

The Effects of the Movement of the Body on Music Performance

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Abstract: Multi-modal functions have attracted interest. We have the sixth sensation, proprioception that gathers information from within our body. The addition of proprioception would help us to enjoy and learn music profoundly. The aim of this research is to examine the hypothesis that when we sing a song together with the movement of the body related to the song, we could enjoy and learn the song more than without the movement. Participants in the experiment were divided into two groups; the members of the one group memorized the unknown song by listening to it without any bodily movement, while the members of the other group memorized the same unknown song by watching and imitating the movements related to the lyrics and the rhythm of the song. They performed the song from their memory, and were asked to write down their feelings. I compared the performance and the descriptions of listening participants with that of watching & moving participants. As the result, watching & moving participants memorized the song more than listening participants with highly statistically significance, and watching & moving participants felt more interesting and less difficult in memorizing the song than listening participants with statistically significance. The findings of this research should contribute to body involvement in music education.

Key words: multi-modal function, proprioception, the bodily movement, children's song, music education

1. Background

Multi-modal functions have attracted interest. The interest has focused on researches into interaction between auditory and visual sensations. The researches in the coordinative interaction between auditory and visual sensation have revealed that melody and rhythm attached to pictures of a film increase our enjoyment, while the pictures of a film help us to understand music (Iwamiya, 2004). We have the sixth sensation, however, proprioception that gathers the information from within our body, telling us about our physical position and movement. The addition of proprioception would help us to enjoy and understand music profoundly.

In the field of early childhood education, it is generally accepted that singing with moving their fingers and body is a more effective educational method for young children, known as the theory of Fröebel. The theory of Fröebel has been introduced into primary education in Japan, especially into kindergartens since 1890's. It has the advantage of the importance of the play or the activities in the education for young children. The Songs and Music of Friedrich Froebel's Mother Play (1843) was adopted to the education for Japanese children after modified to suit them. In 1910's Japanese composed children's songs in the style of western music, and popular choreographers allotted the bodily movement to the songs, as leading educators encouraged young children in singing the songs moving their body. A lot of children's songs were sung accompanied with the bodily movement

in primary education in Japan before WW II. By the way, some researchers cite the influence from the Japanese traditional dance which has been choreographed to exactly fit the lyrics of the song as the reason for the popular children's song with bodily movements in those days. To sing the songs moving the body now is less than in those days, but the importance of bodily movement is being realized again in primary music education.

2. Aims

The aim of this research is to examine the hypothesis that when we sing a song together with the movement of the body related to the song, we could enjoy and learn the song more than without the movement.

3. Method

3.1 Participants

51 participants who will be teachers in early childhood education were put into four groups: new students at a college, seniors at the college, students in a special course at the college equivalent to the third grade in university, and the second grade students at a university (ranging from 19 to 21 in age).

3.2 Materials

A children's lively marching song "we sound our shoes" (see Figure 1) was composed nearly a century ago and allotted bodily movements a little later was used in the experiments. There are two reasons for this selection. Firstly, the song is supposed to be unknown to the participants. Although it had been very popular, nowadays it is neither sung in kindergartens nor taught in teacher training courses. Secondly, I knew the bodily movements exactly fit the lyrics of the song taught in a teacher training course in 1933. The musical phrase composed of respective two bars corresponds to a passage of lyrics as well as a series of bodily movements. For example we sing "we walk hand in hand" with walking hand in hand at the first two bars of the song, we sing "being like a pretty little bird" with moving hands up and down like a bird at the forth two bars, and we sing "we sound our shoes" with poking a finger at our toe at the last two bars.

We sound our shoes



Figure 1 We Sound Our Shoes

The lyrics of the song are as follows;

The first verse of the song:

We walk hand in hand along the lane. Being like a pretty little bird, we sing a song, and we sound our shoes.
Beneath a clear blue sky, we sound our shoes.

The second verse of the song:

We pick flowers and put them in our hair. Being like a pretty rabbit, we jump and dance, and we sound our shoes. Beneath a clear blue sky, we sound our shoes.

The bodily movements allotted to the song were written down in a notebook of a student on a kindergarten's teacher training course in 1933. They are as follows:



Figure 2 Bodily Movements of the Song

In explanation of the pictures:

The first line of the picture (corresponding the first verse of the song);

We walk hand in hand, clap our hands six times, and imitate little birds with hands up and down making one rotation. Hands make the shape of a circle on the mouth like singing, and we poke a finger at the toe three times. Hands make a big circle over the head, and we poke a finger at the toe three times.

The second line of the picture (corresponding the second verse of the song);

We pretend to pick flowers and to put them to our hair, clap hands six times, and imitate rabbits with hands on our head. We jump and make one rotation, and poke a finger at the toe three times. Hands make a big circle over the head, and we poke a finger at the toe three times.

I recorded the song sung by myself on a CD, and the song together with the above movements by the different students on a DVD.

3.3 Procedure

The participants of the four groups took part in the experiments separately. The participants of each group were divided into another two groups; the members of the one group memorized the unknown children's song by listening to it three times without any bodily movement [listening participant (student)], while the members of the other group memorized the same unknown song by watching and imitating the movements related to the lyrics and the rhythm of the song three times [watching & moving participant (student)]. They then were asked to sing the song from memory and to answer the following questions:

- (Q1) Have you listened to the song? • Yes • No
- (Q2) How do you feel about memorizing and singing the song? • much interesting
• interesting • can't say anything definite • not interesting • difficult
- (Q3) Only to those who chose "much interesting" or "interesting" in (Q2), what do you feel much interest or interest in?
- (Q4) What's the song like?
- (Q5) What makes the performance so difficult?

3.4 Results

3.4.1 Comparing the performance of listening participants with that of watching& moving participants in each group, I drew a following graph (see Figure 3).

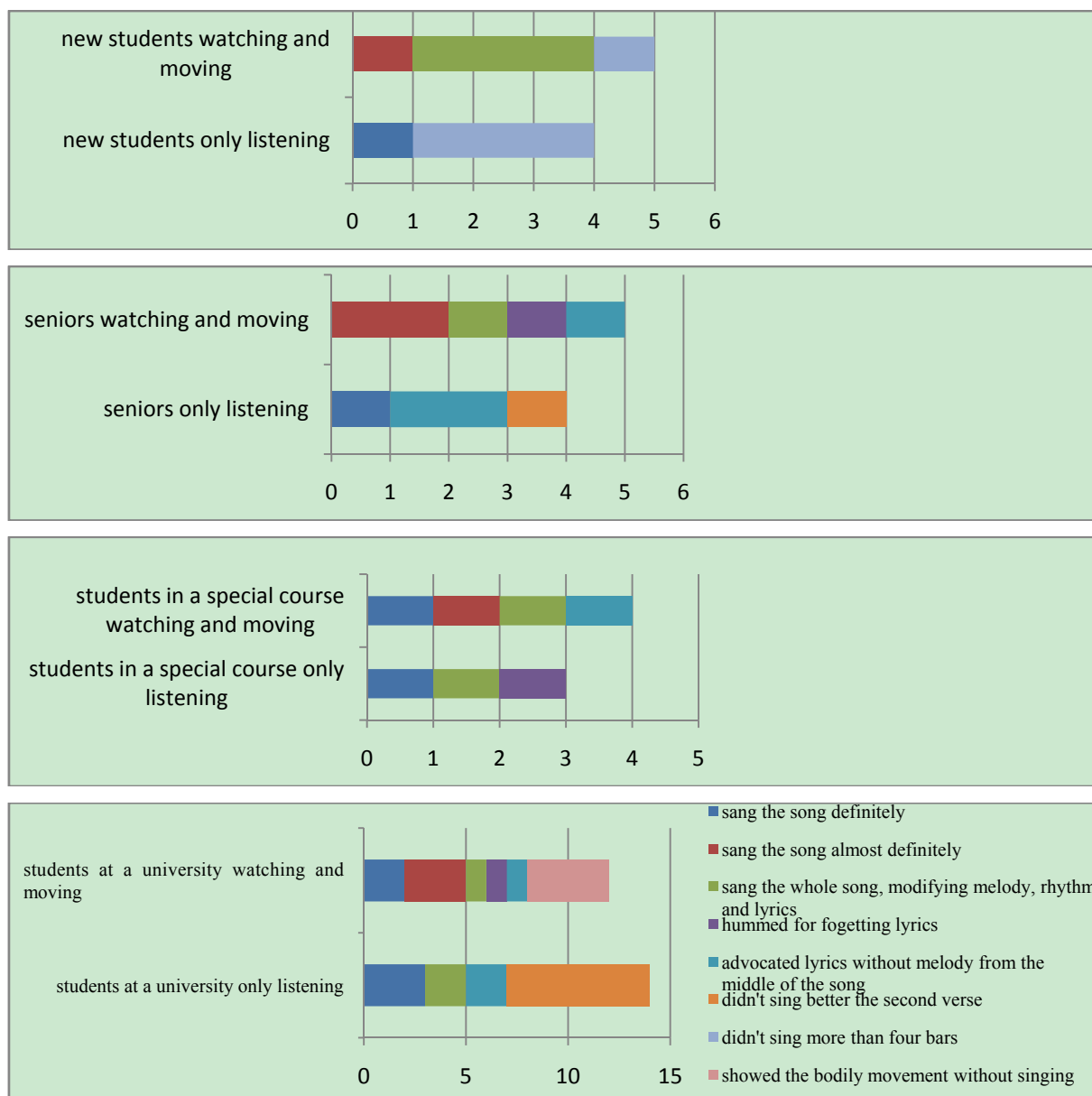


Figure 3 The Performance of Participants in Each Group

(1) In the group of new students (4 listening students, and 5 watching & moving students), the best memorist was among the listening students, who has learned it in her childhood. Other 3 listening students didn't sing more than four bars. While one of the 5 watching & moving students sang the song almost definitely, 3 another students sang the whole song led by bodily movements in spite of modifying melody, rhythm and lyrics, and the other couldn't recall all the song nor all bodily movements. For the new students who haven't had much musical experience, the bodily movements allotted to the song certainly helped them to memorize it.

(2) In the group of seniors (4 listening seniors, and 5 watching & moving seniors), the best memorist was a listening senior, who has so much musical talent that she often represents piano music by ear without the music sheet. Another 2 seniors advocated lyrics without melody after the middle of the song. The other remembered parts of melody and of lyrics separately. While 2 of the 5 watching & moving seniors sang the song almost definitely, and the 3rd out of the 5 remembered the outline of the lyrics catching her cue from melody, and the 4th hummed for forgetting lyrics to sing the whole song. The other advocated the outline of the lyrics with a few movements. Moving the body must be effective for the seniors, too.

(3) In the group of students in the special course (3 listening students, and 4 watching & moving students), the best memorists were both a listening student and a watching & moving one. The former sang the song not only correctly but also excellently. The latter sang the right song with the right bodily movements. The 2nd out of listening students sang the whole song with the bodily movements devised by herself in spite of a few stops, and the 3rd advocated the lyrics without singing after the middle of the song. As to the remaining 3 watching & moving students, one sang the song almost definitely, the 2nd out of them sang the whole song with perfect bodily movements modifying melody sometimes, and the other advocated the lyrics falteringly without singing after the middle of the song. Regardless of the way of memory, the students in the special course most concentrated on memorizing the song so that they could gain good results.

(4) In the group of students at the university, there were 14 listening students, and 12 watching & moving ones. As to the listening students, although 3 sang the song definitely, 2 of them have known the song. 2 sang the whole song modifying melody and rhythm. 2 advocated most lyrics with the right rhythm and the wrong melody. 7 didn't sing the second verse even if they sang the impressive "we sound our shoes" or advocated its lyrics in the last phrase of the song. As to 12 watching & moving students, 2 sang the song definitely, 3 sang almost definitely, one sang the whole song stopping sometimes, the another hummed for forgetting lyrics, and the other advocated lyrics after the third bar of the first and the second verse of the song. The other 4 showed all the bodily movements without singing the song totally. It is highly significant that two third of the watching & moving students sang the whole song led by the bodily movements.

3.4.2 The relation between the way of memory and performance of participants was analyzed statistically.

The performance of participants was divided into two larger groups again; one is (A) including "sang the song almost definitely", "sang the whole song modifying melody, rhythm and lyrics", and "hummed for forgetting lyrics", the other is (B) including "advocated lyrics without melody from the middle of the song", "didn't sing better the second verse", "didn't sing more than four bars", and "showed the bodily movements without singing". Data on 22 listening participants after I eliminated 3 who have known the song and on 26 watching & moving participants were analyzed using Chi-square for independence test (Table 1).

Table 1 The Relation between the Way of Memory and the Performance

	good (A)	not good (B)
Listening	7	15
Watching & moving	18	8

χ^2 for independence test

Frequency of observation				Frequency of expectation		
	good (A)	not good(B)	total		good	not good
Listening	7	15	22	Listening	11.45833333	10.54166667
Watching & moving	18	8	26	Watching & moving	13.54166667	12.45833333
Total	25	23	48			

results

Degree of freedom	1
χ^2 value	6.683514746
P value(upper side test)	0.009730857
Contingency table coefficient	0.349602271
ϕ Coefficient	0.373148617
Fisher's exact probability P value	0.010404027
Odds ratio	0.207407407
χ^2 (0.99)	6.634896601

χ^2 value: 6.683515 > χ^2 (0.99): 6.634897, p value: 0.009731 < 0.01

Differences in the performance between the ways of memory were highly statistically significant. Therefore, watching & moving participants recalled the song more than listening participants.

3.4.3 The description in the questionnaire was analyzed statistically.

To Q2 about the feeling of participants, they chose one among five answers; much interesting, interesting, didn't say anything definitely, not interesting, and difficult. These answers were allotted 1, 2, 3, 4, and 5 respectively. Data were analyzed using Mann-Whitney's U test (see Table 2).

Table 2 The Relation between the Way of Memory and the Feeling

much interesting: 1, interesting: 2, didn't say anything definite: 3, not interesting: 4, difficult: 5					
	1	2	3	4	5
Listening	1	9	3	0	12
Watching & moving	5	13	3	0	5
Mann-Whitney's U test					
	number of data	rank sum	mean rank		
Listening	25	771.5	30.86		
Watching & moving	26	554.5	21.32692		
results					
U value		446.5			
U' value		203.5			
Z value		2.289331			
P value(two side test)		0.02206			
concurrently revised Z value		2.440749			
concurrently revised P value (two side test)		0.014657			
number of concurrence		5			
Z (0.975)		1.959964			

concurrently revised Z value: 2.440749 > Z (0.975): 1.959964; concurrently revised P value: 0.014657 < 0.05

Differences in the feeling between the ways of memory were statistically significant. Therefore, watching & moving participants felt more interesting and less difficult than listening participants.

3.4.4 The data on the answers to Q3 (What do you feel much interest or interest in?) written by the participants who answered very interesting or interesting in Q2 are as follows. The round brackets give the number of the answer.

The listening participants wrote:

To know a new song (2)/ To try to remember the song(1)/ To remember my childhood days(1)/ To keep memory in order to sing the whole song (2)/ It was heart-stopping experience (1)/The song warmed my heart (1)

The watching & moving participants wrote:

To memorize a dance (1)/ To memorize the song dancing (3)/ Moving body was enjoyable, or more enjoyable than I had expected (3)/ To sing immediately after memorizing the song (1)/ I was happy to remember the lyrics corresponding bodily movements (1)/I was better to overcome the difficult problem (1)

3.4.5 The data on the answers to Q5 (What makes the performance so difficult?) are as follows.

The listening participants wrote:

To memorize the lyrics, especially the second verse (7)/To memorize both melody and lyrics (4)/ To memorize the song by only listening (5)/ Difficult melody (5)

The watching & moving participants wrote:

Difficult melody (8)/ Difficult lyrics (2)/ To memorize the song and dance simultaneously (8)/ To memorize both melody and lyrics (1)/ To memorize the whole dance (1)/ To sing the song immediately after memorizing it (1).

4. Discussion

Four concluding remarks follow from this research. First, the number of good performance (A) of watching & moving participants were further more than that of listening participants. The former succeeded to sing the whole song catching their cue from bodily movements. The bodily movements fitted snugly to the song were certainly useful to memorize the song in a short time. Especially for those who haven't had much musical experience to memorize the song easily, these bodily movements are surely useful. However, for a person with the music ability enough to memorize an unknown song after only three listens, it doesn't matter whether she sings with the movement of the body. Furthermore, a problem that memorizing the dance as well as the song might lay the double burden on memorists remains behind, as 8 answers suggested.

Secondly, I have examined that the proprioception increase joy derived from music. A lot of watching & moving participants answered that they were interested in memorizing the song with dancing, and that moving their body was enjoyable, or more enjoyable than they had expected. In addition, I found that the bodily movement relaxed a watching & moving participant. On the other hand, listening participants seemed to concentrate their attention on listening to the song, as if they didn't want to miss even a small part of the song. Such tension will be released when the audition is accompanied with the vision and the proprioception.

Thirdly, I found that to memorize lyrics, especially the second verse of the song was difficult for listening participants, while to memorize melody was difficult for watching & moving participants. We could memorize all lyrics of the song by listening to it even three times if we get any images connecting with the lyrics. As to the poor memory of melody for watching & moving participants, melody might have the lowest priority in the order of a memory.

The fourthly, I found that the will of the participants to try to memorize the song after only three listens might influence their memory. Students in a special course showed their most concentration on memorizing the song, regardless of the ways of memory. They seemed to have a strong will to attain a goal of memorizing the whole song.

5. Conclusions

Learning a song together with the movement of the body could provide a more effective music education, especially for those who have the limited musical experience, including young children. The findings of this research should contribute to body involvement in music education.

References

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