significantly less relaxation than did other types of music. No single type of music was most effective in aiding relaxation, and no significant differences were found between soothing and stimulating music. Subjects varied in the degree of relaxation they experienced, and the single factor most closely related to relaxation

was degree of liking for the music. Even omitting the atonal music subjects, who contributed most heavily to this relationship, the correlation between liking and relaxation was .645 ($p < .01$). Additionally, subjects who liked the music comparatively more reported greater success at clearing their minds and more pleasure in the total experience. These findings support those of Smith and Morris (1977), who found that liking of the music correlated positively with performance, expectancy, and concentration, and negatively with worry and emotionality.

These results also support Taylor's (1973) contention that precategorizing music is risky since people react to music in a highly individualized manner. Of course, certain types of music may have uniform effects on groups of individuals for behaviors other than those measured here. Other studies have found that music has general group effects related to industrial efficiency (Fox, 1972; Kerr, 1945), learning (Stainback, Stainback, & Hallahan, 1973), verbal interaction in counseling interviews (Prueter & Mezzano, 1973), and group problem-solving sessions (Stratton & Zalanowski, 1984). Even in the present study, the atonal music manifested a general effect on the entire group. With respect to relaxation, however, the various factors which determine one's liking for a particular type of music, and even a particular selection, must obviously be considered. Using so-called sedative music to facilitate relaxation would be useless if one's past experiences and associations have led to a dislike of that music; as the results of this study indicate, that person would not be able to relax with this music, and might even become more tense than he or she would have without music.

Disappointing but consistent with other findings (e.g., Barger, 1979; Miller & Bornstein, 1977) is the discovery that listening to music which is liked did not promote greater relaxation than did silence. An important point which needs to be investigated further, however, is that subjects were not allowed to choose the kind of music they heard. Verbal attitudinal expressions do not always correspond with behavioral expressions, and reporting a high degree of liking for a type of music does not mean that a subject would necessarily choose that music for listening. Kuhn, Sims, and Shehan (1982), however,

found that the musical selection which was rated the highest among three pieces on a preference scale was also listened to the most when all three selections were available simultaneously. Although these researchers reported a low correlation between the two measures of preference and listening time, the preference scores showed a strong ceiling effect with a great number of subjects choosing the highest rank.

Even if a rating scale of liking provides accurate information about a subject's attitude toward the music, the absence of an opportunity for choice may create some tension. Subjects in the present study were assigned randomly to a music condition, and the range of music used was limited to classical types and "easy listening." Under these conditions, the majority of subjects in the music groups said that music helped them relax. People seem to believe that music is relaxing even when self-report data do not indicate enhanced relaxation. Further study seems warranted using (a) a larger range of music, and (b) free choice of the type of music used.

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