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THE EFFECT OF MUSIC THERAPY
ON MOTOR CONTROL OF
CEREBRAL PALSIED CHILDREN

A thesis presented in partial fulfilment
of the requirements of the degree of
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ABSTRACT

In this study, the use of music therapy with cerebral palsied children aimed to establish consistent motor control and extend rehearsal of functional motor actions. Music therapy processes explored the effect of auditory rhythm and pentatonic melody on the quantity and regularity of arm-hand motor action of children with cerebral palsy. Eight children, aged five to eleven years, were involved, each child being considered as a single subject case study. The design of the study was an interrupted time series design (ABACA). A constant beat sound stimulus, emitted by a music-based computer, was determined from the personal tempo of each child and formed a beat-only condition in A sections. That beat sound was joined by child-activated pitched sounds in B and C, together with a third compatible music stimulus in section C, which was singing by the therapist. Pitched sounds and singing were restricted to the five notes of a selected pentatonic scale. Each child was asked to 'play with the beat', making arm-hand contact on a specially constructed keyboard. Measurements were recorded instantly by the computer, which registered number of contacts made, average note duration, note changes made, and three measurements relating to regularity of contacts made.

Results showed that all children attended to the music-based task of playing with the beat. Melody plus rhythm stimuli gave more motor contact actions than rhythm stimulus alone, for all children. Measurements of regularity of motor control, (deviation from beat, average tempo and pulse-tempo deviation), were affected in varying ways by melody plus rhythm. Some neuromuscular delay could be inferred, although anticipation of beat sound and muscle action inherent in a rhythm task was present. This suggests that cerebral palsied children respond to a music-based task with extension of effort and some control of muscle tone.

Results from pre and post tests done using selected items from the Bruininks-Oseretsky Test of Motor Proficiency did not give results that could be regarded as significant. A longer experimental period than three weeks is suggested for similar studies.

Computer measurement of time-based motor behaviour resulting from music stimuli was objective and accurate. Similar type music therapy studies could find this use of a music-based computer for measurement most useful.

Overall the aim of the study was to look at the effect of music therapy on motor control of cerebral palsied children. Regular rhythm was used to provide structure for the required time-ordered behaviour, and the pace of beat stimulus given was personal to each child. In 'playing with the beat' the child attempted to synchronise arm-hand action with the beat-based signal; this process required cognitive anticipation of a sensorimotor action. The ability to make regular contact was relative to degree of neuromuscular dysfunction, age and maturation and affective interest in the task. The independent variables of music therapy, with rhythm and melody, were employed in a planned, sequential order so that the dependent variable, motor control, could be measured relative to the whole task and to rhythmic and melodic components in the task.

The planned processes of a simple music therapy task, using rhythm and melody stimuli, supported extension of rehearsal of a motor task and improvement of motor control.

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