Role of Music Therapy in Social Skills Development in Children with Moderate Intellectual Disability

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The present study investigated the effectiveness of a music therapy programme in the enhancement of the social skills of children with moderate intellectual disability. Thirty-two children (age range = 5–10 years) from four intellectual disability centres participated. At each centre, four children were randomly selected to participate in the music therapy programme, while four children were assigned to a non-music control group programme. One staff member was trained in each group procedure at each centre, and requested to run 30-min group sessions twice weekly over an 8-week intervention period. Five social skills were targeted for intervention: turn-taking, imitation, vocalization, initiation and eye contact. Measures of effectiveness involved comparison of pre- and post-intervention scores on five target skills using a brief social skills test specifically designed for the study. Evaluation forms completed by teachers also provided feedback on the effectiveness of the intervention. The results reflect significant improvements in the five target social skills across both conditions following the 8-week intervention. However, this difference was found to be independent of the music/non-music intervention.

Introduction

Music therapy

Music has been used extensively throughout history as a healing force to alleviate stress and illness (Feder & Feder 1981). Music therapy involves ‘the use of organized sounds and music within an evolving relationship between client and therapist to support and encourage physical, mental, social and emotional well-being’ (Bruscia 1987). However, what is not clear in this therapeutic process is the relative contribution of music on the one hand and the therapeutic relationship on the other.

In the UK, both factors (i.e. the music and the music therapist) have been considered central and inseparable as facilitators of change. However, music therapy is practised in other countries by musical psychologists and educators, often as an adjunct to another therapeutic modality such as psychotherapy. Bruscia (1987) differentiated this adjunct approach as ‘music in therapy’ as opposed to music being used specifically ‘as therapy’.
Music therapists primarily try to make contact and establish a relationship with another person through music. They observe the client’s use of music, and how problems or difficulties may get in the way of interactive communication (Heal & Wigram 1993). In the field of intellectual disability, music therapy has been used as a tool to maintain and develop such areas as physical skills (Bolton & Adams 1983; Oldfield & Adams 1990), social skills (Saperston 1973; Nordoff & Robbins 1976; Bunt 1978; Mundy et al. 1986; Humpal 1991) and improving the communication of children with autism (Thaut 1987). However, little has been reported concerning the efficacy of music therapy with different levels of intellectual disability.

In adult mental health, music therapy has been used: in psychiatric settings (Schmuttermayer 1983; Pfeiffer et al. 1987; Pavlicevic & Trevathen 1989); with the elderly (Dellman-Jenkins & Papalia 1984; Swartz et al. 1989; Tyson 1989); in hospice care (Bailey 1983; Aldridge 1988; Zimmerman 1989); in coronary care (Bolwerk 1990; Davis-Rollans & Cunningham 1987); and in the area of neurology (Sparks & Deck 1986; Gustorff & Aldridge 1990).

Music therapy has also been used specifically with children: exploiting the calming effects of music (Marley 1984); to facilitate speech and language development (Sutton 1991); and as a preoperative aid for hospitalized children (Grimm & Pefley 1990). Although it would appear that there is a broad literature covering the application of music therapy in clinical practice, there is a general absence of valid, empirical research from which substantial conclusions may be drawn (Aldridge 1993).

Rationale

Music therapy has been reported to be beneficial in the development of social skills of children with intellectual disability (Bunt 1978; Humpal 1991). However, what is unclear is the specific role played by music in this process. The aim of the present study was not only to investigate further the effectiveness of music therapy in facilitating social skill development, but also to evaluate the specific contribution provided by the music component.

Method

Intervention programmes

Two equivalent intervention programmes were designed, a music therapy social skills group programme (MP), based on elements of a programme published by Humpal (1991), and a non-music social skills control group programme (NMP). Control group programme participants were matched on age and intellectual ability. Both programmes were implemented by staff at four special schools for children with learning disabilities. The staff had either teaching or childcare backgrounds. Both programmes were designed to develop five target social skills which were regarded as primary: initiation, turn-taking, vocalization, imitation and eye contact (Saperston 1973; Bunt & Alberman 1981; Humpal 1991; Muller & Warwick 1993).

For the music group programme, a cassette tape of pre-recorded music of 30 min in duration was compiled, comprising a selection of classical music and original songs. A therapeutic manual accompanied the cassette tape, and provided detailed and explicit
instructions regarding procedures to be followed during each section of the programme.

The non-music programme was identical to the music programme except that particular non-musical activities were substituted for musical elements (see Table 1). The programme session was also $\approx 30$ min in duration and a therapy manual was provided to accompany the NMP.

Activities in both the MP and the NMP were designed to promote the development of selected social skills in a peer group setting by providing opportunities for learning through repetition and rehearsal. Standard materials were provided for use in both group programmes across all four settings (see Table 1).

Participants

Thirty-two children aged between 5 and 10 years who functioned in the moderate range of intellectual disability were selected from special schools attached to four intellectual disability day centres. These centres provide day programmes for children and adults with mild to profound intellectual disability. Each child was assigned to either an MP or a NMP group of four children in each centre. Levels of functioning were determined from school records based on psychologists’ reports.

Procedure

One staff member was trained in each group procedure at each centre, although a second staff member attended at two of the centres. Training was by demonstration, which allowed opportunity to talk through activities and explain instructions outlined in the manual guides. Staff were not informed of the aims or objectives of the study at this time.

Following the demonstration and rehearsal of group programmes, staff were requested to implement the group procedures twice weekly over an 8-week period. Progress during intervention was monitored by regular phone calls to the schools. At the end of the intervention, staff were asked to complete an evaluation form and were presented with certificates of completion.

Measures

Social skills test

A brief social skills test was designed to measure the presence and quality of all five target social skills in each child. The test was devised for administration prior to and following intervention. The test provided opportunities for children to display each of the five target social skills through a series of tabletop activities, with the researcher acting as assessor. The quality of social skills was assessed using a five-point Likert scale based on one devised by Pfeiffer et al. (1987): (1) skill very poor; and (5) skill well-developed. Each skill is operationally defined in ‘Appendix I’.

The test was $\approx 5$ min in duration and all pre-post test performances were videotaped for evaluation purposes. Pilot testing and clinical experience confirmed that this sampling frame was large enough to identify the presence of the various social skill elements. All video footage was viewed by the researcher and an independent observer,
Table 1 Content and materials of the music and non-music programmes

<table>
<thead>
<tr>
<th>Music group</th>
<th>Non-music group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Content</strong></td>
<td><strong>Materials (n)</strong></td>
</tr>
<tr>
<td>Signature tune</td>
<td>Drum (1)</td>
</tr>
<tr>
<td>Opening song</td>
<td>Keyboard (1)</td>
</tr>
<tr>
<td>Instrumental</td>
<td>Shakers (4)</td>
</tr>
<tr>
<td>Relaxation to music</td>
<td>Tambourine (1)</td>
</tr>
<tr>
<td>Action song</td>
<td>Cymbals (2)</td>
</tr>
<tr>
<td>Thank you song</td>
<td>Hand bells (2)</td>
</tr>
<tr>
<td>Signature tune</td>
<td>Scented hand lotion</td>
</tr>
</tbody>
</table>

and rated independently. The researcher also completed a brief quantitative evaluation, counting the occurrences of two target skills (i.e. initiations and vocalizations) in each child's performance.

**Evaluation questionnaire**

Following the intervention period, staff were required to complete an evaluation questionnaire, based on their experience of facilitating the group. The form used was a modification of a similar questionnaire devised by Humpal (1991), using relevant items relating to social interaction and programme design; the Humpal (1991) study included a comparison between intellectually disabled and 'mainstream' peers.

**Design**

A $2 \times 2$ repeated measures analysis of variance (ANOVA) statistical design was adopted for the present study with condition (MP versus NMP) and sample (pre versus post) as main factors and repeated measures on the second factor. The dependent variables were the five target social skills: imitation, turn-taking, initiation, vocalization and eye contact.

**Results**

Out of the 32 children selected for inclusion in the present study, one was dropped from the NMP sample after five sessions because of behavioural difficulties, and although another child was substituted for balance in the activities, this child was not included in the analysis because of a lack of pre-screening evaluation. Also, it was not possible to carry out all 16 sessions of the intervention at all centres because of child absences as a result of illness. The following analyses were carried out on data obtained from the remaining 31 children. The data were analysed using the Statview statistical package for Apple Macintosh computer.

**Pre-post video analyses of social skills test (qualitative form)**

All pre-post social skills video measures were viewed by the researcher and an independent observer. In order to determine inter-rater reliability, a Spearman's Rho was carried out (Siegel 1956; pp. 202–213), using five-point Likert scale ratings [from (1) 'very poor' to (5) 'well-developed'] under each of the five target skills. A very high correlation ($r_s = 0.99$) was found on all measures. Thus, it was accepted that coding was reliable.

For further analysis of the rating scales, the scores of the principal observer were compiled, resulting in each child obtaining both pre- and post-test scores for each of the five skill areas. A total socialization score (maximum = 25) was also computed for each child by adding individual skill scores.

**Between-group comparisons**

A two-way ANOVA repeated measures was performed on all pre-post test scores for each social skill variable (see Table 2) in order to explore treatment effects and interactions. Overall, the ANOVA results revealed a very large main effect for samples com-
mon to all social skill variables, with mean post-test scores being higher than pre-test results.

There was only one main effect for conditions (for turn-taking) and only one significant interaction (for imitation) (see Table 3). Thus, the sample effect was generally independent of conditions, not supporting the hypothesis that a music therapy intervention would prove more beneficial in the enhancement of social skills.

For the significant interaction on the imitation variable, a critical means test revealed that both groups showed significant improvements on imitation skills over the intervention period, with a larger difference observed within the music group condition.

Within-group comparisons

Paired t-tests (one-tailed) were carried out separately for the MP and NMP groups to investigate pre-post differences in all skill areas. In both conditions, significant increases in ratings on all five skill dimensions were found (see Table 4).

Age and gender differences

No correlation was found between age of participant and pre-post test differences (n = 31) on any of the five skill areas (see Table 5), although a correlation with total socialization score of $r = 0.34$ ($P < 0.06$, d.f. = 29) was observed.

With regard to gender differences, independent t-tests with pooled data from both the MP and NMP conditions did not reveal any significant differences in progress on specific target skill areas. The results of these analyses revealed that age and gender were not related to the development of social skills in the present study.

Pre-post video analyses of social skill test (quantitative form)

Quantitative scores were derived from frequency counts of initiation and vocalization behaviours (e.g. actions which initiated either interaction with an object or with the researcher, such as if child attempted to begin a game, turn a page in the book, initiate conversation or ask a question).

Significant increases were found for both variables in the MP and NMP groups from pre- to post-test. For the MP group, the pre-post mean difference for initiation was 8.0 ($t = 5.17$, d.f. = 15, $P < 0.0001$), and for vocalization, this was 10.8 ($t = 2.79$, d.f. = 15, $P$
<table>
<thead>
<tr>
<th>Measure</th>
<th>Pre-post difference</th>
<th>Interaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F-value</td>
<td>P-value</td>
</tr>
<tr>
<td></td>
<td>Mean square</td>
<td></td>
</tr>
<tr>
<td>Social skill</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turn-taking</td>
<td>4.65</td>
<td>&lt; 0.04</td>
</tr>
<tr>
<td></td>
<td>29.80</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Imitation</td>
<td>6.17</td>
<td>&lt; 0.13</td>
</tr>
<tr>
<td>Teacat</td>
<td>3.80</td>
<td>&lt; 0.29</td>
</tr>
<tr>
<td>Vocal</td>
<td>1.2</td>
<td>&lt; 0.19</td>
</tr>
<tr>
<td>Eye</td>
<td>0.83</td>
<td>&lt; 0.73</td>
</tr>
<tr>
<td>Intuition</td>
<td>0.10</td>
<td>&lt; 0.08</td>
</tr>
<tr>
<td>Total</td>
<td>59.4</td>
<td>&lt; 0.08</td>
</tr>
</tbody>
</table>
Table 4: Results of paired t-tests: mean difference scores by group for each social skill

<table>
<thead>
<tr>
<th>Measure</th>
<th>Mean difference</th>
<th>t-test</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Music group*</td>
<td>1.69</td>
<td>5.65</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Turn-taking</td>
<td>2.31</td>
<td>9.77</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Imitation</td>
<td>1.44</td>
<td>4.12</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Vocalization</td>
<td>1.44</td>
<td>5.97</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Eye contact</td>
<td>1.44</td>
<td>6.45</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Initiation</td>
<td>8.38</td>
<td>11.57</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Total score</td>
<td>1.07</td>
<td>5.17</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Non-music group†</td>
<td>1.53</td>
<td>4.77</td>
<td>&lt; 0.0003</td>
</tr>
<tr>
<td>Turn-taking</td>
<td>1.33</td>
<td>4.93</td>
<td>&lt; 0.0002</td>
</tr>
<tr>
<td>Imitation</td>
<td>1.47</td>
<td>8.88</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Vocalization</td>
<td>1.20</td>
<td>4.58</td>
<td>&lt; 0.0004</td>
</tr>
<tr>
<td>Eye contact</td>
<td>6.60</td>
<td>9.05</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>

*d.f. = 15; †d.f. = 14.

< 0.014). For the NMP group, the pre-post mean difference for initiation was 7.3 (t = 3.25, d.f. = 14, P < 0.006), and for vocalization, this was 18.7 (t = 2.01, d.f. = 14, P < 0.064). However, there were no significant differences between the MP and NMP groups (initiation: t = 0.21, P = 0.84; vocalization: t = 0.79, P = 0.44).

Evaluation forms

All participating staff at centres were requested to complete an evaluation form following the 8-week intervention period. All four staff who were involved in the music intervention and three of those involved in the non-music intervention returned completed forms. The following sections highlight general feedback on both group programmes.

Questions 1–3 of the evaluation form required teachers to comment on the size of the group, length of sessions and number of sessions using a three-point scale. A Fisher test comparing frequencies of ‘adequate’ versus ‘other’ (Siegel 1956) revealed no significant differences in responses between groups. Group size was ‘adequate’ for the MP group and teachers were equally divided between ‘adequate’ and ‘too small’ for the

Table 5: Correlations: age/pre-post differences

<table>
<thead>
<tr>
<th>Measure</th>
<th>Correlation</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age/turn-taking</td>
<td>0.25</td>
<td>&lt; 0.17</td>
</tr>
<tr>
<td>Age/imitation</td>
<td>0.30</td>
<td>&lt; 0.10</td>
</tr>
<tr>
<td>Age/vocalization</td>
<td>0.25</td>
<td>&lt; 0.18</td>
</tr>
<tr>
<td>Age/eye contact</td>
<td>0.04</td>
<td>&lt; 0.85</td>
</tr>
<tr>
<td>Age/initiation</td>
<td>0.01</td>
<td>&lt; 0.96</td>
</tr>
<tr>
<td>Age/total score</td>
<td>0.34</td>
<td>&lt; 0.06</td>
</tr>
</tbody>
</table>

NMP group. For session length, a majority selected ‘adequate’ for both groups, and for number of sessions, although the NMP teachers generally regarded this to be adequate, a majority of MP teachers considered it to be too many.

Question 4 investigated the effectiveness of particular activities in the facilitation of interaction. Respondents were requested to rate activities on a three-point scale from (1) ‘not effective’ to (3) ‘very effective’. In the music condition, singing, playing instruments, massage and dance were rated as effective. In the non-music condition, verse, free play and action were rated as effective, and massage as very effective in the facilitation of interaction.

Question 5 aimed to establish any benefits of each group programme in nine areas related to social skills. Respondents were requested to rate the benefits of the programme using a three-point scale from (1) ‘not beneficial’ to (3) ‘very beneficial’ (see Figure 1).

Both programmes appear to be particularly beneficial in developing imitation skills, increasing anticipation and providing enjoyment (although the possibility cannot be ruled out that these changes might have occurred with no intervention, of course). Interestingly, teachers involved in the implementation of the non-music control programme provided slightly higher rating scores on all skill areas. The remainder of the group evaluation form allowed for more descriptive and qualitative answers and comments which are summarized below for each condition.

**Music group**

Teachers involved in the implementation of the music group intervention described the music programme as ‘very enjoyable, the easiest part of the day, as everyone was seated’. Respondents stated that elements of the programme were ‘excellent in terms of

turn-taking and choice-making", with children beginning to anticipate and remember
turns, as well as developing preferences for particular instruments as sessions pro-
gressed.

Other comments suggested that the signature tune and the music in the instrumental
section proved too long once children had become familiar with the programme,
requiring much energy to keep the enthusiasm of the children going during these sec-
tions. Many teachers also highlighted their uncertainty regarding the level of input
required of them and whether or not it was appropriate to prompt actions as facilita-
tors of this programme. Suggestions for improvements to the programme included
shortening some sections of the programme, modifying the programme to include the
full class compliment and development of the programme as a series from elementary
to advanced levels.

Non-music group

Teachers commenting on the non-music social skills intervention package reflected
very positive attitudes towards the programme; for example, 'I was always reminded
by the children to “do group”!' Respondents described 'a lot of chat in the free play
section', and staff indicated that children began 'to play appropriately with toys and
share'.

All respondents stated that children loved the ball games and that activities were
very effective in improving target skills. Comments also indicated the calming effects
of the massage section for both teachers and children, and although some children
were reported to be fearful of massage at first, teachers indicated that most became
more comfortable as sessions progressed.

Overall, the comments indicated that the programme was 'an excellent idea, with
short planned activities, no time for children to get bored'. Recommendations for
future groups again suggested the incorporation of an advancement of levels within
the programme and an increase in group size to include all of the class. Suggestions
were also made to adapt the programme for use in other areas of the curriculum (e.g.,
counting and colours).

Discussion

The present study aimed to test the role of music per se in a music therapy intervention
with children with moderate intellectual disability. The results of both qualitative and
quantitative evaluations of pre-post social skills scores clearly indicate that significant
improvements on target social skills were apparent across both the music and non-
music conditions. However, exploration of differences between music and non-music
group interventions did not generally reveal significant differences. Only on one skill
area (i.e. imitation) did the music condition appear to show a tendency towards being
more effective. In this condition, repeated actions for imitation involved rhythmic shak-
ing of musical instruments (e.g. shakers and hand bells) to music. It may be suggested
that the synchronization of acts to musical rhythm helped both stimulation and coordi-
nation, enabling greater skill development than in the non-music condition. From a
skills-learning perspective, the sounds produced in the rhythmic repetition provide
both corrective and motivational feedback as to the timing and accuracy of the
response.
Factors including the age and gender of the participating children were not found to be related to the development of social skills across either intervention investigated in the present study.

Music therapy as delivered in this programme did not appear to be a more effective intervention when compared with a non-music control package. Thus, the present study throws open the question of whether music itself needs to be included. Perhaps music therapy interventions in essence merely provide an alternative channel of intervention in the area of social skills training, rather than a necessarily more beneficial one. However, on the other hand, the utilization of music by trained music therapists, who are highly musically skilled and aware of the developing therapeutic relationship, and who predominantly use an improvisational approach rather than pre-recorded music, may elicit more positive results.

The results of this evaluation also reflect that it may not merely be the complexity of music itself which accounts for progress or maintains interest over time, but the building of a therapeutic relationship between client and therapist. The general feedback on effectiveness of both music and non-music interventions used in the present study was very positive, and pre- and post-test scores indicated the effectiveness of both group programmes in the enhancement of social skills.

Because the present study did not incorporate a ‘no treatment’ group condition, it is difficult to ascertain whether social skills within both group conditions were developing naturally or were directly attributable to the music and non-music interventions. However, as noted earlier, differences in age did not appear to be a factor in the acquisition of social skills within this client group, which supports the argument regarding the effectiveness of both group interventions.

Nevertheless, the selection of four children from a large class of children for participation in this group may have been an extraneous variable in that the mere process of being ‘picked out’ for special treatment and attention may have provided for an increase in self-esteem, which may have masked the actual changes resulting from the intervention. In addition, the increase in individual attention and staff time may in itself have contributed to a ‘Hawthorne-type effect’ (see Oborne 1995; pp. 393-394).

As with other methods of group therapy, not all students are motivated and reinforced by the same techniques and incentives. A graded approach, as suggested by the teachers, might have allowed for individual differences, permitting different children to proceed at different levels of the programme (Boyd 1989).

Music provides means for social interaction, one most individuals find rewarding and one which is embedded in our culture, making it easily accessible. However, while the results of the present study do not undermine the potential value of music therapy as an intervention in the field of intellectual disability, the findings nevertheless demonstrate the need for therapists to focus on evidence-based practice and the parallel need for school curricular interventions to be based on good data. The present results indicate that the music component of the therapy per se does not appear to be the important element in the intervention process.

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Bunt L. (1978) The Hammersmith Project. A report of a project funded by the National Medical Research Fund, Department of Paediatrics, Charing Cross Hospital Medical School, London.


Tyson J. (1989) Meeting the needs of dementia. Nursing Elderly 1 (5).


Appendix 1

Operational definitions of the skills constituting the social skills test

(1) Initiation: Any attempt to initiate an action with an object, or any attempt to interact with the researcher, either verbally or behaviourally.

(2) Imitation: The ability to respond to and copy repeated actions of the researcher (e.g. using the Basic OXO Magnet Board).

(3) Turn-taking: The ability to wait for a turn, take a turn and pass on a turn to the researcher (e.g. using the Jumping Frog game).

(4) Eye contact: The presence of appropriate eye contact with the researcher.

(5) Vocalization: Any attempt to vocalize while interacting with the researcher or while engaging in a task (e.g. reading a picture book).