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Improvisational Music Therapy and the Rehabilitation of Persons Suffering from Chronic Schizophrenia

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Persons suffering from chronic schizophrenia characteristically show signs of social withdrawal and emotional flattening. Music therapy, which makes use of spontaneous musical improvisation to establish a nonverbal interaction between therapist and person, encourages persons to develop their interactive capacities. This study shows that patients suffering from schizophrenia who attended a series of individual music therapy sessions improved in their clinical status and in their level of musical interaction with the therapist. The results suggest that music therapy can play a role in the rehabilitation of chronic schizophrenics.

Persons suffering from chronic schizophrenia, besides exhibiting the more florid symptoms of the illness, characteristically show signs of apathy, emotional flattening, poor concentration, impaired tolerance of stimulation, and difficulty with nonverbal and verbal communication (Creer & Wing, 1974; Cutting, 1985; Morgan & Cheadle, 1981; *Psychiatric Working Report*, 1980; Schwartz, 1982). These disabling symptoms predispose to social withdrawal and inactivity, allowing the patient to create the type of low stimulation environment most likely to lead to further deterioration (Wing & Brown, 1970). This cycle of events is just as likely to occur in patients who are living in the community as in patients in the back wards of a bad mental hospital (Brown, Bone, Dalinson, & Wing, 1966). A major aim of re-

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habilitation must be to overcome these disabilities by facilitating and encouraging communication and participation that the patient will tolerate.

Musical activities of various kinds are reported to benefit adult psychiatric patients (Cassidy, 1976; Harris, Bradley, & Titus, 1992; Kahans & Calford, 1982; Williams & Dorow, 1983), while a broad range of activities described as "music therapy" encourage verbal as well as nonverbal responsiveness in withdrawn psychotic patients (Alvin, 1975; Comte, 1984; Lecourt, 1987; Priestley, 1975; Tyson, 1981; Verdeau-Pailles & Bonnefoy, 1986; Vergez, 1984). In spite of the acknowledged value of various approaches to music therapy, a literature search has shown that no study supporting these impressions with objective data has been recorded in the United Kingdom, with the exception of one pilot study that compared the nonmusical behavior of long- and short-stay schizophrenic patients in group sessions (Bunt, Pike, & Wren, 1987). Moreover, two of the studies reporting the beneficial effects of so-called music therapy were based on patients listening to prerecorded music specially selected to induce different moods (Wdowiak, Karczynska, & Pobocha, 1975), and to "background" music and sounds (Vergez, 1984), while another showed significant changes in patients' self-ratings in relaxation, mood, and emotion after having participated in music relaxation, group improvisation and guided music listening (Thaut, 1989).

Music therapy, as conceived in this paper, entails the use of improvisation to establish a one-to-one interaction between therapist and person (Bruscia, 1987; Nordoff & Robbins, 1977; Pavlicevic, 1990, 1991; Priestley, 1975). The active musical participation of the person seems particularly appropriate for a patient group whose apathy and lack of motivation and initiative is well known. In a musical interaction of this type, a "dialogue" develops between the two players: The person meets a musician trained to invite and control musical expressions so that the two players become integrated in a single musical narrative, on one beat and with organized changes of meter, rhythm, and mood. This opens the way for a highly specific mode of communication, one in which the person's musical utterances, no matter how idiosyncratic, come to "make sense" to both players. The person is invited by the therapist to play on a variety of tuned

and untuned percussion instruments that require no musical training, and the therapist joins in with the person's playing by improvising at the piano. The therapist's music reflects and supports the person's use of the musical beat, rhythm, tempo, dynamic level, and melodic shape.

The improvisation between therapist and person is not merely a musical exercise designed to "make the person feel better." Rather, the quality and flexibility of the person's spontaneous musical utterances signal his or her capacity to enter into coherent, sustained, and intimate communication with another person. In the course of a series of regular—usually weekly—sessions, the person is encouraged, by the therapist's interventions, to extend and adapt the range of his or her musical performance. It is hoped that the qualitative improvement in the expression of, and response to, musical patterns and qualities in interaction with a skilled therapist may extend to other areas in the person's life, and lead to a general increase of confidence in interacting with people (Nordoff & Robbins, 1977; Pavlicevic, in press).

In a previous study (Pavlicevic & Trevarthen, 1989), a musical assessment scale which measured the degree of musical engagement was used to show that a group of chronic schizophrenics had greater difficulty organizing their production of sounds and establishing reciprocal musical contact with the therapist than a group of unipolar depressed patients or normal controls. The measures showed that the musical utterances of these patients were frequently so disorganized that the therapist had difficulty supporting and matching them through music improvisation. The schizophrenic patients also had the most difficulty making musical adjustments to facilitate the sharing of the musical performance, and their musical statements and those of the therapist frequently remained unconnected. This may have been the result of the schizophrenic person's incapacity to attend to the musical utterances of another player.

The present study explored whether improvisational music therapy, as used in the assessment study described in the previous paragraph, may play a significant role in the rehabilitation of chronic schizophrenic patients. Specifically, the study examined whether this impoverished capacity for interaction in chronic schizophrenics can be significantly improved over a

series of 10 weekly, individual music therapy sessions; evidence was also sought on whether, as a result, the patients' standard psychiatric ratings, measured independently, were significantly altered.

Methods

Forty-one day hospital attenders took part in the study. Most of the subjects were recruited from Cambridge Street Day Hospital, and the remaining nine subjects came from Morningside Park Day Hospital, in Edinburgh, and from the Day Centre at Herdmanflat Hospital, Haddington, East Lothian, 16 miles east of Edinburgh. Cambridge Street Day Hospital is a rehabilitation Day Hospital of the Royal Edinburgh Hospital, with a patient population of mainly chronic schizophrenic patients, all of whom require ongoing psychiatric supervision. It is staffed by psychiatrists, psychiatric nurses, and occupational therapists, and offers a program of activities tailored to the needs of each patient. These include activities designed to aid the patient's return to work, recreational activities aimed at optimizing patients' use of leisure time, social skills training, training in skills of basic daily living, and the fostering of social interaction. Full use is made of community facilities as well as cultural and recreational facilities.

All subjects were screened and diagnosed as suffering from chronic schizophrenia by a consultant psychiatrist, using research diagnostic criteria derived from the semistructured clinical interview known as the Schedule for Affective Disorders and Schizophrenia (SADS) (Spitzer, Endicott, & Robins, 1978). Any patients suffering an exacerbation of their illness at the time of the study were excluded. Their clinical states were further blindly assessed by an independent rater (the Psychiatric Registrar at the Day Hospital), who administered the Scale for the Assessment of Negative Symptoms (Andreasen & Olsen, 1982), and the Brief Psychiatric Rating Scale (Overall & Gorham, 1962). The Hamilton Depression Rating Scale (Hamilton, 1967) was administered to ensure absence of major depressive features, and subjects with a score greater than 17 were eliminated from the study.

Of the 41 subjects, a Treatment Group of 21 was allocated to weekly individual music therapy sessions, and the remaining

20, constituting a Control Group, received one individual music therapy session at the beginning of the 10-week period and another at the end. The sessions took place at Cambridge Street Day Hospital. The two groups were matched as closely as possible for age, sex, musical experience, social class, duration of illness, musical perception, and psychiatric ratings (Table 1).

Data Collection

Initial session. All 41 subjects took part in a first session, which was recorded on audio and video. The session format is described in the following paragraphs.

First, a brief interview was given to ascertain each subject's previous musical experience and musical background. Questions were asked about the subject's interest in music, whether he or she had ever played an instrument, if tunes were remembered after one hearing, or if he or she was generally affected in mood by listening to music. A simple scoring system was used (Pavlicevic & Trevarthen, 1989); a person with no musical experience would score 1, and an active musician 15. These scores were calculated from interview data by a blind rater.

Subsequently, an improvisation was held with the therapist, using an untuned percussion instrument (a bongo drum) and a tuned percussion instrument (a marimba). Subjects were asked to begin playing, in whatever way they liked, and were told that the therapist would join in and play with them after they had begun. For the bongo improvisation, the therapist played on the piano concurrently with the subject, whereas for the marimba improvisation, therapist and subject took turns to play a musical "conversation" on the same instrument. The latter procedure was adopted for two reasons: (a) it greatly facilitates microanalysis of timing interaction since only one player plays at a time, and (b) it offers subjects the opportunity to hear both their own and the therapist's utterances without accompaniment. During both improvisations, the therapist made alterations of tempo, rhythm, and phrase length, for later analysis of the subjects' responses to such alterations.

Finally, items selected from Luria's Neuropsychological Investigations (Christensen, 1974) were administered. These measured subjects' perception and reproduction of pitch relationships, rhythmic patterns, number of beats, and the use of accents,

and ensured that there were no gross neuropsychological disorders. In this way, musical perception at a basic level was assessed.

Treatment sessions. The Treatment Group then had a series of nine further weekly, individual music therapy sessions, which took the standard form, each lasting approximately 30 minutes. In these sessions, the subjects could choose which instruments they wished to play, in contrast with the initial session described previously. The available instruments included a chromatic xylophone, diatonic metallophone, diatonic marimba, bass drum, side drum, bongos, and cymbal. Attendance was good, with only two subjects in the experimental group dropping out of the study. Each session was recorded on audio tape, to enable the therapist to prepare the following session and to notate any music which appeared especially effective in engaging the patient.

The Control Group had no music therapy or other substitute activity as a control. They attended their second music session at the end of the 10-week period. For both groups, the format of the final session resembled that of session 1.

Methods of Assessment

The Music Improvisation Rating (MIR), developed in the previous study, comprised six levels of musical engagement between Therapist (T) and Subject (P). A modified rating scale, called the Music Interaction Rating for Schizophrenia (MIR(S)) was extended to nine levels, to take into account what appear to be peculiarities of the chronic schizophrenic state. The MIR(S) scale is described in the following section.

Music Interaction Rating for Schizophrenia—MIR(S)

Level 1: no musical contact. P's musical utterances are not sufficiently organized to enable T to match or meet them. P's pulse may be erratic, rhythmic patterns are unformed, and the meter is not well established. The joint improvisation is unsynchronized.

Level 2: P is unresponsive. T is able to meet or match some or all of P's musical statements, even though they may be disordered, e.g., by reproducing the pulse in P's music so that the players have a common pulse. However, when T intervenes

to bring about a musical change, e.g., by altering the tempo or the rhythmic pattern, P continues to play as before, showing no awareness of the change in T's music. The musical contact is thus one-sided; T is making all the adjustments to meet P's music, and P appears unaware.

Level 3: nonmusical response. As for level 2, but when T intervenes, P's response is to stop playing, start talking, look up, or play in a chaotic manner which loses the common beat. Here P shows an awareness of T's intervention, but his/her response is nonmusical and outside the musical relationship.

Level 4: self-directed musical response. P responds to T's interventions, but the content is not directed toward T. That is, the resulting change in tempo or rhythmic pattern or accent does not move toward T but away from her, and effectively keeps her musically on the periphery. This prevents any sustained musical contact between the two players, and is "self" rather than "other" directed. This level is also used to designate improvisations in which T does not intervene but allows P to "do his or her own musical thing," while offering peripheral support. This is done to allow P time to explore the instrument and try out musical possibilities without interference by another.

Level 5: tenuous musically directed response. P's responses to T's interventions show a musical direction of movement towards T's music, but this is as yet unsustained and limited in content. For example, P may speed up in response to T's accelerando but may not sustain this all the way to the musical resolution. This suggests the beginnings of awareness and responsiveness by P of the other partner in a joint musical context.

Level 6: sustained musically directed response. As in Level 5, but P's responses are more sustained. For example, P sustains an accelerando with T all the way through to the musical resolution, as this is dictated through the harmonic or melodic content of the improvisation. P is likely to become over-dependent on T, and to imitate or attempt to imitate everything that T does musically.

Level 7: tenuous mutual contact. P begins to show some musical initiative within the context of the joint interaction. This is different from Levels 2 to 4, where P's inappropriate or nonresponsiveness results in a loss of mutuality. Here, P's initiative is congruent with the preceding shared musical material,

which has musical meaning for both players For example, P may play a basic pulse on the drums while T plays rhythmic patterns, or even syncopations. P does not attempt to follow T's rhythmic and melodic elaborations, and he would most likely lose his or her level of control if he or she tried to do so. But, by holding the basic pulse while T plays, he or she is enabling T to play, while participating in an independent and *related* manner.

Level 8: sustained mutual contact. As in Level 7, but contacts are more sustained. P may begin to initiate changes of tempo which are musically appropriate, may lengthen phrases, may return to an earlier rhythmic pattern, and so on.

Level 9: musical partnership. P and T take turns to lead in a fully mutual musical partnership. This approaches an improvisation in jazz, where the musical material is constantly tossed between the two players, who then extemporize, using the forms they have created together.

These levels comprise an ordinal nine-point scale. For assessment purposes, the improvisations were divided into ten equal blocks of time, and each of these blocks of time was given a single score of one of the nine levels of the MIR(S) scale. This recorded the variation in quality and quantity of the patient's musical engagement or cooperation. From these ten time units, a mean score for each session was calculated. Thus, for example, if in five time blocks (50% of the total improvisation time) the patient scored at Level 3, in two time blocks at Level 4, and in three blocks at Level 5, the total score is, $(5 \times 3) + (2 \times 4) + (3 \times 5) = 38$. This global score was then divided by 10, so that the mean score of 3.8 demonstrates that the patient spent most of the improvisation time engaged at Level 3, moving towards Level 4.

MIR(S) ratings were undertaken, and a second trained musician undertook blind ratings of 23 randomly selected excerpts. Interrater reliability was measured at 0.845 ($p = .0001$)

Results

Group Match

Table 1 shows that the groups were matched for age, gender, duration of illness, musical experience, and musical perception.

TABLE 1
Between Group Comparisons: Group Match (Mean and Standard Deviation)

	Treatment Group	Control Group
Age	37.82 (8.8)	38.7 (8.7)
Sex: Male	17	16
Female	4	4
Social Class: 2	2	1
3	14	10
4	2	7
5	3	2
Duration of Illness (years)	11.9 (7.5)	14.5 (8.5)
Musical Perception Test	29.3 (5.2)	29.5 (4.3)
Musical Experience Index	10.2 (3.3)	10.6 (5.4)
Musical Interaction Rating**	4.3 (1.3)	4.1 (1)
Duration of First Improvisation (secs)	373.7 (98)	316.2 (137) *
B.P.R.S.**	18.7 (7.6)	14.9 (6.7)
S.A.N.S.**	48.1 (14.7)	38.4 (15.3)
Hamilton**	11 (4.7)	10.6 (5.4)

* Mann–Whitney $p = .025$ (two-tailed).
** First ratings.

The small difference between the Controls and the Treatment Group's BPRS and SANS scores were nonsignificant (Mann Whitney Test), while the significant difference between groups in the duration of improvisation in the first session is accounted for by three Control Group subjects whose improvisations were much briefer than those of the other subjects.

Within Group Comparisons: First and Final Music and Psychiatric Ratings

Data were normally distributed (Kolmogorov-Smirnov Test). Group means were compared using the Student t test (two-tailed).

Changes in MIR(S)

Table 2 shows that, whereas the Controls showed no significant differences between the first music rating and that administered at the end of the 10-week period, this was not the case for the Treatment Group. Their MIR(S) score for Session 10 of the treatment course was significantly higher than for Session 1 (t test, $t = -4.14$, $p = .001$). The length of musical

TABLE 2
Within-group Comparisons: Between First and Final Music Ratings

	First Rating	Final Rating
Treatment Group		
M.I.R.(S)	4.3 (1.3)	5.4 (1)*
Duration of Improvisation	373.7 (98)	479.9 (131)*
Control group		
M.I.R.(S)	4.1 (1)	4.4 (1.1)
Duration of Improvisation	316.2 (137)	319.7 (92.5)

* t test $p < .004$ (two-tailed).

engagements also increased significantly for the Treatment Group (t test, $t = -3.75$, $p = .001$), whereas there was no significant increase for the Controls.

Changes in Psychiatric Scores

The Control Group showed no significant change between the first and final rating for the BPRS or SANS; for both tests, a drop in scores signals improvement in the patient's condition. The Treatment Group showed a significant drop in their second BPRS rating, taken at the end of their 10 music therapy sessions (t test, $t = 3.22$, $p = .004$), and little change in the SANS ratings. The Treatment Group showed some, nonsignificant, improvement in all subsections of the BPRS, and in all but one (Apathy) subsection of the SANS. The Controls showed a worsening in their BPRS scores for Hostility and Withdrawal, and for their SANS scores for Inattention and Alogia. Other scores showed some, nonsignificant, improvement.

Between Group Comparison: Distribution of Time Units over Nine Levels of Musical Engagement, Sessions 1 and 10

Figures 1A and 1B illustrate the spread of time units for the two groups for the first and last sessions. In Session 1, both groups show the highest concentrations at Level 5 (Tenuous Musical Response) and at Level 4 (Self-directed Musical Response). In the first session the Treatment Group spent 50.4% and the Control Group 56.1% of their time below Level 4 (no musical contact or responses to T). In the final session, the

TABLE 3
Within-group Comparisons: Between First and Final Psychiatric Ratings

	First Rating	Final Rating
Treatment Group		
B.P.R.S.	18.7 (7.6)	14.6 (6.3)*
Anxiety and Depression	4.5 (2)	4 (1.7)
Withdrawal	3.1 (2.5)	2.7 (2)
Thought Disorder	4.1 (3)	3.4 (2.9)
Hostility	2.3 (2)	2.1 (1.7)
S.A.N.S.	48.1 (14.7)	47 (17.8)
Affective Flattening	13.3 (5.4)	13 (6.7)
Apathy	5.9 (3)	6.4 (3.3)
Alogia	3.4 (2.6)	2.5 (2.5)
Asociability	11.4 (3.3)	11 (3.4)
Inattention	3.4 (1.9)	3.4 (2.6)
Hamilton	11 (4.7)	10.2 (3.9)
Control Group		
B.P.R.S.	14.9 (6.7)	12.9 (7.8)
Anxiety and Depression	4 (3)	3.6 (2.7)
Withdrawal	2 (1.6)	2.2 (1.7)
Thought Disorder	4.1 (2.6)	3.3 (2.2)
Hostility	1.3 (1.5)	1.5 (1.9)
S.A.N.S.	38.4 (15.3)	38.6 (18.9)
Affective Flattening	9.7 (4.5)	9.6 (6.8)
Apathy	5.5 (3.5)	5.3 (3.6)
Alogia	3.2 (1.7)	3.5 (2.5)
Asociability	8.7 (3.4)	8.2 (3.9)
Inattention	2.3 (1.6)	2.5 (1.8)
Hamilton	10.6 (5.4)	9.3 (5.4)

* t test, $p < .004$ (two-tailed).

Treatment Group showed a shift, spending the highest proportion of time in Level 6 (Sustained Musical Response), followed by Levels 5 (Tenuous Musical Response), 4 (Self-directed Musical Response), and 7 (Tenuous Mutual Musical Contact). In contrast, the Control Group showed little change from the first session, with Levels 5 and 4 still accounting for the biggest proportion of time. In the final session, the Treatment Group spent 77% and the Controls 52.6% of time above Level 4 (i.e., their musical responses were directed toward T).

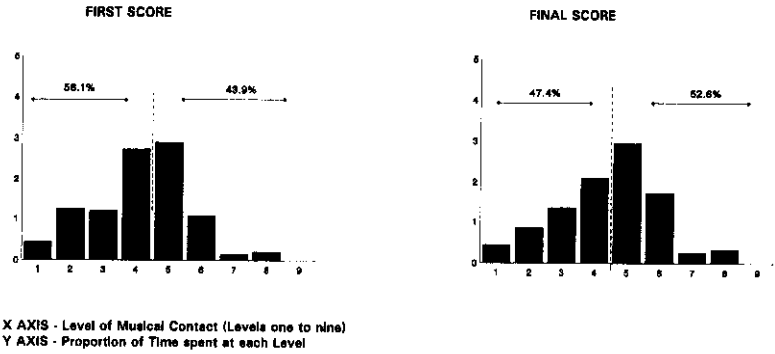

FIGURE 1A.
Proportion of time spent at each level of musical contact: First and final score, Treatment Group.

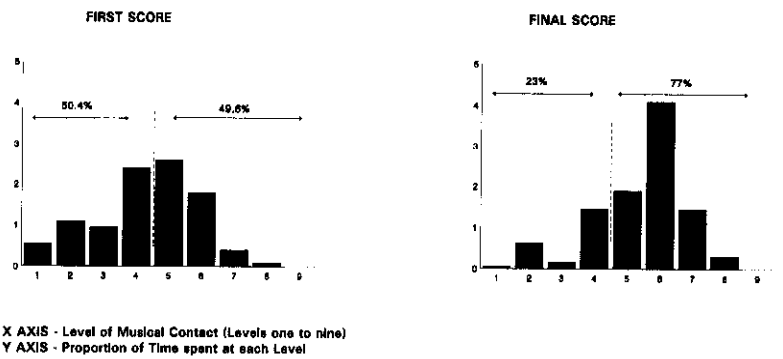

FIGURE 1B.
Proportion of time spent at each level of musical contact: First and final score, Control Group.

Analysis of Covariance

Analysis of Covariance was used to explore the relationship between the various initial and final scores (i.e., did those subjects who showed more improvement in their music scores have higher or lower initial MIR(S) or BPRS scores to begin with?). Results showed that the final BPRS scores (dependent variable) tended to be higher when initial BPRS scores (covariate) were higher in the first place; while the higher the initial BPRS score,

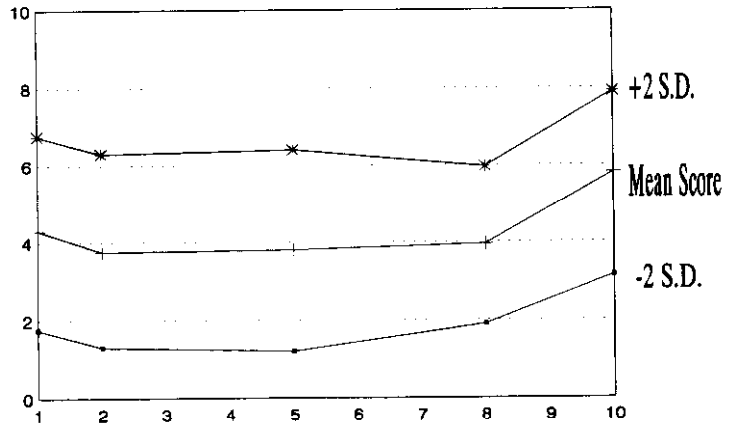

FIGURE 2.
Global MIR(S) treatment group scores: Trend over ten sessions.

the greater the amount of improvement (i.e., the greater the drop) between the first and final BPRS scores.

Trend of Music Improvisation Ratings

Figure 2 illustrates the trend of mean MIR(S) global scores for the Treatment Group over the 10 music therapy sessions with plus and minus two standard deviations, i.e., the mean describes the change of actual scores over the sessions, and the space within the two standard deviations (plus and minus) gives a feel of an expected range of scores around the mean for a normal population (95% confidence interval). The lowest scores occur around Sessions 3 and 5.

Discussion and Conclusions

The two groups were matched as closely as possible for such potentially important variables as age, musical background, and duration of illness. This matching was deliberate, in order to avoid skewing of groups in this first, exploratory study. The Control Group represented patients who were receiving the same standard clinical attention as those given music therapy treatment. No changes in activity were noted at the Day Centre

during the time of the sessions, which might have interfered with this study.

Subjects who attended regular, weekly individual sessions showed a statistically significant improvement in their clinical state, as measured by the BPRS, compared to the Control Group. The Treatment Group also showed a significant increase in their length of musical interaction by the end of the 10 sessions. Control subjects showed a small, nonsignificant improvement for their MIR(S) scores, and the difference in the length of their improvisation between their first and final session was negligible.

The Analysis of Covariance suggests that those subjects whose initial BPRS scores were high (i.e., those who were more severely ill) also had higher final BPRS scores. However, the subjects with high initial BPRS scores showed a greater drop in their scores; they showed a greater degree of improvement in their BPRS scores. This could suggest that chronic schizophrenics who are more severely ill might benefit more from music therapy than those with lower BPRS scores, whose BPRS scores improved by a smaller margin. This trend could be examined in future studies.

Treatment Group subjects clearly improved in their capacity to be responsive to the therapist, even though they did not gain the ability to take the initiative in the musical interactions, i.e., they did not attain Levels 8 and 9 of the MIR(S). The shift of their performance towards Level 6 in the final session is encouraging; here the patient is able to respond to the other person's expressions in an appropriate and sustained manner within the shared context. Thus, when the therapist introduces musical changes to extend the improvisation, the patient's response supports rather than restricts this development; however, the patient does not initiate aspects of interaction. A longer period of treatment might have resulted in higher levels of interaction being reached, and the scores beginning to peak around the eighth session supports this. On the other hand, it may be that a chronic schizophrenic cannot be brought to free and creative levels of cooperation with another person. This question requires further study.

A point of interest is the dip in the music improvisation scores after Session 1 and their rise at Session 10. Sessions 1 and 10

were structured slightly differently than the actual treatment sessions (i.e., Sessions 2 to 9), in that only the bongo drums were made available for the concurrent improvisation, and the improvisation on pitched percussion (the marimba) was a turn-taking rather than concurrent improvisation. The actual treatment sessions were more loosely structured to resemble music therapy sessions, so that in the concurrent improvisations subjects frequently made use of the pitched percussion instruments. The latter renders concurrent improvisation more complex, with subjects having to attend to additional melodic, rather than the purely rhythmic aspect of playing, and this could account for their lower scores in these sessions. It also suggests that chronic schizophrenics might benefit more from restricted options in music therapy, i.e., purely rhythmic work or melodic interchange rather than concurrent playing.

An unexpected result of this study was the significant lengthening of the Treatment Group's musical engagements over the 10 sessions. The sustaining of any communicative interaction, such as a conversation, depends on variation and fluctuation of its content and of its musical components or prosodic features, that is, the shared "narrative or message" (Buck, 1985). An unvaried musical interaction that becomes perseverative and stereotyped would not be of therapeutic benefit to the patient—indeed, it could be seen as reinforcing the schizophrenic person's impoverished communicative capacity—and the therapist should not allow this kind of interaction to be sustained. Thus, the lengthening musical engagements for the Treatment Group reflects the qualitative improvement in the musical interaction; the improvisations could be developed further and for longer because the two players had "more to say" to one another.

The MIR(S), extended for this study, provides useful clues about schizophrenic patients' interactive capacities as these are revealed in a musical context. This affirms previous work which showed that (so-called normal) persons whose communicative skills have not been hampered by illness achieved higher levels of musical interaction, as rated using the MIR, than did those suffering from unipolar depression and from schizophrenia (Pavlicevic & Trevarthen, 1989), thus establishing the link between communicative capacity and quality of musical engagement in music therapy. In this study, the different levels in the

MIR(S) describe the following interactive dynamics: How responsive is the patient to the therapist's playing, to changes in the musical statements, to the development of a musical theme, to an increase in musical tension (through harmonic structuring, a faster tempo and a louder dynamic level, for example)? How does the patient cope with these changes: Does he or she retreat into a repetitive and rigid rhythmic pattern, thus shutting out possibilities of sharing the change? Does he or she become disorganized, so that the patient and therapist lose musical contact altogether? Does the patient's incapacity for responding and for taking the musical initiative restrict the musical vocabulary of the interaction? Is the patient at all aware of the limitations of the interaction? The MIR(S) appears to be a highly sensitive instrument for assessing and discussing the interactive capacities of chronic schizophrenic patients through the examination of their musical improvisation in this form of music therapy.

It is interesting to note that, despite the groups being well matched for musical experience, the Treatment Group performed significantly better in the final music interaction ratings. This strengthens our case that it is the communicative (rather than the purely musical) capacity of the subject which is elicited in this technique of music therapy and, further, that this communicative capacity, although elicited through the medium of music, can be teased out from previous musical knowledge and experience. This understanding is supported by literature demonstrating the "musical" character of complex communications between mothers and infants younger than 6 months of age (Beebe, Feldstein, Jaffe, Mays, & Alson, 1985; Trevarthen, 1986, 1987; Tronick, Als, & Adamson, 1979). Thus, the essential communicative ingredients are musical, and it is precisely these musical-communicative ingredients that are elicited in music therapy improvisation (Pavlicevic, in press).

Finally, the Treatment Group subjects found the weekly individual music therapy sessions pleasurable and engrossing, supporting an earlier study (Heany, 1992). The good attendance and the small dropout rate (only two subjects dropped out of the Treatment Group and one out of the Control Group) confirm this. Indeed, Treatment Group subjects spontaneously commented on their enjoyment of the sessions, and noted their

increased confidence and improved concentration, as well as remarking how hard they had worked during the sessions.

It appears from these results that, in addition to improving patients' quality of life, regular, individual music therapy invites, encourages, and supports the development of an intimate, nonverbal interaction and enhances the quality of patients' communicative skills. Individual music therapy sessions may indeed be useful in the rehabilitation of some chronic schizophrenic patients.

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Effect of Stimulative and Sedative Music on Systolic Blood Pressure, Heart Rate, and Respiratory Rate in Premature Infants

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This investigation compared the effects of two different types of music—sedative and stimulative—on premature infants in isolettes in an intensive care nursery (ICN). Systolic blood pressure, heart rate, and respiratory rate were observed and measured for increase or decrease from the resting values. Ten premature infants (age 33 to 35 weeks post-conception) who were receiving oral feeding were selected as subjects from a Level III ICN regional referral center. Infants with intensive medical conditions were excluded from the study. Infants were tested in the same isolette and at the same time of day. Infants were pretested for functional hearing, and music levels were presented at 78 ± 2 dB (sound pressure level). A 10-minute resting range was measured prior to a 10-minute music intervention. Music sessions were presented on two consecutive days to prevent overstimulation; the stimulative selection was "Sabre Dance," while the sedative selection was "Moonlight Sonata." Results, analyzed via ANOVA, indicated significant results for "Sabre Dance" vs. baseline, for "Moonlight Sonata" vs. baseline, and for "Moonlight Sonata" vs. "Sabre Dance." Similar results were observed for heart rate and for respiratory rate. Results showed that music had an effect on physiological responses of premature infants.

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Improved technology, coupled with advances in medicine, is affording a greatly improved chance for survival for premature infants. Because premature infants have not reached the developmental level of their full-term counterparts, they face multiple medical and social problems. In most large city hospitals, regional referral intensive care nursery units (ICNs) are in place to provide isolettes and medical procedures necessary for life support. The ICN environment in which premature infants begin their lives is extremely stimulating—visually, auditorily, and tactilely. Certain stimuli such as sound and light are constantly present; their impact, if any, is unknown. Research is needed, therefore, to examine the effect of these stimuli on the physiological parameters of premature infants.

Scarr-Salapatek and Williams (1973) first hypothesized that premature infants were deprived of sensory stimulation. However, it has since been established that premature infants in ICNs are exposed constantly to intensive environmental stimuli (Bass, Peek, & Chapman, 1984; Gottfried, Hodgeman, & Brown, 1984; Lawson, Daum, & Turkewitz, 1977). Gottfried and colleagues found that lighting did not vary from day to night and that sound level reached intensities of 70–118 decibels (dB); the premature infants had contact or handling on the average of once every 18–30 minutes.

Sound penetrates the isolette environment in which premature infants live. Moreover, isolettes themselves have a high noise level—produced by the motor sound and compounded by noise from the life support system (Bass, Peek, & Chapman, 1984). Low frequency sound levels in isolettes have been measured at 70–80 dB. Life support systems increase the overall noise level in the isolettes by 15 to 20 dB. Striking the side of the isolette can cause the noise level to reach 130–140 dB.

Neonates have been found to prefer low frequency sounds, probably due to the stimulating sounds heard in the intrauterine environment (Watterson & Riccillo, 1985). Noise levels in utero have been measured at about 85 dB with peaks to 95 dB. External sound levels above 85 dB have reportedly increased the fetal heart rate within 5 seconds (Linn, Horowitz, & Fox, 1985; Livingston, 1979).

Sensory stimulation also plays a crucial role in the infant's neurological and physical maturation process. Studies have shown

that auditory stimulation can be beneficial to premature infants relative to weight gain and decreased hospital stay (Chapman, 1983); enhanced auditory and visual responses (Katz, 1971); advanced social and neurological development (Scarr-Salapatek & Williams, 1973); and decreased irritability and wakefulness (Segall, 1972).

Auditory stimulation of the fetus has been studied in countries other than the United States. Studies in Norway (Jensen, 1984a, 1984b; Jensen & Flottorp, 1982) and in Brazil (Luz, Lima, Luz, & Feldens, 1980) showed that fetal heart rate increased in response to sound stimuli of at least 80 dB.

Chapman (1983) studied preterm infants in New York to assess the effect of auditory stimuli on gross limb activity. This study demonstrated that specific auditory stimuli were more effective in decreasing activity than were environmental sounds. Moreover, infants who had the musical auditory stimulation of Brahms Lullaby not only decreased limb activity, but reached a discharge weight of at least 2,040 grams 1 week sooner than did those infants who had as auditory stimulation their mother's voice on tape.

Caine (1991) studied the effect of music on stress behaviors, weight, caloric and formula intake, and length of hospital stay of preterm infants in the ICN. She reported that the group exposed to vocal music, including lullabies and children's music, had significantly increased daily weight gain, increased caloric and formula intake, decreased stress behavior, and decreased length of hospital stay.

The sound of music has been used in varied ways throughout history. Primitive man used sound to communicate with the spirit world. Stories link music with Satan enticing men to his kingdom. The Pied Piper of Hamlin led a town's children away with his music (Alvin, 1975).

Music as a stimulus for healing has also been used for centuries (Alvin, 1975; Standley, 1986). In a randomized controlled trial examining the use of music during laceration repair, music was shown to have significant effects in reducing pain (Menegazzi, Paris, Kersteen, Flynn, & Trautman, 1991). Music has also been shown to enhance relaxation during magnetic resonance imaging (Slifer, Penn-Jones, Cataldo, Conner, & Zerhouni, 1991). Even in its simplest form, music can evoke many sensations,

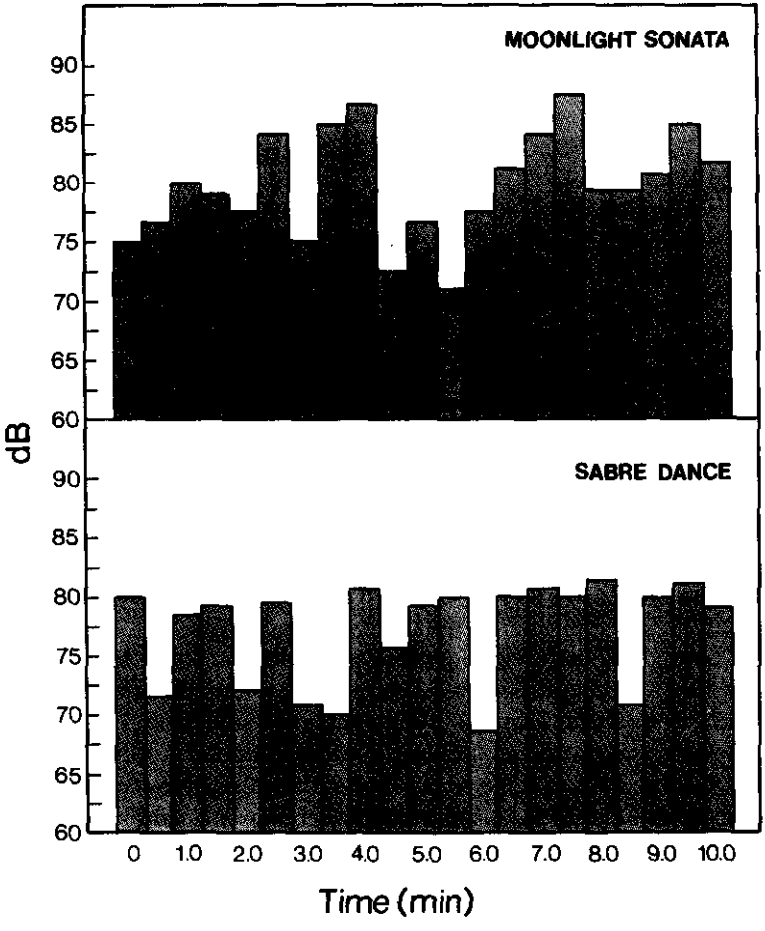

FIGURE 1.
Decibel levels for "Moonlight Sonata" and "Sabre Dance."

moods, and emotions; as early as the 18th century, musicians document the effect of different types of music on human moods (Ostward, 1966).

The first research examining the relationship between music and physiologic response was reported by Hyde (1924), who examined music's effect on cardiovascular systems. Other studies have studied the effect of music on respiration, heart rate,

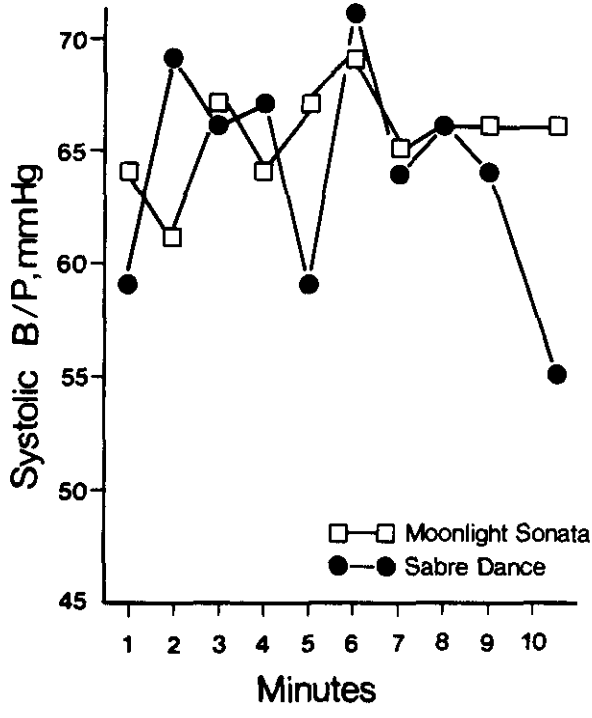

FIGURE 2.
Mean blood pressure while listening to "Moonlight Sonata" vs. "Sabre Dance."

galvanic skin response, muscle tension, and brain waves (Standley, 1986). Generally, these studies have shown that slow, quiet, nonvocal music decreased physiological response, while faster music increased response.

Physiological response of premature infants to stimulative and sedative music has not been systematically studied. Gaston (1951) defined stimulative music as featuring a primitive, driving rhythm with detached notes and the use of percussion. In contrast, sedative music contains melodic passages of sustained notes that lack the use of percussion or strong rhythm.

In many ICNs, different types of music are constantly present. The present study was designed to study the effect of stimulating and sedating music on the heart rate, respiratory rate, and systolic blood pressure of premature infants.

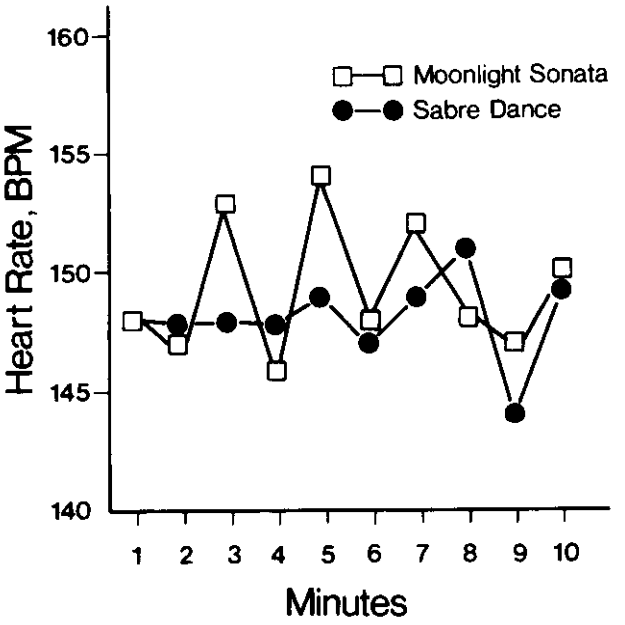

FIGURE 3.
Mean heart rate while listening to "Moonlight Sonata" vs. "Sabre Dance."

Method

Subjects for this study consisted of ten premature infants (six female, four male). Post-conceptual age ranged from 33–35 weeks, with a mean of 34.3 weeks. All subjects were selected from a 15-bed intermediate care unit of a Level III ICN regional referral center in East Tennessee.

Criteria for subject selection included: (a) post-conceptual age of 32 to 36 weeks, and (b) receipt of oral feedings. Infants with the following medical conditions were excluded from the study: infection, congenital malformation, intracranial hemorrhage, seizure activity, respiratory disease, hearing deficit, receipt of ototoxic drugs, or assisted ventilation.

Before an infant was included in the study, a certified audiologist pretested the infant to confirm that auditory development was consistent with normal hearing. The auditory brainstem response (ABR), a noninvasive clinical procedure, was used

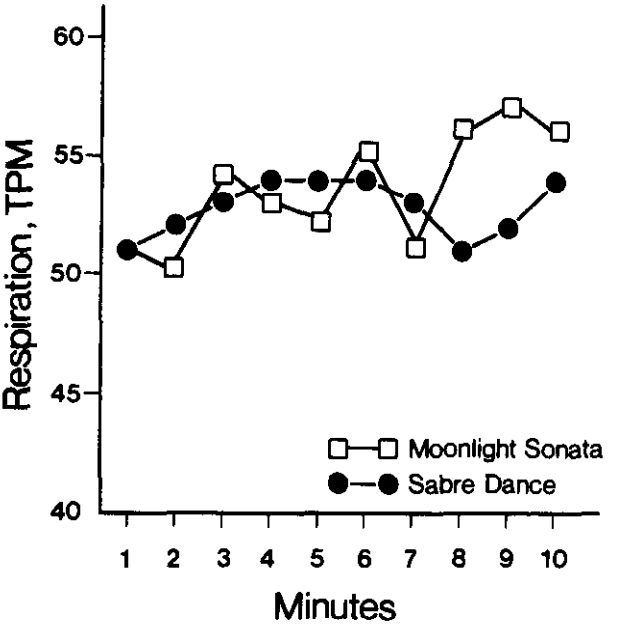

FIGURE 4.
Mean respiratory rate while listening to "Moonlight Sonata" vs. "Sabre Dance."

to test for auditory system integrity; all ten infants passed the ABR test.

Subjects were orally fed 1½–2 hours before the onset of music intervention. Some of the infants were in isolettes at the time of the study, while some were in bassinets. To keep conditions constant, infants were placed in the same isolettes for testing; an Airshield single-wall model C-86 was used for each testing procedure.

Immediately before each intervention, sound level in the isolette was measured at 58 dB. This level was needed to determine the volume level necessary for the musical stimulation. The music level was calibrated at 20 dB above the background level. The music presented to the infants was calibrated and presented at 78 dB ± 2 dB.

Two separate types of music were presented to each subject: sedative ("Moonlight Sonata") and stimulative ("Sabre Dance").

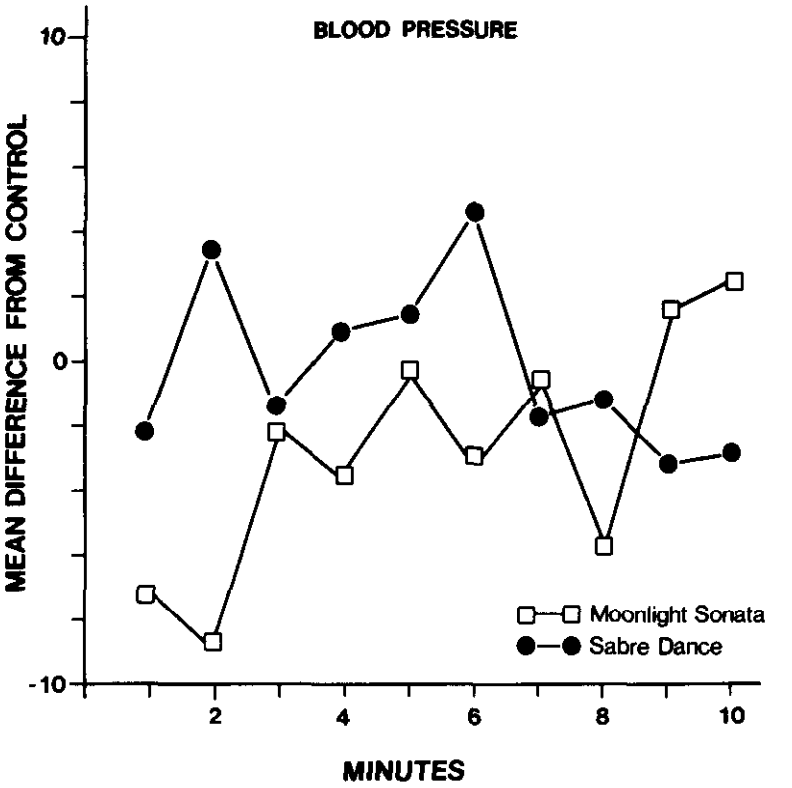

FIGURE 5.
Mean difference from baseline of blood pressure while listening to "Moonlight Sonata" and "Sabre Dance."

The order of music played was counterbalanced across subjects, and was presented in 20-minute sessions on two consecutive days to prevent overstimulation of subjects.

A General Electric minicassette was placed 6" from the sound level meter microphone and the subject's head. The sound level meter microphone was placed 3½" into the isolette. A neonatal blood pressure cuff was placed on the subject's left arm, and was connected to a Dinamap Neonatal Vital Sign Monitor No. 1846 (Critikon). Clothing around the chest wall was removed to provide a full view of the infant's chest in order to count

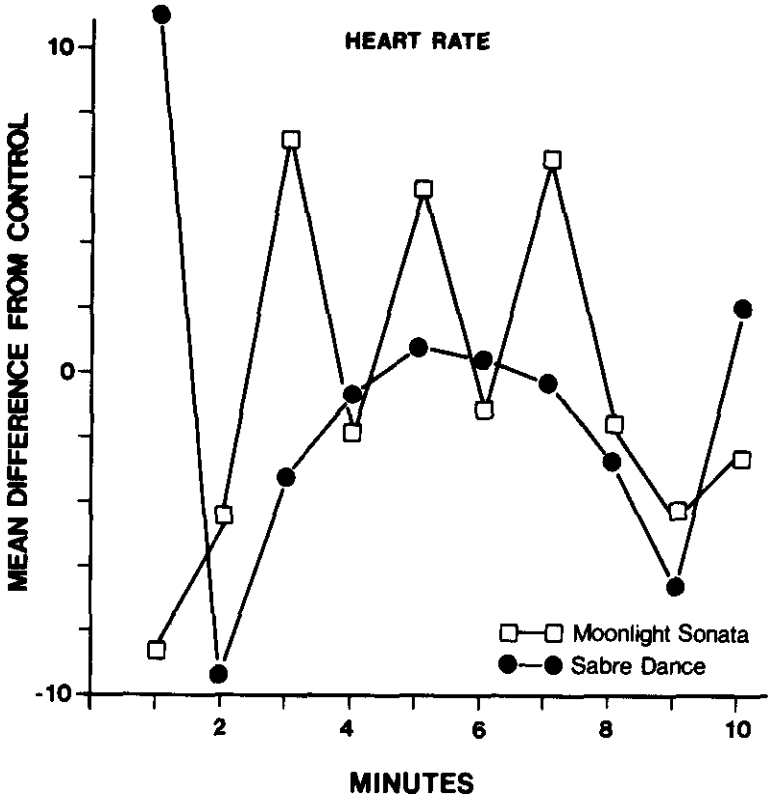

FIGURE 6.
Mean difference from baseline of heart rate while listening to "Moonlight Sonata" and "Sabre Dance."

respirations. No other medical or nursery interventions were performed during the testing period.

A 10-minute baseline measurement of each parameter (heart rate, blood pressure, and respiratory rate) was obtained before the beginning of music intervention. Heart rate and blood pressure were recorded every minute by the Dinamap monitor. Respiratory rate was counted every minute by the researcher (15 seconds × 4). All subjects were tested between 3:00 p.m. and 5:00 p.m.

Certain cut-off parameters were established to reduce any

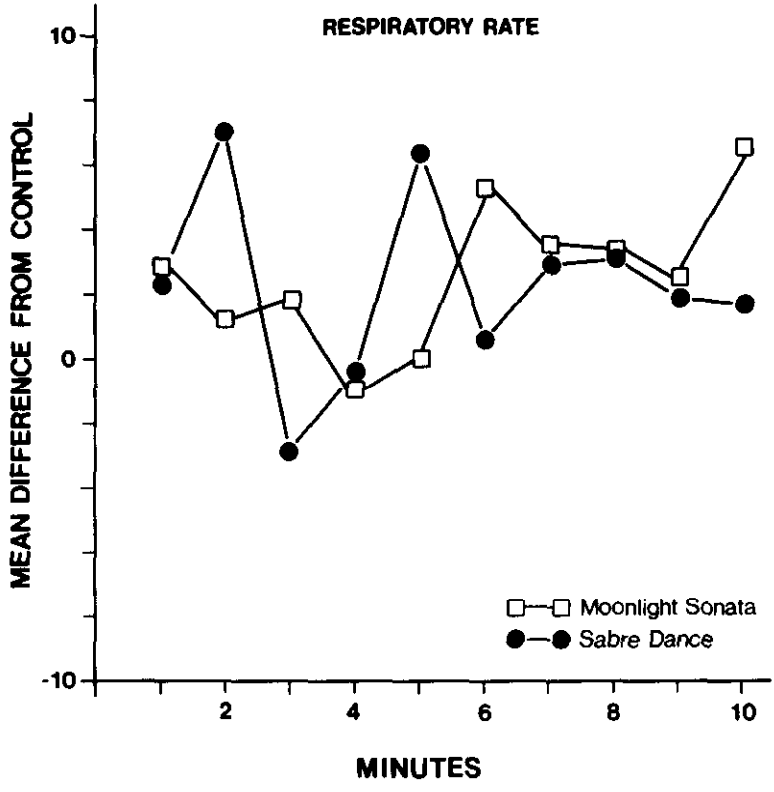

FIGURE 7.
Mean difference from baseline of respiratory rate while listening to "Moonlight Sonata" and "Sabre Dance."

risk to the infant. Intervention was to be immediately discontinued and the infant withdrawn from the study if any of the following occurred: heart rate of 200 beats per minute, respiratory rate of 100 times per minute, and systolic blood pressure of 100 mm Hg. Sound levels in the isolette were continually monitored to keep exposure at or under 80 dB. Decibel levels for each music selection are presented in Figure 1.

Results

Figures 2 through 4 show the mean blood pressure, heart rate, and respiratory rate while listening to "Moonlight Sonata"

TABLE 1
Physiologic Changes by Condition
Mean ± SD

Minute		Baseline	"Sabre Dance"	Baseline	"Moonlight Sonata"
1″	BP	66.8 ± 7.67	64.6 ± 6.34	71.6 ± 12.05	64.6 ± 8.77
	HR	158.6 ± 14.36	147.6 ± 19.28	157.1 ± 14.38	148.4 ± 14.23
	RR	49.4 ± 12.00	50.8 ± 11.00	48.4 ± 9.87	51.2 ± 14.45
2″	BP	65.8 ± 6.92	69.1 ± 9.71	69.9 ± 10.42	61.3 ± 9.05
	HR	156.9 ± 11.08	147.5 ± 16.66	151.3 ± 13.76	146.8 ± 16.06
	RR	47.0 ± 5.76	52.0 ± 11.77	49.2 ± 8.85	50.4 ± 16.56
3″	BP	67.4 ± 5.60	65.9 ± 7.82	69.6 ± 6.48	67.3 ± 7.68
	HR	151.3 ± 13.39	148.2 ± 19.74	146.2 ± 16.25	153.2 ± 13.14
	RR	56.2 ± 10.93	53.4 ± 13.79	52.0 ± 9.79	53.8 ± 18.14
4″	BP	66.1 ± 8.84	67.0 ± 6.44	67.8 ± 9.81	64.3 ± 5.37
	HR	148.5 ± 16.93	148 ± 19.03	148.3 ± 16.83	146.3 ± 12.15
	RR	54.0 ± 10.87	53.6 ± 14.13	536 ± 10.18	52.8 ± 16.41
5″	BP	65.6 ± 8.74	66.9 ± 6.48	67.8 ± 8.95	67.6 ± 9.99
	HR	146.7 ± 18.13	148.2 ± 14.88	146.9 ± 16.36	153.7 ± 18.32
	RR	47.6 ± 11.53	54.0 ± 9.66	51.6 ± 11.84	51.6 ± 16.70
6″	BP	66.7 ± 7.36	71.2 ± 12.02	71.8 ± 9.01	68.8 ± 10.55
	HR	145.5 ± 18.01	146.7 ± 19.25	149.1 ± 18.19	147.9 ± 15.03
	RR	52.6 ± 11.23	53.2 ± 10.16	50.0 ± 8.69	55.2 ± 14.33
7″	BP	67.5 ± 8.89	63.9 ± 7.03	66.3 ± 8.27	65.6 ± 9.44
	HR	149.4 ± 15.32	149.1 ± 18.50	145.8 ± 28.88	152 ± 14.02
	RR	49.9 ± 9.21	52.8 ± 5.00	47.4 ± 7.89	50.8 ± 22.55
8″	BP	67.4 ± 7.72	66.1 ± 6.96	72.0 ± 12.22	66.1 ± 9.72
	HR	153.9 ± 14.79	151.7 ± 18.61	149.7 ± 15.86	148.0 ± 12.13
	RR	48.2 ± 9.44	51.2 ± 15.29	52.8 ± 7.95	56.0 ± 16.22
9″	BP	66.3 ± 8.09	63.1 ± 7.17	64.7 ± 7.22	66.3 ± 7.24
	HR	150.7 ± 14.62	144.2 ± 18.93	151.3 ± 15.81	147.1 ± 16.13
	RR	50.2 ± 11.17	52.0 ± 12.22	53.2 ± 8.44	55.6 ± 17.93
10″	BP	642 ± 10.00	61.3 ± 7.22	64.0 ± 7.02	66.2 ± 8.52
	HR	146.9 ± 19.53	148.9 ± 19.26	152.8 ± 18.35	150.1 ± 18.67
	RR	52.6 ± 14.78	53.8 ± 12.80	50.0 ± 11.19	56.4 ± 11.84

vs. "Sabre Dance." Mean systolic blood pressure appeared to be more variable during "Sabre Dance." There seemed to be more variation in heart rate during "Moonlight Sonata," while respiratory rate appeared to be about the same for both selections.

Figures 5 through 7 show the mean differences between baseline and music conditions for blood pressure, heart rate, and respiratory rate. Systolic blood pressure was higher and

TABLE 2
ANOVA Summary Table

	"Sabre Dance vs. Baseline"		
Babies	BP S	HR NS	RR S
Time	BP NS	HR S	RR NS
	"Moonlight Sonata" vs. Baseline		
Babies	BP S	HR S	RR S
Time	BP S	HR NS	RR NS
	"Sabre Dance" vs. "Moonlight Sonata"		
Babies	BP S	HR S	RR S
Time	BP NS	HR S	RR NS
Music Type	BP S	HR NS	RR NS
Music Type × Time	BP S	HR NS	RR NS

Note. BP = blood pressure; HR = heart rate; RR = respiratory rate; S = significant; NS = not significant.
Range p: <.05–<.001.

more variable during "Sabre Dance," while heart rate was more variable during "Moonlight Sonata."

Physiologic changes are shown in Table 1, and ANOVA results are presented in Table 2. Blood pressure results were significantly different for music contrasted with baseline conditions and between music selections. Similar results were observed for heart rate and respiratory rate.

Discussion

The present study demonstrated significantly different effects of stimulative and sedative music on specific physiological parameters. The effect, especially on systolic blood pressure, might have an important impact on the care of sick premature infants in the ICN in an effort to prevent intraventricular hemorrhage. The calming and stabilizing effect of sedative music might help to reduce the use of sedative drugs in infants on ventilators and reduce the incidence of pulmonary barotrauma.

In addition, one might need to reconsider the generally accepted, wide-open space design of modern ICNs. Results of this study suggest that future ICNs should have separate environmental control, especially concerning sound and light, for each individual infant.

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The Effect of Participation in an Intergenerational Choir on Teens' and Older Persons' Cross-Age Attitudes

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The purpose of the present study was to examine the effect of participation in an intergenerational choir on teens' and older persons' cross-age attitudes. Twenty-seven high school students and 24 older persons served as subjects in the present study. Subjects were divided into four groups based on age (teen or senior) and gender. Ages of the total group ranged from 16 years to 85 years. Subjects were pretested using the Age Group Evaluation and Description (AGED) Inventory *to determine their pre-existing attitudes toward four groups: teen males, teen females, senior males, and senior females. Subjects, therefore, evaluated members of their own classification and each of the three other classifications. Following the preassessment, members participated in an intergenerational choir which met once a week for 1.5 hours for the school year. Subjects also participated in additional social activities associated with the choir. After completing the spring semester, subjects were given a posttest assessment using the same attitudinal scale. Results of the posttest indicated that attitudes of male and female teen subjects toward themselves and each other moved in a negative direction from pretest to posttest. Their attitude toward the seniors, males, and females, however, moved in a positive direction. Male and female seniors' attitudes toward teens and toward themselves moved in a positive direction from the pretest to the posttest. The attitudes of the male seniors indicated the most positive change; furthermore, attitudes*

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toward male seniors reflected a greater positive change than attitudes toward any of the other three groups. Implications for intergenerational programming are discussed.

Attitudes play an active role in our everyday lives. They are evident in our reactions to events, in making decisions, and in conversing with others. Attitudes are enduring, general evaluations of people, objects, or issues (Baron & Byrne, 1987). An attitude has three components: affect, behavior, and cognition. These components refer to our feelings, actions, and thoughts regarding the attitudinal target. Many attitudes are learned during the course of socialization.

Attitudes carry the connotation of a "pro" or "con" disposition toward a person or object. Ageism is a "con" attitude which demonstrates prejudice against members of a chronological age group (Schonfield, 1982). Ageism, termed "cohort centrism" by Riley, Johnson, and Foner (1972), is a form of generational chauvinism. Though usually directed at older persons, ageism also exists among the elderly toward the young. The animosity or negativism of ageism can be expressed by people of any age group against those of any other. Ageism is pervasive in literature, movies, television, and advertising. It is often portrayed as a person's fear of growing older or an older person's sense of lost youth and opportunity.

Ageism, like any other "ism," can be detrimental to society and the interpersonal relationships within it. The relationship between teens and older persons is analogous to a one-way mirror. Older persons can look back in time to their teen years; however, teenagers cannot look into the future and see themselves as "old." Indeed, most teenagers find it very difficult to even imagine themselves as an older person. Most older persons remember their youth with affection and nostalgia; to the contrary, most young people look upon life's later years as less than "golden."

Prejudice and stereotyping can also influence interpersonal relationships between members of differing age groups. Prejudice is found when negative behavior is demonstrated toward all or almost all members of a group. Stereotyping is shown by behaving toward members of a specified class according to its

members' assumed characteristics and not in accord with an individual's own characteristics (Baron & Byrne, 1987). Age attribution is a form of stereotyping and is often explicit in explanations offered for the behaviors of both older persons and teenagers. Chronological age actually has very little relevance in explaining behaviors (Butler, 1980; Neugarten, 1977); however, cultural expectations, and hence terms such as "age-appropriate," have much to offer as possible explanations for certain behaviors.

The assessment of attitudes toward the elderly has been a major concern in gerontology since the pioneer studies of Tuckman and Lorge (1953, 1954, 1958) nearly 40 years ago. These studies characterized old age as a period marked by poor health, economic insecurity, loneliness, resistance to change, and failing mental and physical health. Since that time, there has been a lack of agreement about the content and severity of these attitudes toward older persons (Schonfield, 1982). Because of the improvement in the status of nontraditional groups in the United States and legislative actions to protect the rights of older persons, an ever-increasing segment of society, attitudes toward old age seem to be experiencing a shift toward more positive descriptions; however, a number of factors remain which relate to age stereotyping.

Braithwaite (1986) tested the hypothesis that age stereotyping with specific targets would occur when targets were disabled. Results confirmed that disabled elderly adults were judged more harshly than nondisabled elderly adults, but no more so than their young counterparts. These data corroborate the findings of other researchers (Connor, Walsh, Litzelman, & Alvarez, 1978; Puckett, Petty, Cacioppo, & Fischer, 1983) that indicate disability is a more potent cue than age. Data from the ratings of nondisabled targets showed evidence of both positive and negative age stereotyping by this sample. The elderly male and female targets were perceived as more concerned for others and more responsible than their younger counterparts; however, older targets were also judged less active and sociable than younger targets. These data support the findings of other studies (Hultsch & Deutsch, 1981; McKenzie, 1980), which document old age stereotypes that evoke the notion of frailty, slowness, irritability, dependency, withdrawal, vagueness, and stagnation.

Walsh and Connor (1979) found age stereotypes to be gender related. Participants evaluated an essay that described a work of art and which was attributed to either a 25-year-old male or female or a 64-year-old male or female. Essay quality affected evaluations of young male and elderly female authors, but had little impact on evaluations of young females and old males. The authors (Connor & Walsh, 1980) later attempted to replicate this interaction within a job interview setting; however, the results of this study did not support the findings of their earlier work. Regardless of the target's age and gender, competent and hired applicants were rated significantly more positively on all questions than their not-hired or less competent counterparts. Hence, interactions between age and gender of the targets did not affect subjects' sensitivity to competence differences between those targets. The absence of gender-related age stereotypes has also been found by other investigators (Braithwaite, 1986; Eisdofer & Altrocchi, 1961; O'Connell & Rotter, 1979).

Banziger and Drevenstedt (1982) studied age attribution and its relation to success and failure. They found that age was a salient attribution, made by both young and old judges, for both the success and failure outcomes of the older female stimulus person compared with that of the younger female stimulus person. The age of the 30-year-old woman was more likely attributed, by both older and younger judges, as a cause of success than was the age of the 70-year-old woman. Old age was also viewed as a causal factor in failure. Reno (1979) found similar results with men. The failure of an older man was attributed to lack of ability and task difficulty, whereas a young man's failure was attributed to lack of effort.

Early investigators (Drake, 1957; Tuckman & Lorge, 1954, 1958) found little or no relationship between contact with the elderly and stereotypic attitudes toward the elderly. Later researchers (Rosencranz & McNevin, 1969), investigating the effects of differential social experiences on subject stereotypes of the aging individual, found that the amount and quality of contact with aged persons would affect the valence of respondent attitudes toward the person "70 years of age or older." Respondents who had close grandparent contact (daily or weekly visits with at least one grandparent) judged the aged more

favorably than those having little or no contact with grandparents. Likewise, respondents who had meaningful contact with at least one older nonrelated person exhibited favorable attitudes toward older persons. The quality of contact with older persons also seemed to influence respondent judgments. For example, subjects who had experienced contact with older persons in a hospital setting assigned more negative evaluations of the "target stimulus" (an older man).

Killian (1989) was interested in the relationship between social contact and music students' attitudes toward older persons. The purpose of her study was to examine the effect of singing at a nursing home on student attitudes toward the elderly. Seventh- and eighth-grade choir students in a large suburban junior high were surveyed as to their opinions about the elderly and about singing at a nursing home. The survey asked students to indicate their reactions to a series of questions about older persons. They were also asked to write three sentences describing their feelings about the choir singing at a nursing home. The choir then sang a 20-minute concert at a local nursing home. At the end of the concert, choir members were asked to approach a nursing home resident in the audience, find out his or her name, and share a prepared song sheet with the resident during the sing-along that followed. In the class period following the concert and sing-along, choir members again completed the survey assessing their feelings about singing for nursing home residents. Results indicated that responses to all questions were more positive after singing at the nursing home. Most written responses were positive, with positive responses increasing after the nursing home experience.

Because our culture covets youth and physical perfection, many young people dislike the idea of growing old; however, aging is a natural process that can only be avoided by an untimely death. Perhaps there are opportunities to fashion teenagers' images of older persons and to foster positive attitudes toward aging. Positive attitudes toward older persons internalized by teenagers tend to persist into adulthood, and consequently may contribute to their self-concept as they themselves age. The purpose of the present study was to examine the effect of participation in an intergenerational choir on teens' and older persons' cross-age attitudes.

Method

Subjects

Twenty-seven high school students and 24 older persons served as subjects in the present study. Subjects were divided into four groups based on age (teen or senior) and gender. Ages of the total group ranged from 16 years to 85 years. Teen subjects, 14 female and 13 male, were members of a select suburban high school in the midwest. Senior subjects, 16 female and 8 male, were volunteers from the local community. Both groups formed the intergenerational choir. Senior members had participated in such a choir previously; however, teen members had no prior experience participating in an intergenerational choir.

Procedure

At the beginning of the school year, before participation in the intergenerational choir began, subjects were pretested concerning their attitudes toward four groups: teen males, teen females, senior males, and senior females. Subjects therefore evaluated members of their own classification and each of the three other classifications. These data were analyzed to assess pre-existing attitudes toward all four groups.

Following the preassessment, members participated in an intergenerational choir which met once a week for 1.5 hours for two semesters. Rehearsal seating was such that members of both age groups were interspersed. Choral material used for the group consisted of contemporary popular songs, old tunes that would have been popular during the younger years of the senior members, traditional patriotic songs, and Broadway favorites. Subjects participated in additional social activities associated with the choir. One such activity was a day-long retreat held at the beginning of the school year with teens, their parents, seniors, and the director. During this retreat, choir members sang together, participated in "getting acquainted" activities, shared life stories, and selected "adopted" partners. Other activities included three trips and four social get-togethers. The choir also gave 22 performances. After completing the spring semester, subjects were given a final assessment using the same attitudinal scale.

TABLE 1
Subscale Items for Evaluative Analysis of the AGE Inventory

Goodness	Positiveness
Generous/Selfish	Productive/Unproductive
Sensitive/Insensitive	Optimistic/Pessimistic
Considerate/Inconsiderate	Flexible/Inflexible
Patient/Impatient	Hopeful/Dejected
Honest/Dishonest	Involved/Apathetic
Wise/Foolish	Sociable/Unsociable
Sincere/Insincere	Imaginative/Unimaginative

Test Instrument

The test instrument used for this study was *The Age Group Evaluation and Description (AGED) Inventory*. The instrument was recently constructed and validated by a team of social psychologists at Queen's University in Kingston, Canada. The AGED Inventory is a semantic differential type instrument consisting of four 7-item scales. Using confirmatory factor analyses and coefficients of congruence and data from 700 male and 700 female respondents, it was demonstrated that the factor structures of its two evaluative scales (Goodness, Positiveness) and of its two descriptive scales (Maturity, Vitality) are replicable for young, middle-age, and old targets assessed in either between or within subject designs. Its ease of administration, multifaceted nature, and the flexibility with which targets can be specified make the AGED Inventory useful in a variety of contexts requiring the assessment of attitudes toward particular

TABLE 2
Subscale Items for Descriptive Analysis of the AGED Inventory

Vitality	Maturity
Independent/Dependent	Satisfied/Dissatisfied
Busy/Idle	Trustful/Suspicious
Active/Passive	Other-oriented/Self-oriented
Expectant/Resigned	Accepting/Demanding
Assertive/Timid	Dignified/Undignified
Adventurous/Cautious	Modest/Boastful
Sexy/Sexless	Even-tempered/Temperamental

TABLE 3

Means and Standard Deviations for All Groups Regarding Attitudes Toward All Groups

		Attitudes of							
		Male Teens		Female Teens		Male Seniors		Female Seniors	
Attitude Toward	Test	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Male Teens	Pre	4.15	0.42	4.20	0.56	4.23	0.83	4.95	0.97
	Post	4.10	0.43	4.00	0.31	5.19	0.43	5.14	0.57
Female Teens	Pre	4.59	0.36	5.09	0.48	4.27	1.13	5.15	0.54
	Post	4.47	0.51	4.78	0.55	5.38	0.48	5.30	0.45
Male Seniors	Pre	4.49	0.45	4.72	0.94	4.79	0.32	5.07	1.01
	Post	5.05	0.48	5.37	0.80	5.61	0.25	5.38	0.63
Female Seniors	Pre	4.55	0.63	5.05	0.84	4.75	0.74	5.35	0.76
	Post	5.05	0.58	5.27	0.79	5.34	0.48	5.37	0.61

age groups. Items included in each of the subscales are found in Tables 1 and 2.

Results

Survey data were obtained such that attitudes toward both genders (male and female) in both age ranges (teen and senior) could be analyzed with regard to the age and gender group from which it was collected (teen male, teen female, senior male, or senior female). Each survey was broken down into four subscales. Two subscales were evaluative in nature (Goodness and Positiveness) and two were descriptive (Vitality and Maturity).

Subjects rated each group by checking a line between two diametrically opposed adjectives. Scores for each set of adjectives were obtained by assigning a numerical value to each possible answer on a scale from 1 to 7. The most positive answer would receive a score of 7, the most negative, a score of 1. All data were entered into SPSS® data files for analyses.

Overall means and standard deviations for all age and gender groups toward all age and gender groups both before (pre) and after (post) singing in the intergenerational chorus are reported in Table 3. Illustrated in Table 4 are the directions and degrees of attitudinal change reflected by the means in Table 3. Attitudes of teen subjects toward themselves and each other showed

TABLE 4
Pre and Posttest Attitude Changes for All Groups

Attitude Toward	Changes of Attitudes of			
	Male Teens	Female Teens	Male Seniors	Female Seniors
Male Teens	−0.05	−0.20	+0.96	+0.19
Female Teens	−0.12	−0.31	+1.11	+0.15
Male Seniors	+0.56*	+0.65	+0.82*	+0.31
Female Seniors	+0.50	+0.22	+0.59	+0.02

* Indicates a significant difference at $p < .01$.

a move in a negative direction in every case. All attitudes of the seniors and toward the seniors changed in a positive direction from the pretest to the posttest. The attitudes of the male seniors indicated the most positive change; furthermore, attitudes toward the male seniors reflected a greater change than any of the other three groups. Results of t test procedures indicated that these changes in attitudes were significantly improved with regard to male teens ($t = 2.93$, $df = 22$, $p = .008$) and male seniors ($t = 4.31$, $df = 7$, $p = .004$). Table 5 more clearly illustrates each group's attitudes toward all groups by placing their scores in a rank ordering according to their mean assessments for both the pretest and posttest.

Subscale means and standard deviations for all age and gender groups considering their attitudes toward male teens, both

TABLE 5
Rankings in Attitudes for All Groups

Male Teens	Female Teens	Male Seniors	Female Seniors
	Pretest		
Female Teens	Female Teens	Male Seniors	Female Seniors
Female Seniors	Female Seniors	Female Seniors	Female Teens
Male Seniors	Male Seniors	Female Teens	Male Seniors
Male Teens	Male Teens	Male Teens	Male Teens
	Posttest		
Male Seniors	Male Seniors	Male Seniors	Male Seniors
Female Seniors	Female Seniors	Female Teens	Female Seniors
Female Teens	Female Teens	Female Seniors	Female Teens
Male Teens	Male Teens	Male Teens	Male Teens

TABLE 6
Means and Standard Deviations for All Groups: Attitudes Toward Male Teens

		Attitudes of							
		Male Teens		Female Teens		Male Seniors		Female Seniors	
Subscale	Test	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Goodness	Pre	3.90	0.59	3.38	0.99	4.17	0.85	4.70	1.19
	Post	3.66	0.54	2.89	0.57	5.46	0.43	5.36	0.83
Positiveness	Pre	4.47	0.58	4.85	0.90	4.77	0.66	5.43	0.96
	Post	4.58	0.66	4.64	0.73	5.37	0.40	5.63	0.86
Vitality	Pre	4.80	0.79	5.43	0.57	4.69	0.62	5.32	0.83
	Post	5.06	0.62	5.47	0.68	5.34	0.73	5.29	0.59
Maturity	Pre	3.33	0.60	3.16	0.93	3.31	0.82	4.16	1.21
	Post	3.15	0.37	2.94	0.69	4.57	0.30	4.36	0.61

before and after singing in the intergenerational chorus, are reported in Table 6. Mean evaluations of male teens' perceptions of themselves increased in the two subscales of Positiveness and Vitality, but not with regard to Goodness and Maturity. Assessments of female teens were substantially lower with regard to Goodness, Positiveness, and Maturity, but higher in the category of Vitality. Mean evaluations for male teens increased for all subscales in the perceptions of male seniors. Female seniors' evaluations increased for every scale but Vitality.

All attitude scores were evaluated using t test procedures. These tests indicated no overall significant difference between scores received on pretest assessments and those received on posttest assessments from the choir as a whole. Male teens were, however, rated significantly higher on the subscales of Goodness ($t = 3.05$, $df = 9$, $p = .014$) and Maturity ($t = 3.53$, $df = 9$, $p = .006$) by the senior males.

Means and standard deviations for all groups' attitudes toward female teens, both before and after singing in the intergenerational chorus, are reported in Table 7. Mean evaluations of male and female teens showed a marked decrease for all subscales, with the exception of the male teens' assessment of Vitality. Senior males, conversely, showed an increase for all subscales. Senior females showed an increase in all subscales except Vitality.

Results of analyzing pretest and posttest attitudes indicated

TABLE 7

Means and Standard Deviations for All Groups: Attitudes Toward Female Teens

		Attitudes of							
		Male Teens		Female Teens		Male Seniors		Female Seniors	
Subscale	Test	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Goodness	Pre	4.77	0.60	5.32	0.62	4.48	1.19	5.49	0.73
	Post	4.62	0.82	4.67	0.90	5.83	0.63	5.51	0.91
Positiveness	Pre	5.02	0.32	5.65	0.62	4.79	1.33	5.64	0.73
	Post	4.79	0.71	5.54	0.72	5.71	0.32	5.75	0.78
Vitality	Pre	4.40	0.44	5.06	0.70	4.32	0.85	5.40	0.77
	Post	4.70	0.40	4.97	1.01	5.09	0.54	5.29	0.76
Maturity	Pre	4.00	0.66	4.34	0.91	3.93	0.90	4.41	0.73
	Post	3.76	0.80	3.71	1.12	4.89	0.63	4.84	0.71

no significant differences between scores received on overall pretest assessments and those received on overall posttest assessments from the choir. Differences between pre and posttest evaluations were found in two subscales. Female teens rated themselves significantly lower with regard to Goodness (t = 2.18, df = 25, p = .039). In contrast, male seniors rated the female teens significantly higher on that same subscale (t = 2.28, df = 9, p = .049).

Means and standard deviations for all age and gender groups concerning their attitudes toward male seniors are reported in Table 8. Mean evaluations for male seniors increased for all subscales in the perceptions of all groups.

Examination of the change in attitudes from pretest to posttest indicated that overall attitudes toward male seniors were significantly improved (t = 4.81, df = 33, p = .001). Attitudes of male teens were significantly higher with regard to the subscales of Positiveness (t = 2.45, df = 22, $p < .05$) and Maturity (t = 3.42, df = 23, $p < .01$). Male seniors registered significant changes in attitudes with regard to the subscales of Positiveness (t = 2.55, df = 9, $p < .05$) and Vitality (t = 2.82, df = 8, $p < .05$). No significant differences were found within any subscales for either the female teens or female seniors.

Means and standard deviations for all groups' attitudes toward female seniors are reported in Table 9. Mean evaluations

TABLE 8

Means and Standard Deviations for All Groups: Attitudes Toward Male Seniors

		Attitudes of							
		Male Teens		Female Teens		Male Seniors		Female Seniors	
Subscale	Test	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Goodness	Pre	5.24	1.10	5.40	1.03	5.19	0.69	5.20	0.98
	Post	5.83	0.66	6.08	0.61	5.48	0.62	5.64	1.01
Positiveness	Pre	4.54	0.69	4.71	1.10	5.05	0.60	5.12	1.14
	Post	5.20	0.63	5.22	1.28	5.77	0.19	5.69	0.85
Vitality	Pre	4.19	0.49	4.31	0.88	4.83	0.42	5.10	1.07
	Post	4.45	0.60	4.68	0.77	5.71	0.56	5.14	0.79
Maturity	Pre	3.96	0.57	4.46	1.15	4.60	0.57	4.55	1.14
	Post	4.73	0.55	5.13	1.12	4.95	0.73	5.07	0.80

for female teens showed a decrease for the subscales of Goodness and Maturity, but not for Positiveness or Vitality. Senior females showed an increase only on the subscale of Vitality. Teen and senior males showed an increase in all subscales.

Differences between pretest and posttest attitudes were examined, with improved overall attitudes toward female seniors approaching significance ($t = 2.03$, $df = 35$, $p = .051$). However, improvement in male teens' attitudes toward female seniors was significantly higher on the subscales of Positiveness ($t = 2.17$, $df = 22$, $p = .041$) and Vitality ($t = 3.13$, $df = 23$, $p = .005$). Female teens also rated the female seniors significantly higher on the subscale of Vitality ($t = 2.42$, $df = 24$, $p = .023$).

Discussion

The purpose of the present study was to examine the effect of participation in an intergenerational choir on teens' and older persons' cross-age attitudes. Results of the posttest indicated that attitudes of male and female teen subjects toward themselves and each other moved in a negative direction from pretest to posttest. It would appear that social contact did not improve male and female teens' attitudes toward each other; however, their attitude toward the seniors, both males and females, moved in a positive direction from pretest to posttest. This finding

TABLE 9

Means and Standard Deviations for All Groups: Attitudes Toward Female Seniors

		Attitudes of							
		Male Teens		Female Teens		Male Seniors		Female Seniors	
Subscale	Test	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Goodness	Pre	5.70	0.86	6.22	0.63	5.62	0.81	5.89	0.80
	Post	5.93	0.83	5.90	1.01	5.91	0.41	5.85	0.90
Positiveness	Pre	4.52	1.00	4.91	1.25	4.93	1.16	5.52	0.91
	Post	5.29	0.69	5.40	0.92	5.60	0.41	5.43	0.81
Vitality	Pre	3.40	0.68	3.69	1.01	4.31	0.84	4.78	0.92
	Post	4.05	0.25	4.61	0.89	4.49	1.03	4.95	0.67
Maturity	Pre	4.76	0.75	5.39	0.89	4.77	1.04	5.23	0.78
	Post	4.94	0.96	5.16	1.23	5.34	0.70	5.19	0.68

supports previous research which indicates that quality interactions can affect attitudes toward older persons. The music setting provides an enjoyable environment, and because of the nature of ensemble work, one that requires interaction and cooperation.

The attitudes of the male and female senior subjects could be described as generalized positive; their attitudes toward teens and toward themselves were overall more positive and increased in positiveness from pretest to posttest. The attitudes of the male seniors indicated the most positive change; furthermore, attitudes toward male seniors reflected a greater positive change than attitudes toward any of the other three groups. It is possible that their general positive attitude toward others was self-reflective.

Seniors, both male and female, were overall more positive than teens toward all four groups. Because the seniors had participated in such a group previously, it may be that this prior experience predisposed them to view other participants more positively. Braithwaite (1986) found older persons to be characterized as "more concerned for others" than their younger counterparts. If this description is true, the seniors' positive attitude could be viewed as a general age-group attribute. Subscale data (Tables 5–9) support additional age-related characteristics. Seniors generally received higher scores on the "Ma-

turity" and "Goodness" subscales. Teen males and females generally received higher scores on the "Vitality" subscale.

When pretest mean scores were ranked from positive to negative, three of the four groups ranked their own age and gender group the most positively; however, on the posttest, all groups ranked senior males the most positively. These data indicate that same-gender/age biases can be altered by programmed social interaction. These data also support contradictions found in other studies related to gender issues (Braithwaite, 1986; Eisdofer & Altrocchi, 1961; O'Connell & Rotter, 1979; Walsh & Connor, 1979). The ranking data in Table 5 also show that teen males were viewed more negatively than any of the other three groups, thus discounting a gender bias toward males in general. Pretest as well as posttest rankings placed teen males at the bottom for all groups, including their own.

It is important to note that the seniors in this study were healthy elderly. Giving teens the opportunity to interact with the well elderly helps to dispel the myths that characterize older persons as being in poor health, lonely, and failing in mental and physical health. Only a small percentage, approximately five percent, of the elderly population is dependent and in need of care.

The findings of this study are promising. It seems possible that intergenerational programming can serve as a viable means of communication between generations. Because the extended family is less intact today, many young people do not know their grandparents; and because of the mobility of today's society, older persons often become estranged from their children and grandchildren. The surrogate relationships that frequently develop through intergenerational activities can fulfill a need for family contact and dissuade isolation.

Participation in intergenerational music organizations can also be an educational experience. Participation by older persons allows them to learn or relearn musical skills. Retirement often provides the time to maintain or develop musical performance skills and to schedule regular practice time. Making music with older persons also allows young people to grow musically. They can expand their musical repertoire and become acquainted with the music of another era. The intergenerational choir can provide an opportunity for personal and musical growth, es-

tablishing meaningful relationships, dismissing stereotypes or prejudice, and modifying negative attitudes. It seems possible that music, along with the experience of age and the enthusiasm of youth, can help to bridge the generation gap.

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Audio-Cueing and Immediate Feedback to Improve Group Leadership Skills: A Live Supervision Model

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The purpose of this study was to evaluate the effects of audio-cueing and immediate feedback on the leadership skills of student music therapists. The study consisted of four sub-studies using the same dependent and independent variables, and similar designs with variation in the amount of time spent in baseline, treatment, and return-to-baseline phases. A total of 12 student therapists participated in this study, which lasted approximately 4 months. The independent variable was instructor feedback, delivered to the student therapist by way of an earpiece attached to a wireless receiver which was concealed under the student's clothing. The feedback consisted of verbal approvals or disapprovals for specific interventions, general encouragement for session progress, and directions for immediate action. The dependent measure was the Standley Group Activity Leadership Skills Checklist. Subscores can be calculated in four areas: personal skills, general session skills, music skills, and client responses. The supervisor used the checklist, while viewing the videotapes, to evaluate the progress of each student therapist. Results from this study do not show a clear enough distinction between the pattern of the baseline scores and the students' scores during treatment to make conclusions about the effects of the treatment interventions, since there was no immediate or dramatic change from baseline to treatment scores when the intervention was applied. The students did improve in the areas of giving specific approvals to clients, helping the clients participate in the activities, and in body proximity to the clients when they were given immediate feedback from the supervisor. These important skills can be enhanced and reinforced through live supervision techniques.

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Effective supervision of future teachers and therapists is a topic of interest and concern to educators. Methods of supervision vary depending on the situation and personnel involved. Research has indicated that practice teaching opportunities and performance feedback positively affect teaching skills (O'Leary & O'Leary, 1976). The relationship of feedback during practice teaching/therapy and skill acquisition and development situations has been the focus of several articles (Alley, 1978; Andersen, 1982; DeCuir & Jacobs, 1990; Freiberg & Waxman, 1988; Mackey, 1989; Prickett, 1987). Music therapy literature indicates the desirability of training specific competencies, defined as overt, skilled behaviors (Madsen & Yarbrough, 1980). Videotape as feedback has been shown to be effective in developing these competencies (Furman, 1987; Greenfield, 1978; Moore, 1976). The quality of feedback in music therapy preinternship clinical experiences is important to the development of the therapist trainee (Gault, 1978).

Similarities exist between the training of teachers and the training of therapists. Academic work, pre-internship training, and full-time internship or student teaching situations are integral components of teacher or therapist training programs. Feedback varies by situation and personnel involved, yet it remains an important feature in the training process.

Feedback in Teacher Education

Feedback in teacher education has been the topic of research for many years. Several different systems of delayed and immediate feedback have been studied to determine effectiveness of the varied approaches (Allen & Forman, 1984). Maintenance and generalization of skills were found to be the major issues in feedback related to training teachers, with frequent feedback more effective than daily feedback. These concepts should be built in to teacher training courses, via frequent and specific feedback, rather than left to chance.

Feedback in Field Placement/Student Teaching

Preservice field placements and student teaching placements supply the student teacher with valuable, real life, hands-on experience working in a classroom with students. Feedback from a variety of professionals enhances the experience for the

student teacher. Surveys of teacher training research have indicated that teaching skills are positively affected by practice teaching opportunities and feedback on performance (O'Leary & O'Leary, 1976). The role of the university supervisor is also important during this period. One of the most important jobs of the supervisor is to deliver evaluative feedback and support throughout the field placement (Johnson, 1987).

Becher and Ade (1982) evaluated the relationship of field placement characteristics, including feedback, and the students' potential field performance abilities scores with students' final clinical performance scores. The feedback characteristic referred to useful and necessary information from the cooperating teacher to each student to enhance the student's development as a teacher. According to the study, good placement sites have frequent observations by the cooperating teacher and conferences with the student to provide feedback on both strengths and weaknesses. Results indicated that students who received more feedback were more likely to have high final performance scores than those students who received less feedback. The feedback was especially important for the lower functioning student teachers to achieve success in field placements and student teaching.

Feedback from pupils, feedback from systematic classroom observations, and self-analysis of lessons are three methods for providing feedback that show potential for improving classroom instruction by preservice teachers (Freiberg & Waxman, 1988). Student teachers who participated in observation training and received systematic feedback based on this training improved their teaching effectiveness and reported greater self-confidence and control (Freiberg, Waxman, & Houston, 1987). Self-assessments can be a useful feedback device if preservice teachers are provided with an accurate tool to measure their teaching skills. Accurate self-awareness of teaching skills can help preservice teachers gain better control over their actions and increase their potential for change and growth (Briggs, Richardson, & Sefzik, 1986; Freiberg, 1987).

The Use of Audio/Videotaping—Delayed Feedback

Results from a study about feedback effectiveness (Lhyle & Kulhavy, 1987) support a depth-of-processing view of feedback

effectiveness, that is, that deeper processing is associated with the probability of higher recall. Learners who are required to semantically analyze feedback after making an error should have a better chance to make a correct response in the future. Procedures that increase the amount of learner feedback processing, such as analysis of audio or videotaping feedback, increase the effectiveness of the feedback itself.

Audiotaping has been successfully used to provide feedback to preservice teachers concerning specific pinpointed behaviors (Horton, 1975). A review of the research literature exploring the effectiveness of video technology in teacher education indicated a positive outlook (Frager, 1985; Fuller & Manning, 1973). Most studies validated specific uses for videotape recording and playback in the education of future teachers. Supervisors of all levels of teachers can use videotape feedback as a tool to effectively train teachers in observation skills and teaching techniques (McConnell & Fages, 1980; Saudargas, 1972; Yeany & Padilla, 1986). The preservice teacher becomes an active participant in the evaluation process when videotaping is used as a supervisory tool (Chance & Krajewski, 1988).

Preservice teachers can observe and evaluate their behaviors through self-analysis of the videotape. Teachers can recall particular emotions that occurred prior to certain behaviors when viewing the session on tape, and can examine the outcomes related to those feelings and behaviors. A feedback session can be scheduled at a later, more convenient time, allowing for adequate time for the analysis process with the student and supervisor. Krajewski (1976) found that an experimental group of teachers who had been videotaped and self-analyzed their tapes exhibited better teaching procedures and were more accurate in their self-analysis than a control group. Videotaped teachers talked less, used more student ideas during class, and praised their students at a higher frequency than students who were not videotaped.

Killian (1981) found no significant difference in music teaching skill attainment or attitude for preservice elementary education majors in a music methods course when different feedback systems were used. Feedback conditions included systematic self-observation of videotaped sessions, unguided videotape self-observation, and verbal feedback from the in-

structor without the use of videotape observations. Although there were no significant differences in skill attainment among the three feedback conditions, students participating in any of the feedback conditions did better than students in the no feedback control group.

Rule (1972) examined the effects of three different techniques for modifying teachers' behavior: instructions plus feedback, videotaped feedback, and direct intervention. Results were variable for the instructions with feedback and videotaped conditions. No predictable change occurred as a result of the instructions with feedback condition. The videotape feedback condition produced positive results in about half of the sessions. The direct intervention method offered immediate, on-the-spot feedback with a continuation of the session. The teacher trainee was able to see the results of appropriate teaching behaviors and the consequences of those behaviors, specifically an increase of appropriate student behaviors.

Furman (1987) evaluated the effects of four different feedback conditions on students' development of song leading with guitar accompaniment skills. The feedback conditions included a behavior checklist, videotape replay, checklist and videotape replay, and general instruction feedback (contact control group). Posttest results indicated significantly higher scores on the behavior checklist and song leading scores for the checklist only and the videotape and checklist groups. No significant differences were found among any of the groups on musical accuracy. Participants reported a positive attitude toward being videotaped. In another study (Hanser & Furman, 1980), no difference was found on the development of clinical music therapy skills between the videotape-based feedback and the field-based feedback. Researchers found that, regardless of the feedback condition, the students improved at a greater rate during the second half of the semester than they did during the first half.

Independent student self-analysis of videotaped music therapy sessions was an effective way to increase students' clinical skills (Alley, 1980). Subjects trained using operationally defined definitions and videotape analysis developed skills better than subjects who did not have the same training (Alley, 1982). Students were able to transfer and maintain on the existing skill level when leading sessions in novel clinical settings. The author

noted that, although one-to-one instructor feedback may be an inefficient use of faculty time, students enjoy the interactions with instructors.

Undergraduate music conducting students participated in a study to determine the relationship of behavioral self-assessment to the achievement of basic conducting skills (Yarbrough, 1987). Students viewed videotapes of themselves during conducting practicum sessions and rated themselves using observation forms and written self-critiques. Target conducting skills were operationally defined prior to the sessions. Results indicated a significant positive correlation between correct self-evaluation marks and posttest scores. Also, a nonsignificant but positive correlation was found between verbal self-reinforcements and correct posttest scores.

Piercy and Sprenkle (1986) cited some advantages of delayed feedback, that is, feedback given at the end of a session. Delayed feedback gives the therapist the opportunity to lead the session alone, which could possibly lead to increased feelings of self-confidence, independence, and accomplishment. It also facilitates transitions to therapy settings where having live supervision is not possible or practical.

The Use of Visual/Written Cues—Immediate Feedback

Visual cues have been used to modify behavior or accelerate learning in some varied educational settings. Direct intervention techniques using lights during a session include contingent light signals (Greenfield, 1980) and lights as a cue (Wahler, Winkel, Peterson, & Morrison, 1965). Light cues were used to modify the classroom behavior of a 9-year-old boy with hyperactivity (Patterson, 1965). Visual cueing has been used effectively to train teachers in the use of social reinforcement theory (Hall, Lund, & Jackson, 1968). After a period of time, most of the teachers were able to reinforce appropriate student behavior without the visual cue.

Frequent written feedback to teacher trainees has been used to help them develop the skill of reinforcing appropriate behaviors and increase positive teacher attention to the students in the class (Cooper, Thomson, & Baer, 1970; Parsonson, Baer & Baer, 1974). Televised graphic feedback and verbal explanations of the feedback have positively affected the acquisition

of teaching skills (DeWulf, Biery, & Stowitschek, 1987). The best results were found with the combination of televised graphic feedback, verbal labeling, explanation of successive graph categories, indirect modeling, and experimenter praise.

The Use of Audio-Cueing—Immediate Feedback

Researchers in teacher education have experimented with audio-cueing as an approach to teach new skills or train specific behaviors. Several types of audio-cueing devices, including prerecorded beeps and messages on microcassette recorder or beeps over a public address system, have been used to elicit responses in students and teacher trainees during actual classroom sessions (Coleman & Toth, 1970; Glynn & Thomas, 1974; O'Pry & Pease, 1987; Van der Mars, 1987; Van Houten & Sullivan, 1975).

Reports of live supervision with immediate feedback in teacher education are minimal. Some researchers have conducted small studies to determine the effectiveness and viability of using a "bug-in-the-ear" (BIE) in the classroom (Bowles & Nelson, 1976; Coleman, 1970; Herold, Ramirez, & Newkirk, 1971; Patterson, Jones, Whittier, & Wright, 1965; Thomson & Cooper, 1969; Tramontana, 1971). Auditory prompting systems were described in a review by Schwitzgebel (1968) of 50 electromechanical devices used for behavior modification. The BIE device was described as being useful to train students learning interviewing skills and psychological testing skills, as well as to train parents and teachers in behavior modification techniques.

The earliest report of the use of the BIE for supervision was not in teacher education but in the training of psychologists. In 1952 Korner and Brown (1952) described a device they called a "mechanical third ear" to assist in the supervision of psychology students and interns. Initially they used a device which connected the student's receiver to the supervisor's transmitter by a wire concealed under the coat. Later they used a miniature, wireless radio receiver that provided more range of movement for the student. The "third ear" device was found to be useful in psychological and projective testing situations and face-to-face counseling sessions. All of the students and interns in the program thought that the "third ear" was useful in their learning experience. Students advised the supervisors to keep instructions short and not wordy, and not to expect them to use direct

quotes from the supervisors. The students became more adept at using the "third ear" after one or two sessions. Practice with the device made it easier for the students to listen to the client and the supervisor during the session.

The advantages of a portable radio communication system for teacher education were described by Herold, Ramirez, and Newkirk (1971). Specifically, immediate feedback during supervision was described as a way to greatly enhance the effectiveness of trainers and supervisors. In order to be effective, the supervisor must be sensitive to the teacher's feelings about being prompted during class session. Also, predetermined behaviorally defined objectives should be agreed upon by the teacher and supervisor before implementation of any live supervision procedures. Teachers and supervisors received the use of the cueing system with enthusiasm, and suggested that this system appears to be very well suited for clinical training programs in addition to teacher education.

Cohn (1973) made the following suggestions for using an immediate feedback device in a supervisory/training situation:

1. The counselor and supervisor should know the goals of the session.
2. Both should be comfortable with the use of the equipment and terminology used. Practice sessions should be held to facilitate the procedure.
3. The supervisor must make clear, concise statements at times when the student can be most attentive.
4. Comments must be restricted to and focused on the process and techniques encountered in the session.

The primary value of this approach comes from the opportunity for immediate feedback and on the spot error correction. The supervisor is available to help if the student has difficulty during the session or class period. The use of the BIE can prevent misinterpretations and misunderstandings which may occur with only verbal instructions or post hoc feedback.

Live Supervision in Family Therapy Training

Supervision of one's work with families is thought to be one of the most effective, potent learning experiences for a family therapy trainee. There are many, varied approaches to family

therapy supervision. Traditionally, the supervisor and trainee participated in individual supervisory and feedback sessions where written process notes of the therapy session were reviewed. Currently, group supervision seminars are more common, relying heavily on peer group teaching and influence. Group supervision seminars frequently utilize videotapes of family therapy sessions for the basis of discussion (Levant, 1984).

With the advent of the one-way mirror in the 1950s, supervisors and researchers have been able to observe live sessions without being obtrusive. The one-way mirror added a new dimension to the supervisor's comprehension of the interactions between the family members and the therapist. The field of family therapy has for many years widely accepted the concept of cotherapists (Lambert, 1989; Young, 1989), where one cotherapist is behind a mirror and communicates with the partner during the session. The supervisor is better able to observe developing patterns and think about interventions more objectively than the therapist who is directly intervening with the family (Goldenberg & Goldenberg, 1991).

Live supervision in family therapy generally refers to a situation in which a supervisor observes a family therapist or therapist trainee while the therapist works with a family. The supervisor usually observes from behind a one-way mirror, but in some cases is in the room with the family and therapist during the session. The therapist or therapist trainee is actively guided by the supervisor who interrupts the session when it seems necessary. The supervisor then consults with the therapist on the progress of the session and suggests intervention strategies (Kaplan, 1987). A basic assumption in live supervision is that a family in therapy can redirect the therapist trainee from the role of change agent to behaving in ways which reinforce the behavior patterns that created the dysfunction within the family. An experienced supervisor, distanced from the situation, can more readily see this occurring and can advise the trainee to correct the behaviors as they happen. Live supervision teaches an inexperienced therapist trainee how to effectively work with families, and protects client families from ineffective, incompetent therapeutic practices (Goldenberg & Goldenberg, 1991).

The rationale for using live supervision includes protecting clients from inexperienced and incompetent therapists (Haley,

1976); enabling the immediate correction and/or avoidance of major problems during therapy; lessening the gap between the therapist's self-report and what actually happened during the session (Montalvo, 1973); and enabling the supervisor to intervene immediately throughout the therapeutic process (Kaplan, 1987). Prior to the use of live supervision, the therapist trainee would facilitate the session independently and report about the session to the supervisor at a later time. Time lapsed between the actual session and the feedback session with the supervisor could be minutes, hours, or even days. The supervisor then had to base feedback on the memories and perceptions that the trainee had of the session. Live supervision eliminates that time gap and gives the supervisor a more accurate, precise view of the therapeutic process within the session.

Methods of Live Supervision

Live supervision is often used in family therapy training that has an orientation towards structure/process theories. Frequently, a supervisor will prearrange to provide immediate feedback to a trainee during the session. The feedback can be delivered in one of many ways: (a) the use of a telephone for "phone ins;" (b) the supervisor enters the room to consult face-to-face with the therapist trainee; (c) the therapist trainee leaves the room to seek out advice from the supervisor; (d) a BIE device is used to transmit feedback unobtrusively (Birchler, 1975); (e) the supervisor and/or supervisory team sit in the room with the therapist and family during the session (Landau & Stanton, 1983); and (f) a walkie-talkie system or CB radio system is used to transmit feedback (Birchler, 1975).

The most common problem with live supervision reported by students (Kaplan, 1987) was anxiety at the beginning of the live supervision process. Most stated fears of being observed, evaluated, and judged. Also, fears of not being competent in the situation were cited frequently. Most reports stated that these initial fears diminished and students became more relaxed and excited about the supervision. Other common problems among students were personal difficulty with authority, understanding lengthy or complicated phone-in messages, and feeling too dependent on the supervisor for direction.

Kaplan reported few common problems mentioned by su-

pervisors. One respondent mentioned as a problem the intensity of the situation where one is trying to guide the trainee, move the family along in therapy, and possibly discuss the process with other observers all simultaneously. Other issues mentioned as problems were: (a) achieving a balance of interventions, not too many or too few; (b) helping the students relax; and (c) properly timing the interruptions during the session.

Live supervision is pervasively accepted in university and private institute family therapy training programs (Kaplan, 1987; McKenzie, Atkinson, Quinn, & Heath, 1986). Instant feedback and support of the therapist trainee makes live supervision an effective means of facilitating training.

Use of the BIE in Family Therapy Training

The BIE device is thought by some to be one of the best tools to facilitate the supervision process in family therapy training (Byng-Hall, 1982). One reason for the popularity of the device is that the trainee's interventions resemble ordinary therapy because the flow of the session is not interrupted by a telephone or pull-out conference. The trainee experiences the effect of the intervention immediately, which can facilitate learning more quickly than reading about or discussing a technique and cautiously trying it at a later date. The supervisor can add to the intensity of the session by making suggestions for more impactful interventions. The distance provided by the one-way mirror also gives the supervisor a clear vantage point to determine if the trainee is becoming enmeshed in the family's dysfunctional behaviors, focusing too much on one family member, or missing physical cues being given by family members. The supervisor can make the trainee aware of these observations and make suggestions for more effective interventions.

There are also disadvantages to using the BIE, primarily stemming from the fact that it is a powerful, influential device that is easy to use. Byng-Hall (1982) warns against "echo therapy" where the trainee simply parrots what the supervisor says. The supervisor can get caught up in the therapeutic process and come close to becoming the therapist. It takes practice and skill, plus a high level of concentration and attention to detail, to use the device as an effective supervisory tool. Another issue to deal with is the experience level of the trainee using the

device. It is important that trainees speak in their own words to avoid negative feelings toward the supervisor for invasion of autonomy.

Before implementing use of the BIE in actual therapy sessions, it is important to use it in role play situations to familiarize the student with the experience. Once the trainee is comfortable with the earphone and is ready to use it in a session, the family usually will be comfortable with it and will need minimal discussion about its use after a brief explanation (Byng-Hall, 1982).

The supervisor can use the device to offer a variety of interventions, such as specific instructions of what to do or suggested strategies along predetermined lines. The trainee can be made more aware of the family's behaviors, be given messages from other observers behind the glass, or be given encouragement for doing something well. Intensity of the session can be increased or decreased via supervisory suggestions. It is of utmost importance to adjust the style of communication to the individual trainee and to be sensitive to the trainee's experience level. The BIE is especially effective in the beginning stages of training with inexperienced, possibly naive therapist trainees. Use of the device lessens as the therapist trainees become more experienced and effective on their own. Suggestions from the supervisor are usually frequent and specific with a beginning therapist trainee, and much less frequent and more broad to the experienced therapist trainee (Byng-Hall, 1982).

Not everyone agrees with frequent use of the device. Haley (1976) cautions against over-use of the BIE procedure with family therapy trainees. He recommends that the supervisor use the intervention sparingly, and offer only one or two specific comments or suggestions during the session.

Reactions to the BIE vary greatly. Trainees who participated in live supervision with the device (Lowenstein & Reder, 1982) agreed with the commonly stated problems about its use, and added that the device, if used insensitively, can foster the illusion that the message given by the supervisor is the only right message for that particular situation. Despite their reservations, Lowenstein and Reder found that if the BIE is used with sensitivity, mutual trust, and respect, it can be a challenging and effective learning tool. The discomforts might be justified by the accelerated learning that takes place using its method of live supervision.

Disadvantages and Advantages of Live Supervision

Live supervision is a complex teaching method that may provide many pitfalls and problems for the inexperienced or naive supervisor. The trainees' experience with live supervision could be a highlight or lowpoint of their training, depending on the supervisor's awareness of the potential problems and skill in avoiding them or dealing with them as they arise. A major disadvantage of live supervision is the added amount of stress felt by the therapist trainee. Schwartz, Liddle, and Breunlin (1988) caution supervisors to be sensitive to the experience of the trainee. It is possible for the supervisor to facilitate robotization of the trainee during live supervision. The trainee then becomes little more than the mouthpiece for the supervisor, mechanically implementing the supervisor's interventions. When this happens, the trainee develops little or no creativity, initiative, or problem-solving skills within the session. It also might be difficult for the trainee to conceptualize the nature of the interventions when the direction of the session is led entirely by the supervisor.

Live supervision, in whatever form, has many advantages. The primary advantages lie in the ability of the supervisor to immediately influence the therapeutic interactions. If the supervisor is behind a one-way mirror, the distance from the situation can provide a different perspective from which to make suggestions. Also, the supervisor is able to observe patterns occurring during the session and suggest ways that the therapist trainee might be playing into the family's dysfunctional behaviors. Ethical objections to live supervision noted earlier in its use are currently of less concern (Piercy & Sprenkle, 1986).

Purpose

The purpose of this study was to evaluate the effects of audiocueing and immediate feedback on the group leadership skills of student music therapists. An auditory feedback device was used to transmit feedback from the supervisor to student therapists during live supervision of music therapy sessions. This device has proven to be effective in earlier music therapy clinical studies (Furman, 1991; Furman, Adamek, & Furman, 1992), and is frequently used in the training of family therapists.

To determine the effectiveness and practicality of using an

immediate feedback device during live supervision of music therapy students, the following questions were considered in this study:

1. Will the use of audio-cueing and immediate feedback lead to student therapists' improved performance in leading music therapy groups, as measured by scores on the Standley Group Leadership Checklist?
2. Will the students' scores on the Standley Group Leadership Checklist remain at the same level after treatment procedures, during the withdrawal of treatment, or will they return to the previous level of the initial baseline scores?
3. What are the reactions of the participants to the use of the immediate feedback device during live supervision?
4. Do the students' self-scores on the Standley Group Leadership Checklist agree with the supervisors' scores for the students?

Method

This study consisted of four substudies using the same dependent and independent variables, and similar designs with variations in the amount of time spent in baseline, treatment, and return to baseline phases. The project was completed during two 10-week academic quarters and lasted approximately 4 months. The number of student therapist participants and the number of sessions observed varied among the four substudies. Also, the membership of the client groups were different for each substudy.

Subjects

Twelve music therapy students, eleven female and one male, enrolled in two consecutive academic quarters of a music therapy practicum course participated in the study. The students are identified in the study as students A through L. All of the students had previous experience working with clients in a supervised music therapy practicum setting and were of at least junior standing in the university.

Procedures

The music therapy laboratory at the University of Minnesota was the setting for this project. Adjacent to the laboratory was

an observation room that was equipped with a one-way mirror and speakers which allowed the supervisor to hear all interactions that occurred during the sessions. The supervisor viewed all of the music therapy sessions from the observation room. Sessions were held two times per week for 30–40 minutes per session. Each of the student therapists led at least one activity during each session, then functioned as cotherapist for the remainder of the session. The students were assisted in choosing pinpointed behaviors to focus on with their clients and were given activity suggestions by the practicum supervisor. Sessions were independently planned by the students as to content, order of activities, designated leader, and designated data collector for each session. All sessions were videotaped and the students were directed to view the videotape before the next session. The practicum supervisor gave face-to-face feedback to the entire group in the music therapy laboratory at the end of each session. Membership in the client groups remained intact for an entire academic quarter and student therapists worked with the same group or individual client for an entire academic quarter.

Independent Variable

The independent variable was feedback from the supervisor delivered to the students via a battery powered wireless listening system used for one-way communication. Sound was transmitted by an FM radio signal from one person to another or from one person to a group of people. The supervisor wore the small, belt pack transmitter (Williams Sound Corporation, Tour Guide Transmitter, TGS T7) and a headset microphone (Williams Sound Corporation, Noise-Canceling Headset Microphone, MIC 015) or an omnidirectional lapel clip microphone (Williams Sound Corporation, Lapel Clip Microphone, MIC 021). The student therapists wore a lightweight ear piece attached to a battery powered wireless receiver (Williams Sound Corporation, Tour Guide Receiver, TGS R7) in order to hear the supervisor's feedback when involved in the experimental condition. The receiver was pretuned to the FM frequency of the transmitter worn by the supervisor and had user-adjustable volume control and on/off switch. Whenever possible, the receiver and ear piece wire were concealed under the student's clothing. Only persons wearing the receiver and ear piece could hear

transmissions from the supervisor. Up to four student therapists were able to hear the supervisor's feedback at the same time, although this number could increase based on the number of receivers being used.

The immediate feedback given to the students by the supervisor consisted of approving verbal reinforcement (R+) for specific student therapist behaviors or general encouragement for tasks being performed, directions for immediate action pertaining to the leader or one of the cotherapists (Dir). Since use of this type of device tends to elicit far more directions than approvals from the instructor (Furman, 1991), a tally sheet was used by the supervisor to assist in balancing the type of feedback given during each session. It was found to be difficult, and not practical, to maintain a 4:1 ratio of approvals to directives, or positives to negatives, as might have been more desirable (Furman, Adamek, & Furman, 1992). Therefore, an equal balance (1:1) ratio of approvals to instructions was established as a target for balancing the feedback given by the supervisor.

Dependent Variable

The dependent variable was the Standley Group Activity Leadership Checklist #3 (Standley, 1991). The 93 items on the checklist, with a possible 100 points, are divided horizontally on the form in four sections: personal skills (20 points), general leadership skills (40 points), music skills (20 points), and client response (20 points). The personal skills section includes group leading skills related to posture, stance, proximity, and body language. The general leadership section includes skills related to the planning, preparation, implementation, and evaluation of the session. Music skills evaluated include accompanying, singing and playing in tune, proper use of steady beat, appropriate cueing in motor activities, and use of original or adapted music. The client response section relates to the clients' participation level and achievement of the objective. A set basal score is added to each section to weight that section in relation to the total checklist.

The items on the checklist are also divided vertically into three columns: deficiencies, which include behaviors that are omitted by the therapist or are performed poorly, or in some way diminish the effectiveness of the session; skills meeting

minimum criteria, which are basic skills for effective group leading; and skills above minimum criteria, which are behaviors that indicate more advanced or sophisticated group leadership skills. A check is placed on the form for all skills and deficiencies observed for each therapist. When minimum criteria are observed, the column to the right, skills above minimum criteria, can be considered for additional points. Points are then added for an overall score and a section by section score to determine the individual's strengths and weaknesses in group leading.

Design

A multiple baseline design was used for this study. Initial baseline observations were completed before any students received immediate feedback during the sessions. The number of baseline, treatment, and return to baseline sessions varied between each of the substudies.

Substudy 1. Four student therapists (A–D) participated in Substudy 1. The clients for this substudy were eight adults with mental retardation from a community rehabilitation center. After seven sessions of baseline observations, Student A wore the earpiece and received immediate feedback from the supervisor. Students B, C, and D began to receive immediate feedback at two-session intervals after the initial treatment implementation. The students continued to wear the earpieces and receive immediate feedback during the sessions until Session 21. No immediate feedback was given during Sessions 21–24, the return to baseline phase.

Substudy 2. Four student therapists (E–H) participated in Substudy 2. The clients for this substudy were eight adults with mental retardation from a community rehabilitation center. Student E was the first student in this substudy to receive immediate feedback starting in Session 8 and continuing through Session 21. Students F, G, and H received immediate feedback during Sessions 10, 12, and 14 respectively. A return to baseline phase and return to treatment phase was implemented for Students E and F. Students G and H dropped out of the study after Session 16 due to scheduling conflicts.

Substudy 3. Two student therapists (I and J) participated in Substudy 3. The client for this substudy was a 7-year-old boy with physical and cognitive disabilities. Immediate feedback

was implemented with Student I in Session 9, and in Session 14 with Student J. Return to baseline observations were made on the last two sessions, 19 and 20.

Substudy 4. Two student therapists (K and L) participated in Substudy 4. The client for this substudy was an 8-year-old boy with physical disabilities. Student K received immediate feedback beginning in Session 4, and Student L received immediate feedback beginning in Session 6. No return to baseline observations were made during this substudy.

Results

All of the student therapists improved during the course of the study. The group leadership scores increased and maintained at their highest levels during the experimental phase for each student (see Figures 1–4). A multiple baseline design demonstrates the effectiveness of an intervention when the changes in behavior occur when and only when the intervention is introduced and applied consistently (Kazdin, 1982). Results from this study do not show a clear enough distinction between the pattern of the baseline scores and the ultimate scores during treatment to make conclusions about the effects of the treatment interventions. The students' scores increased during the baseline period and continued to increase during the treatment phase. The students' scores remained at their highest points during treatment and return to baseline phases, but there was no immediate or dramatic change from baseline to treatment scores when the intervention was applied. Based on this information, a functional relationship between the independent variable, audio-cueing and immediate feedback, and the dependent variable, group leadership scores on the Standley Checklist, cannot be determined. It is possible that the students' increase in scores occurred due to practice and experience.

Discussion

All of the students' Standley Checklist scores were the lowest during the first few sessions of each substudy, and increased somewhat during baseline procedures. After the first two or three sessions, the students became acclimated to the group. They had more information about the functioning level of the group members, and were more confident in their own group

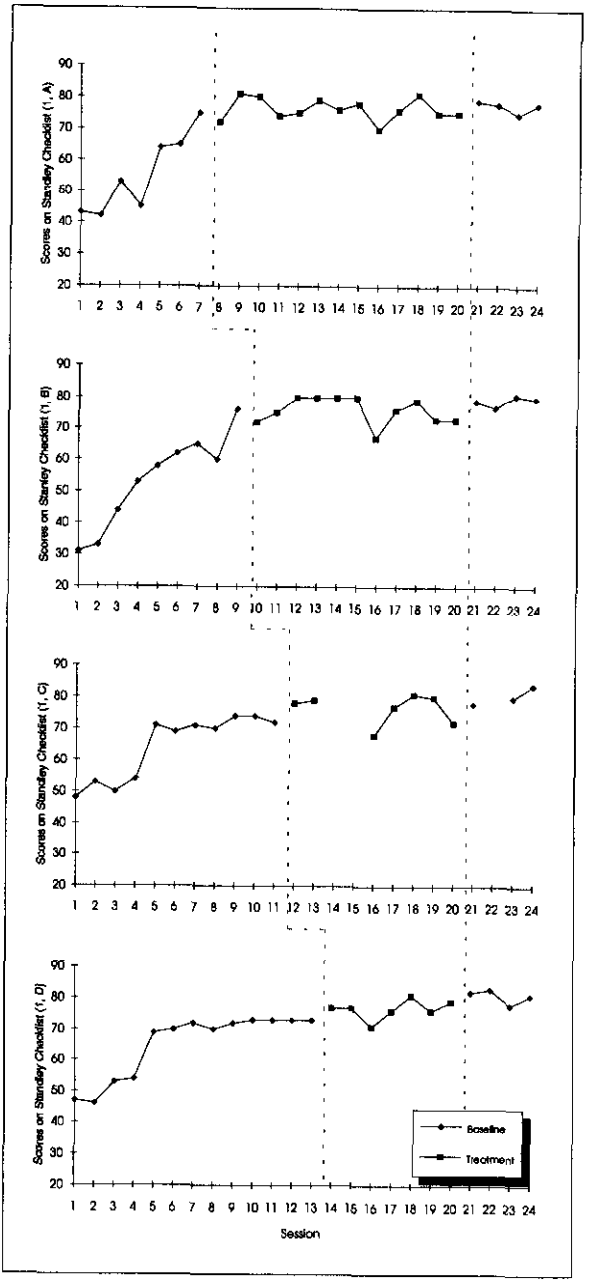

FIGURE 1.
Substudy 1.

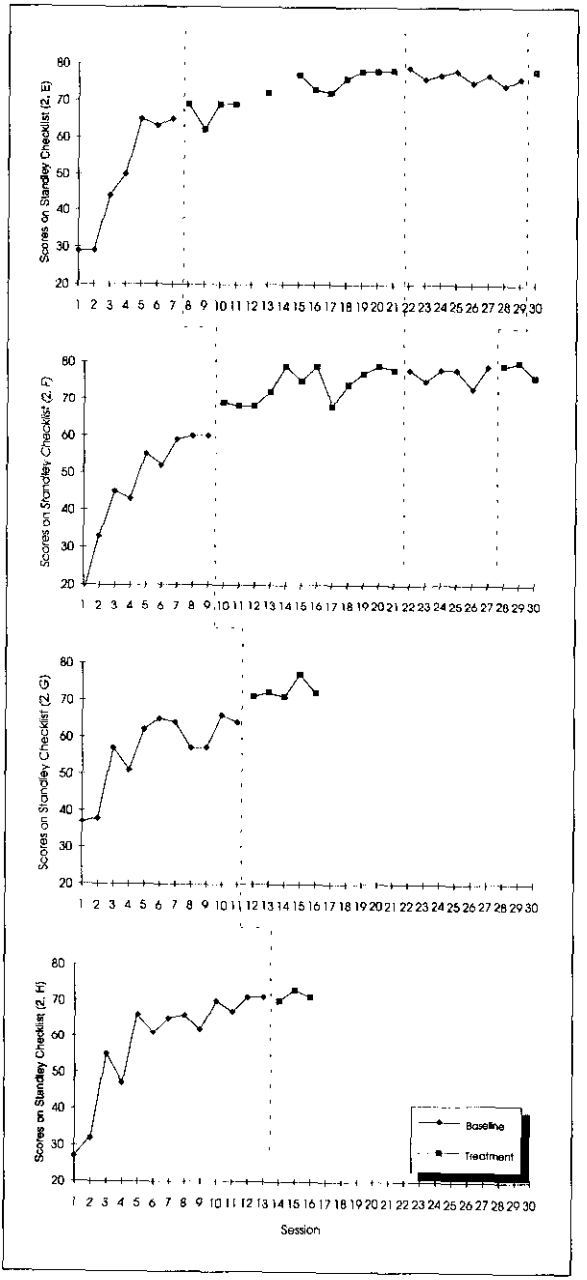

FIGURE 2.
Substudy 2.

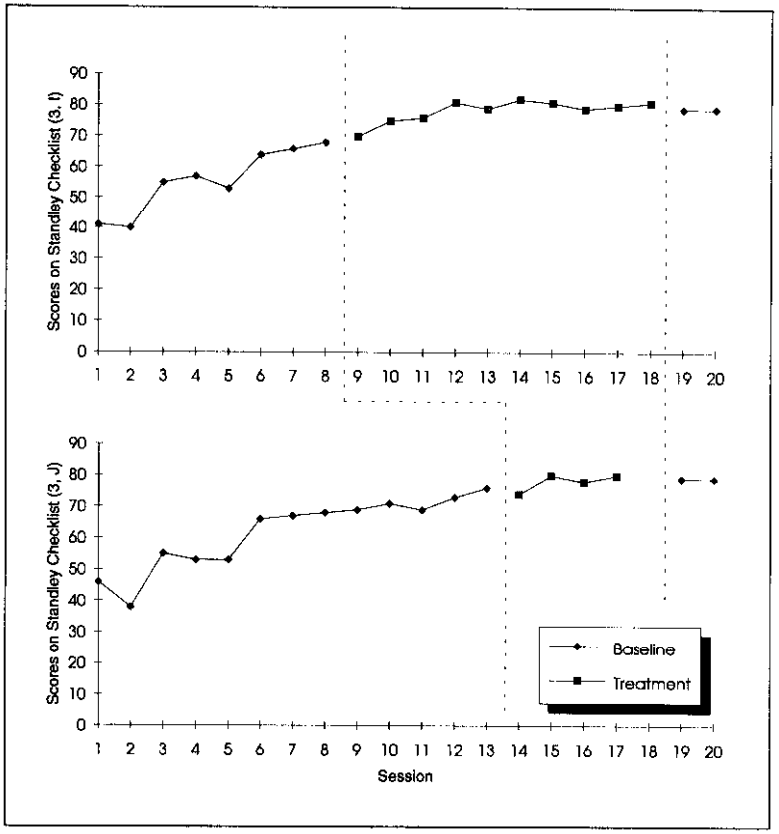

FIGURE 3.
Substudy 3.

leading skills. The scores then tended to level off after the initial increase during the baseline.

The participants' highest scores were achieved and maintained during the treatment and return to baseline procedures. The student therapists were able to develop their clinical skills with the immediate help of the supervisor, and then maintain these skills on their own when the supervisor was no longer providing them with cues, prompts, suggestions, directions, or approvals. These findings are congruent with teacher education and family therapy literature, which states that after a student

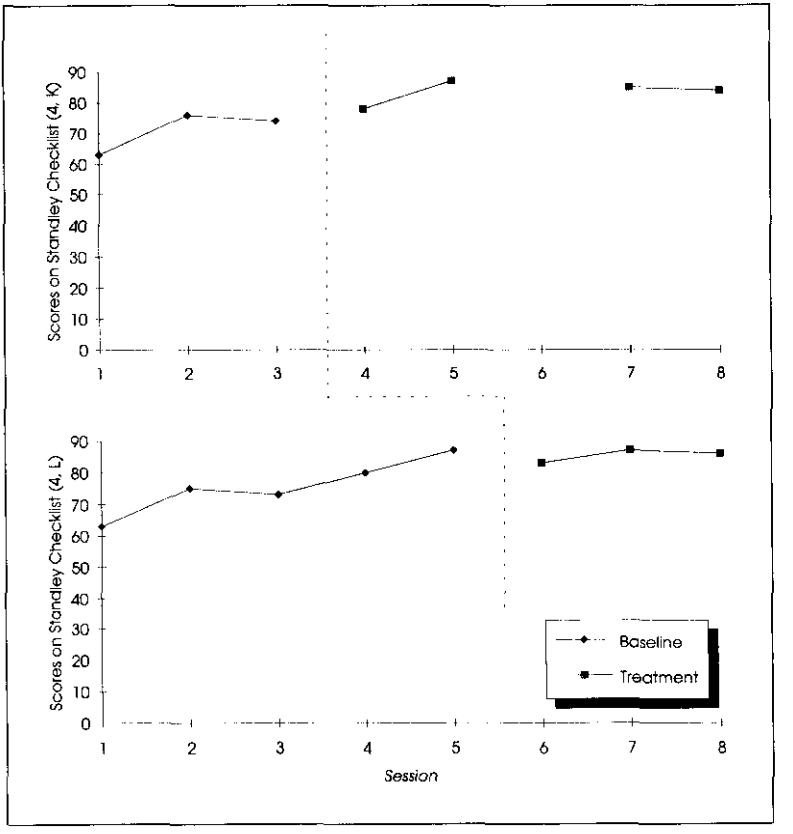

FIGURE 4.
Substudy 4.

has participated in a form of live supervision for a period of time, the live supervision can be faded out so that the student is leading the session independently. The skill level that was achieved during live supervision should be maintained by the student even after the live supervision is withdrawn (Byng-Hall, 1982; Goldenberg & Goldenberg, 1991; Tramontana, 1971; Van Houten & Sullivan, 1975).

The graphic results of the students' scores give a visual representation of the skill level achieved and maintained by the students. Eleven of the 12 students had their highest scores

during sessions in which they used the immediate feedback device and during sessions after they had used the device. Student H in Substudy 2 had about the same scores during the treatment phase as in the end of her baseline period. It must be noted that student H was the last student in that substudy to use the device. It is likely that her scores increased and maintained their level during baseline due to the fact that the other three students were receiving immediate feedback. Some of the feedback was directed to the particular students wearing the device, while at other times the student wearing the device was told to give a particular feedback statement to a student not wearing the device. Feedback such as this last category was purposely limited. Students who were experiencing baseline procedures while others were experiencing treatment procedures seemed to improve in such areas as making specific comments to clients, labeling feedback statements to clients, individualizing procedures, and body proximity to the client or group. It is likely that students not receiving immediate feedback picked up useful information vicariously by watching the interventions of the other students who were receiving the feedback.

The high scores achieved by students centered around the upper 70s and low 80s, although one student had a high score of 87. It appears that the students had reached their maximum ability level, as measured by this checklist, for their level of experience. These scores are congruent with Standley's findings (1991) that pre-internship music therapy students averaged a score of 81 points on the checklist.

The Standley Checklist has been shown to assess group leading skills of music therapists and student music therapists in the areas of personal skills, general leadership, music skills, and group responses. In this study, the students' scores on the checklist varied slightly from sessions to session with no major leaps in scores. It is possible that, while this checklist is an excellent tool for determining the overall group leading abilities of a student, it might not be sensitive enough to identify changes in day-to-day performance.

It is also possible that the effect of the intervention in this study was not necessarily on general leadership skills but on something else. Although formal data were not collected to

document these changes, it was noted during observations that the students improved in at least three areas that could have been directly influenced by the interventions: increase in specific approvals, increase in time spent with individual clients in the group, and better proximity to the client and/or group.

The students made immediate changes in the types and frequency of approvals given to the clients when cued by the supervisor. Most of the student therapists did not give specific approvals to the clients without being prompted. ("Good job playing and stopping, Susan" is an example of a specific approval that a student therapist might say after having directed the client to play an instrument and stop when given a sign to stop.) The students who were cued during live supervision to give a particular client an approval increased their approval frequency. This increase in approvals adds only one point to the checklist score for "uses appropriate cueing and feedback" in the General Leadership Skills section.

The adult clients in Substudies 1 and 2 frequently needed individual attention to successfully participate in the activities. Many times the student therapists would demonstrate the task for the client and then move on to the next client, when the first client really needed individual help with consistent directions, approvals, and sufficient time to respond. The students were frequently cued to stay with a client until he or she made an attempt at the activity or participated with the help of the student therapist. It is extremely important that the students learn to take the time to help the individuals in the group and give the client time to make some kind of response. The least responsive clients are sometimes the most difficult to work with and need the most time and assistance from the therapist. The student could earn two points on the checklist for "adapts activity for client response (+2 points)" under the General Leadership Skills section.

Proximity to the client and client group is another area in which the student therapists improved immediately upon being cued to move closer to the group, change the configuration of the group, or sit differently so as to maximize the interactions of the clients. After session feedback does nothing to help a session that failed due to a proximity problem. Immediate feed-

back allows the student therapist to correct the problem and continue on with the session with a better chance of increased client attention and participation. The checklist offers one point for "stands or sits with proximity and posture appropriate to activity and clients" under the Personal Skills section.

Future research using audio-cueing and immediate feedback during live supervision could focus on documenting one or more discreet student therapist behaviors that are important when facilitating a music therapy session. These could include number of specific approvals given, number of directions followed by specific approvals, amount of time spent with individual clients, proximity and posture appropriate to clients and activity, and amount of time spent in transitions between activities. It is possible that a functional relationship could be determined between the use of audio-cueing and immediate feedback during live supervision and an increase in one or more of the therapist behaviors listed above.

Student comments about the device were mostly positive. After an initial acclimation period most students were able to relax and listen to the feedback from the supervisor during the session. Students made several positive comments about using the BIE. Most appreciated the advice and approvals from a more experienced supervisor. The students also liked having the opportunity for immediate error correction and the positive consequences that came from an appropriate intervention. The positive reaction from the students further reinforces the value of the technique.

This equipment is easy to operate, barely noticeable to others, and requires little acclimation time for the student. Positive effects have been shown when using the BIE device on a one-time basis (Furman, Adamek, & Furman, 1992) and on a more extensive, continuous basis in this study. These factors lead to the conclusion that this device shows great promise for enhancing the training of music therapists.

Many other questions about the use of a BIE device in training settings remain. What level of student can benefit the most from using this device? What are the implications for training classroom music teachers, conductors, or classroom teachers? What kind of feedback delivered in this fashion is most useful?

What are the long-term effects of training with immediate feedback? Future researchers should seek to answer some of these questions.

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