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ORIGINAL ARTICLE

The effect of body awareness training of pre-school children based on the Sherborne Developmental Movement method versus regular physical education class

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Abstract

In the present research is investigated whether the body awareness training of pre-school children based on the Sherborne Developmental Movement method has more positive effects on when compared to a participation in regular physical education class. The research group consisted of 37 girls and 41 boys (average age 5 years and 9 months) from regular pre-school education who were randomly divided into the experimental and control group. The experimental group received a Sherborne Developmental Movement based session once per week for five weeks and one regular physical education class. The control group received a regular physical education class two times a week for five weeks. The results showed a significant improvement in receptive body awareness for the experimental group in comparison with the control group. Contrary to the expectation, the expressive body awareness of the control group showed greater progress as compared to the experimental group.

Key words: Physical education, Body awareness, Sherborne Developmental Movement

Introduction

Awareness of the body and its movement functions is a primary curriculum focus in preschool physical education within the Flemish system (Vlaams ministerie van onderwijs en vorming, [Flemish Ministry of Education], 1997). The Flemish Ministry of Education set a number of developmental goals for the physical education classes for pre-school children. These developmental goals are defined in article 44 (September 1997) as follows: “Developmental goals for pre-school education are minimum requirements concerning awareness, understanding, skills and attitudes which the government considers to be desired for the student population, and which the school should strive to accomplish.” (Vlaams ministerie van onderwijs en vorming, [Flemish Ministry of Education], 1997). For physical education, the developmental goals are separated into three components: motor competence, self-concept and social functioning, and development of a healthy and safe lifestyle. The first two components are clearly related to the importance of body awareness, of which it could be argued that the other components follow developmentally given a solid understanding of body awareness. Body awareness has been reported to be developmental whereby children are able to first point to a body part given a cue, and then later, to name a body part (Kugel, 1970; Vallae & Vandroemme, 1999; Goorhuis & Schaerlaekens, 2000).

According to Kugel (1970; 1989), the body schema is understood as the perception of one's own body and his detailed terminology (1989) is often used. According to his

conceptualization, the body schema consists of three parts: the body plan, the body awareness and the body concept.

Kugel (1989, p. 69) defines body awareness as: “the information which the person (the child) acquires via perception, or via imagining and remembering, about its own physical figure; the movements which he/she actually performs, can perform or wants to perform, in respect with direction, result and intensity; the positioning of the body as well as of the body parts in space and their positioning in relation to one another; and its own position concerning what there is or what happens in its surrounding.” Body awareness is connected to the consciousness of the outside world and the growing ego awareness. The gnostic aspects have a prominent place in body awareness: “I know my body.” (Vanlimbergen, 1995, p. 12). In a nutshell, body awareness refers to the consciousness of one’s own body.

Although the co-occurrence of developmental language and motor problems is well documented to the best of our knowledge only a few small studies have attempted to evaluate the effectiveness of a motor intervention programme. A study of Bogdanowicz (1992) reported the positive influence of “the Sherborne method” on the psychomotor development of a group of children 24 to 36 months of age and with young children who have severe mental retardation. Simons and Wouters (1996) focused on the effect of the Sherborne Developmental Movement method in a child psychiatric setting during sessions of psychomotor therapy. In this study, the body awareness was assessed with the test of Bergès and Lézine (1978). The results showed significant effects on the receptive awareness of body parts (pointing to body parts), but no significant effects on the expressive awareness of body parts (naming body parts) were found. Due to the limited number of participants (only 8 children) further research is required. A study of Rintala et al (1998) reported that the group of children following a psychomotor training programme based on the Sherborne Developmental Movement method, did improve more than those who followed regular physical education. Kazmierczak, Hagner and Kazmierczak (2005) also found significant effects on the emotional, cognitive, social and motor development of 11 children with Down syndrome, in comparison with a control group.

Body awareness is a very important component in movement awareness. The body is our first home and movement is our first language. Therefore, it is important to stimulate body awareness by means of physical or movement education (Kugel, 1970). Moreover, the more complex motor activities and motor learning processes depend upon well-developed body awareness (Van Gilst, Kugel, & Van der Straten, 1981). Thus, body awareness is very important for acquiring motor skills (Simons, 2009).

Body awareness consists partially of awareness of body parts. For the young child, in the process of becoming aware, we can speak of “giving meaning to his/her world” (Kugel, 1970, p. 72). Giving meaning, or in other words, making sense of, depends largely on language. In the process of naming, the meaning is connected to an experience, connected to the activities which the child can control (the sensory-motor schema). The child acquires first a passive language; he/she learns how to react in certain situations (receptive language). Only after this stage a child can point out objects with a name, which shows an active use of the language (expressive language). The development of language is thus shaped by the content of experience (Kugel, 1970; Vallae & Vandroemme, 1999; Goorhuis & Schaerlaekens, 2000). A child can acquire concepts of body parts while playing. Many words “are connected to” real life activities of the child or belong together with the child or with body parts. Yet as with most development, the naming of one’s own body parts is often problematic. Knees, wrists, breast, and so on, are often incorrectly indicated (Van Gilst, Kugel, & Van der Straten, 1981). For the child, it takes

developmental time to come to a full understanding of the body. This includes appropriate and directed learning experiences in physical activities at school, and the additional and complimentary learning experiences in the home environment.

Concerning the physical education program in preschool, how does participation in this curriculum compare to a more concentrated body awareness program of the Sherborne Developmental Movement pedagogy (1990)? Would participation in this program in preschool result in better body awareness for pre-school children? Current practice shows the Sherborne Developmental Movement pedagogy has been adapted for children from the regular education system: pre-school and primary school.

The Sherborne Developmental Movement method (Sherborne,1990) can be defined as a process-oriented approach in which movement plays a central role with the use of positive confirmation to strengthening the feeling of competency, the capacity to learn how to develop autonomously one's own possibilities, and the strengthening of self-awareness . The goal is to improve the awareness of one's own body and the capacity to build positive relationships mainly without using any equipment (Rogiest, 1996).

This study investigated whether the body awareness training of pre-school children based on the Sherborne Developmental Movement method has more positive effects when compared to a participation in regular physical education class.

Our three research questions were:

1. Does participation in the sessions based on the Sherborne Developmental Movement method have a more positive influence on the passive awareness (vocabulary) of body parts compared to participation in a regular physical education class, as measured by pointing to body parts of the Bergès en Lézine test (1978)?
2. Does participation in the sessions based on the Sherborne Developmental Movement method have a more positive influence on the active awareness (vocabulary) of body parts compared to the regular physical education class as measured by naming body parts of Bergès en Lézine (1978)?
3. Does participation in the sessions based on the Sherborne Developmental Movement method have a more positive influence on the child drawings (passive awareness) compared to the regular physical education class as assessed using the criteria of Goodenough (1926) drawing?

Method

Participants

Participants were 37 girls and 41 boys (N=78) preschool children ($M=5$ years and 9 months of age), all Caucasian with a mixed socioeconomic status recruited from four preschools in Flanders, Belgium. The children were randomly divided into an experimental and a control group for each school. The experimental group consisted of 42 children (24 girls and 18 boys). They participated in one Sherborne Developmental Movement based session and one regular physical education class per week for a period of 5 consecutive weeks. The control group consisted of 36 children (13 girls and 23 boys). They participated twice a week in the regular physical education class.

Table 1 gives a description of the average age and of the standard deviation of the age of the boys and girls at the pre-test measurements. There was no significant difference in age

between the boys and the girls ($t_{(76)}=0.12$, p -value= n.s.). The average age was not significantly different between the experimental and the control group ($t_{(76)}= -0.84$, p -value= n.s.).

Table 1. Mean and standard deviations of age for boys and girls of the experimental and the control group.

	Age boys M (SD)	Age girls M (SD)
Control group	69 months (4 months)	69 months (4 months)
Experimental group	68 months (3 months)	68 months (3 months)
Total group	69 months (4 months)	68 months (4 months)

This study was approved by the local Ethics Committee and performed in accordance with the ethical standards laid down in the declaration of Helsinki. The parents of all participants gave written informed consent. All children gave their assent.

Procedure

The present study analyzed the body awareness of preschool children using two methods. First, the section “*showing and naming*” of the “*Imitation of gestures*” by Bergès and Lézine (1978) was used to test the verbal awareness of body parts, consisting of receptive body awareness vocabulary (showing body parts) and expressive body awareness vocabulary (naming body parts). Second, the non-verbal awareness of body parts was investigated with the help of child drawings assessed according to the test “draw a person” test by Goodenough (1926). The parents gave written approval for their child’s participation in the research. All parents of the selected children gave their consent. The children gave their assent.

Four student interns from the department of teacher training of the University College conducted the sessions based on the Sherborne Developmental Movement method. They were supervised by an expert in the Sherborne Developmental Movement method, trained and found reliable. These interns also conducted the children’s drawing sessions of Goodenough (1926). The questionnaire sessions (Bergès and Lézine, 1978) were conducted by two testers trained and supervised by an expert in the Bergès and Lézine protocol.

Pre-test

During the pre-test, the questionnaires from Bergès and Lézine (1978) were administered and the children’s drawings (Goodenough, 1926) were completed. The questionnaires of Bergès and Lézine (1978) were individually administered during school hours. Two expert testers conducted the test. The testers practiced together before the actual testing to ensure that the same procedure was used by both. The children were brought in one by one where they took a place on a mat together with the tester. After a short explanation the testing started. The tester responded with a neutral reaction for every answer and made little eye contact with the child going quickly through the list of body parts. In order to avoid influencing the completing of the questionnaires, the testers did not know which children belonged to the experimental group.

The “draw a person” assessment of body awareness (Goodenough, 1926) was done in class by all children. The children were seated at their table where a piece of paper and pencil was found. They were given instructions to draw a child and there was no time limit foreseen.

According to the manual the different body parts were scored by the two researchers blind for the names of the children.

Post-test

In the 7th week the post-testing was conducted consisting again of the child's drawing and the test of Bergès and Lézine (1978). The same procedure as during the pre-testing was used. The drawings of the children were assessed according the criteria of Goodenough (1926) whereby the two researchers who scored the tests were blind for the names of the experimental and control group (see Figure 1).

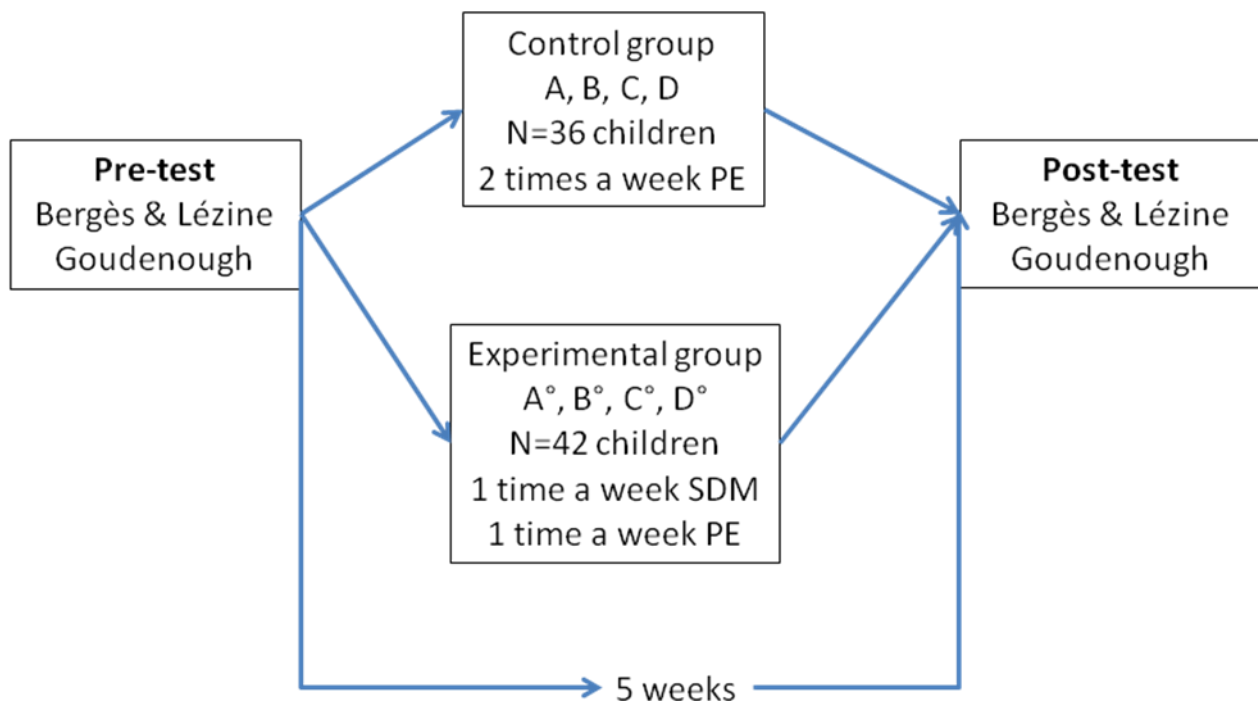


Figure 1: Flow diagram

Instruments

The testing was aimed to measure the children's receptive and expressive body awareness. The test "*Imitation of gestures*" by Bergès and Lézine (1978), translated into Dutch by Vanlimbergen (1995), was used to test the body awareness. This test investigates three aspects of body awareness and one section of the original test was used, namely the assessment of the receptive and expressive body awareness. The tester asks the child to either "show" (point to) or "name" the body part (Bergès & Lézine, 1978). This section of the test can be given to children between 3 and 6 years of age. The test includes 34 body parts. The first part tests the receptive body awareness. The child is asked first to point to the body parts on his/her own body, then on the body of the tester. The second part tests the expressive body awareness. Using

Cronbach's alpha, the reliability of this questionnaire in this research was calculated and found acceptable (alpha = 0.82 for "name," alpha= 0.81 for "show" and alpha = 0.89 for the total questionnaire).

The second test used in this study investigates the non-verbal awareness the child has of his/her body parts. To this purpose, the standardized procedure of Goodenough (1926) was used to score the 'draw a person' test. The drawing of a person/child gives a good indication of the awareness that the child has of his/her own body parts. The child draws only things that he/she knows or remembers, not what he/she sees in front of the eyes (Goodenough, 1926). The 'draw a person' test therefore gives a good image of the awareness and the way the child experiences his/her own body (Holle, 1977). The children were given the task to "draw a child as nicely as you can." The testing did not take into account the quality or the originality of the drawing. Only the quantitative aspects of the drawing were included. For the assessment of the drawings the method of Goodenough (1926; p.90-110; p.111-153; p.155-161) has been used.

The Goodenough method (1926) is applicable to drawings of children of age 3 to 13 years old. Fifty-one items are assessed, each one receiving a point when they appear in the drawing. The researcher checks the presence of all body parts, the presence of clothing items, and the correct positioning of body parts. Goodenough applied the test to 194 first grade children and found a test-retest reliability of $r = 0.94$. He also tested children of 5 to 10 year old and found a reliability of $r = 0.77$ (split half reliability with a mean correlation $r = 0.77$). In the present study, the 51 items were checked by the researcher on the children drawings at the pre- and post-testing.

Children's Program

At each of the four schools, the children in the experimental group participated into the sessions based on the Sherborne Developmental Movement method (1990) once a week and in the regular physical education program once a week for five weeks. The Sherborne Developmental Movement sessions were directed by the interns and the physical education program was directed by the school's physical education teacher. The control group participated in a regular physical education class at their school two times a week. Their class was directed by their regular physical education teacher for the duration of the five weeks.

The Sherborne Developmental Movement method (1990) provides an opportunity for the participant to move their body through an enormous range of physical positions and the accompanying movements. It is focussing on the awareness of 'my physical self', emotional and physical security, increasing confidence, learning different ways of communicating, being and feeling creative, and awareness of the environment. The Sherborne Developmental Movement pedagogy is built around three goals. The first goal is the body awareness of the participant. Special attention is paid to awareness of: the trunk, the weight-carrying body parts (buttocks, knees) and the peripheral body parts (hands, feet, arms, legs). The young child discovers the trunk, the centre of the body and the connections between the extremities. This helps the child to develop a feeling of body unity and awareness that all body parts relate to each other. The second goal is built around relationships, such as "care" relationships, "against" relationships and "together" relationships. According to Sherborne (1990), body awareness and awareness of the existence of others are preconditions for good learning. She also taught that a child's awareness of his/her own and body of others is needed in order to learn to make conscious movements. The

third goal refers to the exploration of space, such as discovering the space we are in and the space we take up (Van der Perren, 1996).

The Sherborne Developmental Movement sessions were the same across all four school settings. The exercises were aimed at achieving awareness of one's own body and the bodies of others. The theme used for the classes was the coming of spring and the return of insects and animals. The children were encouraged to use their bodies in different possible ways to represent the coming of spring. Sometimes the children worked together to represent the same thing. According to the method of Sherborne, the different body parts were repeatedly named in order to make the exercises clearer for the children (Hill, 2006).

The regular physical education classes were taught by the regular physical education teachers of the four participating schools. These classes could have differed from school to school, but a great degree of similarity was found while the research was being conducted. Each physical education class used catch games, bicycle routes, obstacle courses and ball games. In classical physical education classes children are taught where their body needs to be and what it needs to do in order to execute motor skills. Sometimes this involves equipment (i.e. catching, throwing, kicking, striking) and sometimes not (i.e. running, jumping, hopping). In doing so, children learn the names of their body parts and where they need to be in space to execute a movement skill from the verbal, visual and tactile instruction of their teacher.

Analyses

For this research, the interaction effects between the group and the testing instruments were analysed using an ANOVA. The differences between the pre- and post-testing were examined with a post-hoc test, namely using Tukey Honestly Significantly Different test (Tukey HSD). The differences between the experimental and the control group were taken into account with the help of a *t*-test for independent samples. To assess the amount of improvement the relative growth was taken into account for both groups [(score retest – score test) / score test]. This method was especially chosen because the starting level of body awareness was not the same for the experimental and control group.

Results

1. *Research Question 1:* Does participation in the sessions based on the Sherborne Developmental Movement method have a more positive influence on the passive awareness (vocabulary) of body parts compared to participation in a regular physical education class, as measured by pointing to body parts of the Bergès and Lézine test (1978)?

A significant interaction effect was found between the groups on two different time points $F_{(1, 78)}=4.16, p=.05$ (see Figure 2). The children of both groups pointed to more body parts at the post-testing: the experimental group had first ($M=24.67, SD=2.07$) and then ($M=25.96, SD=2.49$) and the control group had first ($M=22.45, SD=3.19$) and then ($M=24.86, SD=3.24$). The difference between the pre- and post-testing was larger for the control group ($p=.0001$) than for the experimental group ($p=.005$).

The groups differed significantly at pre-testing ($t_{(80)} = 3.87, p = .0002$): the experimental group had ($M = 24.67, SD = 2.07$) and the control group ($M = 22.45, SD = 3.19$). Although the children of the experimental group ($M = 25.96, SD = 2.49$) scored also at the post-testing higher

than the control group ($M=24.86$, $SD=3.24$), the difference was not significant ($t_{(78)} = 1.72$, $p=.09$).

Because of the difference at the beginning, we compared also the relative growth of both groups. The relative growth of the experimental group ($M=.06$, $SD=.11$) is significantly smaller ($t_{(78)} = -2.35$, $p=.02$) than the one of the control group ($M=.11$, $SD=.11$). In contrast to our expectations children in the control group made significant more improvements than the experimental group in naming different body parts (see Figure 2).

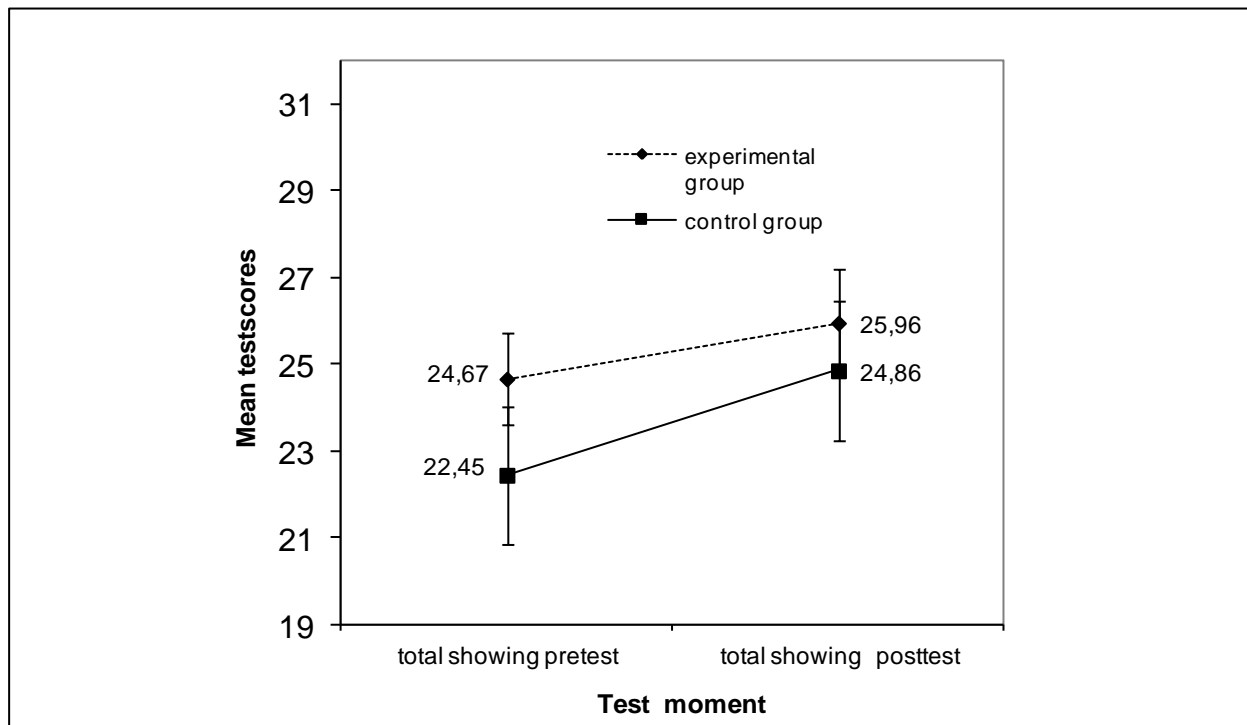


Figure 2. Mean and standard deviations for the item ‘showing’ of the test of Bergès and Lézine (1978) for the experimental and the control group.

2. *Research Question 2:* Does participation in the sessions based on the Sherborne Developmental Movement method have a more positive influence on the active awareness (vocabulary) of body parts compared to the regular physical education class as measured by naming body parts of Bergès and Lézine (1978)?

There is no significant interaction effect between the groups on two different time points $F_{(1, 78)}=.14$, $p=.71$ (see Figure 3). The children from both groups were able to name significantly more body parts at post-testing than at the pre-test. The experimental group first had ($M=23.24$, $SD=2.21$) and at the end ($M=24.82$, $SD=2.57$) and the control group the score raised from ($M=21.84$, $SD=3.56$) to ($M=23.59$, $SD=3.9$). The difference between pre- and post-testing was significant in both groups ($p=.0002$ for the experimental group and $p=.0002$ for the control group).

The active awareness of the two groups already differed significantly at pre-testing $t_{(80)} = 2.12$, $p=.04$): the experimental group had $M=23.24$, $SD=2.21$ and the control group $M=21.84$, $SD=3.56$. Although the children of the experimental group ($M=24.82$, $SD=2.57$) scored higher

than the control group ($M=23.59$, $SD=3.9$) at the post-testing, the difference was not significant ($t_{(78)}=1.68$, $p=.1$).

Due to the differences present at the beginning we also compared the relative growth of both groups. The relative growth of the experimental group ($M=.07$, $SD=.08$) is not significantly lower ($t_{(78)}=-.69$, $p=.49$) than that of the control group ($M=.08$, $SD=.11$). The experimental group did not improve significantly more than the control group (see Figure 3).

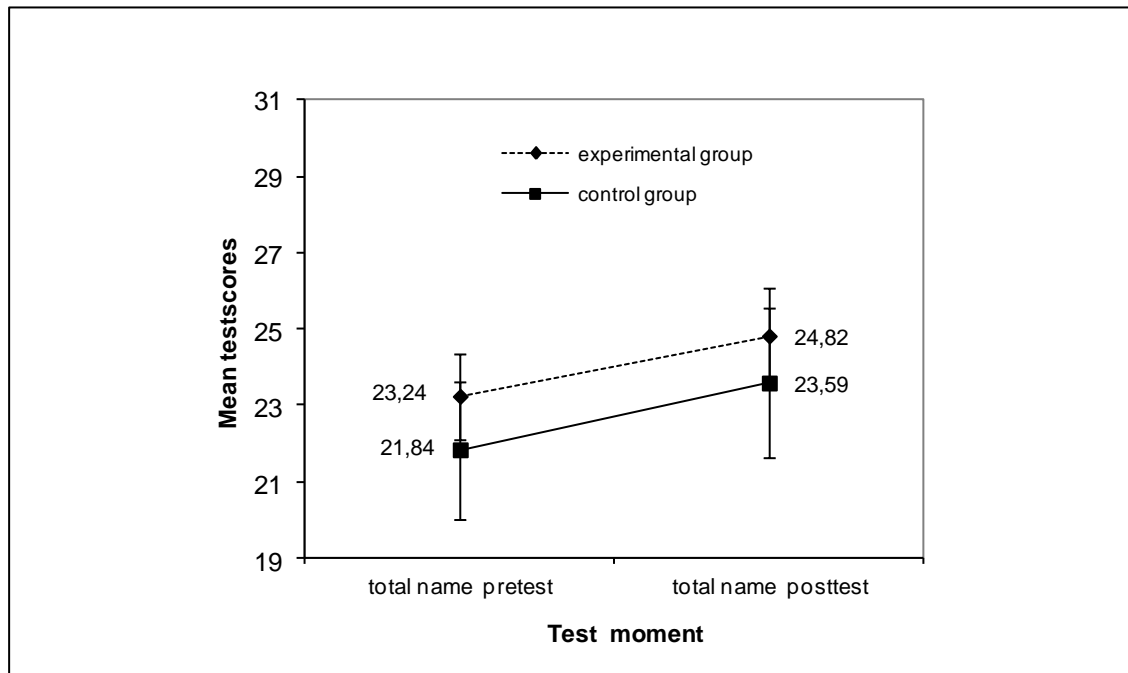


Figure 3: Mean and standard deviations for the item ‘name’ of the test of Bergès and Lézine (1978) for the experimental and the control group.

3. *Research Question 3:* Does participation in the sessions based on the Sherborne Developmental Movement method have a more positive influence on the child drawings (passive awareness) compared to the regular physical education class as assessed using the criteria of Goodenough (1926) drawing?

There is a significant interaction effect between the groups and the results of the drawings of the children $F_{(1, 76)}= 6.61$, $p=.01$ (see Figure 4). The children of the experimental group could draw significantly more body parts at the post-testing [pretest ($M=15.86$, $SD=4.33$) post-test ($M=18.45$, $SD=4.10$), $p=.005$]. For the control group, the difference between the pre-testing ($M=16.78$, $SD=4.88$) and post-testing ($M=16.56$, $SD=3.32$) was not significant. ($p=.99$).

At the pre-testing the groups did not significantly differ ($t_{(78)}=-.87$, $p=.39$). The children of the experimental group ($M=15.86$, $SD=4.33$) scored somewhat lower than the ones of the control group ($M=16.78$, $SD=4.88$). At the post-testing however, the experimental group ($M=18.45$, $SD=4.10$) scored significantly higher ($t_{(79)}=2.55$, $p=.01$) than the control group ($M=16.56$, $SD=3.32$).

As a result of this, the relative growth of the experimental group ($M=.25$, $SD=.45$) and that of the control group ($M=.04$, $SD=.27$) differed significantly ($t_{(76)} = 2.41$, $p=.02$). The experimental group improved significantly more than the control group (see Figure 4).

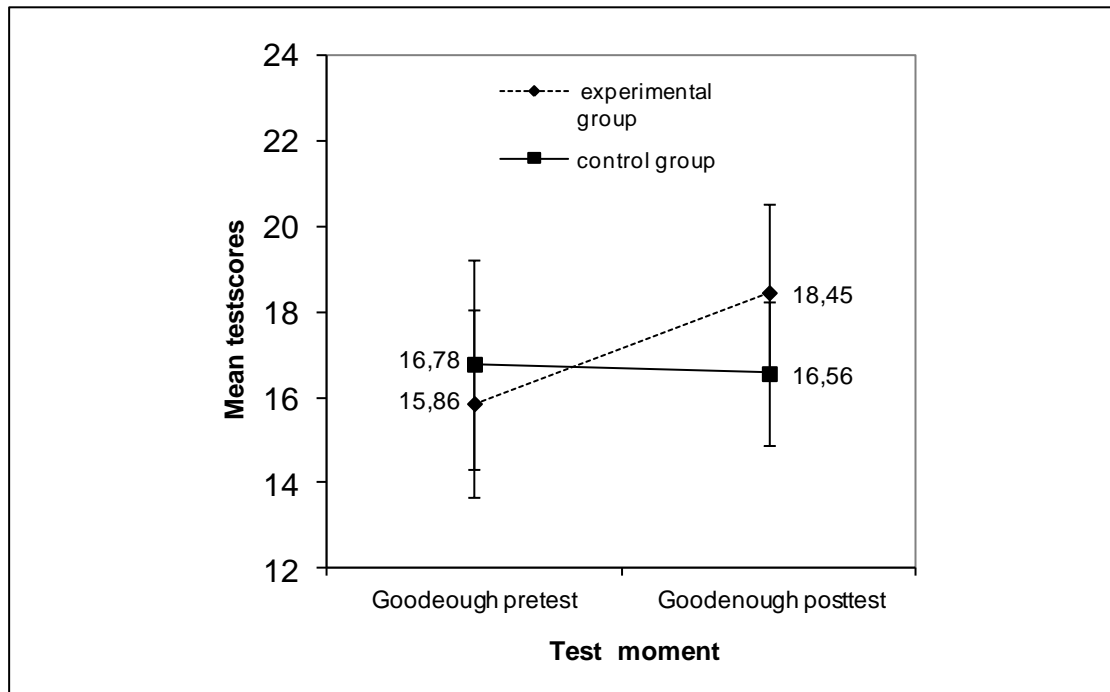


Figure 4: Mean and standard deviation for the drawing according the criteria of Goodenough.

Discussion

The aim of this study was to investigate whether the applied Sherborne Developmental Movement method (1990) has a positive influence on the body awareness of children of the 3rd pre-school class (5 – 6 years old) of the regular education system compared to the regular physical education class. In this study the topic has been investigated with the help of 3 research questions addressing various aspects of body parts awareness.

First we were interested in the possible growth of pre-school children's receptive body awareness. Therefore, we compared the effect of two methods (Sherborne Developmental Movement method and regular physical education). This was accomplished with the help of the section "show (point to)" of the test "*Showing and naming*" of Bergès and Lézine (1978). According to the standardized list provided by Bergès and Lézine, the 5 year olds scored an average result of $M=21$ while the 6 year olds scored at an average of $M=27$ for the "show" section of this test. The average age for our participants was 5 years and 9 months at the pre-testing. Although there was no significant difference in age between the experimental and the control group they scored significantly different at pre-testing. The experimental group ($M=24.67$, $SD=2.07$) scored closer to the standard for the 6 year olds. The average score of our control group ($M=22.45$, $SD=3.19$) was closer to the 5 year old standard than to the 6 year old

standard of the original Bergès and Lézine test. The control group, thus, scored rather poorly at the pre-test measurements of receptive awareness of body parts.

During the intervention period both the control and the experimental group made significant progress. Contrary to the hypothesis, the control group made more progress than the experimental group. However, the fact that the control group scored significantly lower at pre-testing can partially be accounted for by the significantly greater progress of this group in comparison to the experimental group. The control group had to catch up much more in order to reach the standard for 6 year olds. It can be argued that they picked up new aspects of body awareness faster.

We were not only interested in the receptive body awareness but also in expressive awareness of body parts. We used the section “name” of the test “*Showing and naming*” of Bergès and Lézine (1978) to measure this. Both the experimental and control group made significant progress during the intervention period. The working hypothesis that the Sherborne Developmental Movement method would stimulate more the expressive body awareness was not supported by the results. The two groups made comparable progress contrary to the hypothesis. The control group showed a tendency, of slightly better progress in expressive body awareness than the experimental group. In this case, too, the control group scored rather low at the pre-test measurements ($M=21.84$, $SD=3.56$) in comparison with the standard score of Bergès and Lézine ($M=20$ for 5 year olds and $M=24$ for 6 year olds for the “name” section). In comparison, the experimental group score rather high at pre-test ($M=23.34$, $SD=2.21$) and therefore had to make less progress to keep the standard score at the post-test measurements.

It appears that the control group scored significantly lower at pre-test for both expressive and receptive body awareness, in comparison with the experimental group (also a low score for their age according to the standard of Bergès and Lézine, 1978). At a closer look, the control group consisted of more boys than girls. One speculates that girls of that age may have a better expressive and receptive body awareness than boys. There is, to our knowledge, no literature available on the expressive body awareness by boys as compared to girls in this age group. More research on this topic is needed.

During the intervention period, the control group showed a tendency to catch up, for expressive body awareness, and especially visible, for receptive body awareness. This can be explained by the fact that children’s receptive language develops faster than their expressive language (Goorhuis & Schaerlaekens, 2000). According to Bergès and Lézine (1978, p. 72), the 5 year olds show a standard of $M=20$ for “name” (expressive awareness) and a standard of $M=21$ for “show” (receptive awareness). For 6 year olds the standard is $M=24$ for “name” and $M=27$ for “show.” This shows a much better progress in receptive body awareness in the transition period from 5 to 6 year old. It was thus to be expected in our research also that more progress was made in receptive body awareness over the intervention period.

Further we also looked at the effect of the intervention program on the children’s body awareness as reflected in children drawings assessed following the criteria of Goodenough (1926). As expected, the experimental group made significantly more progress during the intervention period. This was the case using both criteria. The “Sherborne Developmental Movement” had more influence than the regular classes on the children drawings. Moreover, the two groups started on an equal level; the experimental group did not show significantly lower scores at the pre-testing. At the same time, the post-test measurements showed significantly higher scores for the experimental group. In this case, an unequal starting point can not invalidate the results. Therefore, Sherborne Developmental Movement method had a clear

positive influence. The relative growth shows significant progress for the experimental group. The Sherborne Developmental Movement method had a positive effect on children's non-verbal body awareness.

In summary, a positive effect of the Sherborne Developmental Movement method could be proven only for research question 3, where the non-verbal awareness of body parts was tested. For the research questions 1 and 2, where the verbal awareness of body parts was tested, the hypothesis was rejected. A possible explanation for this could be that the progress that the children clearly made in the area of body awareness over the intervention period, expressed itself only non-verbally in the children drawings.

Limitations of the study

The intervention period was most probably too short to show results in the test of Bergès and Lézine (1978). In the study of Simons and Wouters (1996) the Sherborne Developmental Movement method was used in 14 sessions. In comparison, our research offered the experimental group only 5 sessions, and these were mixed with regular physical education lessons in-between the sessions. This could have provided some contextual interference for the children and thus weaken the “vocabulary” they were learning in the Sherborne based approach. For the future, it would be preferable for similar research to follow the Sherborne Developmental Movement method for more consecutive weeks and with a larger experimental and control group.

The fact that the children were selected and split out in two groups in the four participating schools and this based on the agreement of the parents and the children makes that the starting level of body awareness for the experimental and control group was not equal. This was countered by using the method of the relative growth.

Another possible weakness of the study is that in spite of the fact the four student interns were trained and supervised and the sessions were built on in the same way, one could remark that this is inconsistent with the philosophy of the Sherborne Developmental Movement approach. This is why we choose for an approach were they worked around a certain theme, with the same aspects in the four groups. And of course the sessions were not exactly the same, but by doing so we made it possible to gather the data from the whole group. For the future a maybe better design could be where the experimental group starts with an intervention based on the Sherborne Developmental Movement method followed by regular physical education class. To do so we need to overcome some practical problems, because it now takes already 7 weeks to finish the research and then it will take the double witch is very difficult to reach in one school year. Therefore a possible alternative could be to apply this on a group of language deleted children, where we could expect a more positive result.

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References

- Bergès, J. & Lézine, I. (1978). *Test d'imitation de gestes: [Imitation of gestures]Techniques d'exploration du schéma corporel et des praxies chez l'enfant de 3 à 6 ans* (2^e editie). Paris: Masson.
- Bogdanowicz, M. (1992). The results of the research on the effectiveness of the Sherborne method in Poland. *Issues in special education and rehabilitation*, 7(2), 81-86.
- Goodenough, F. L. (1926). *Measurement of intelligence by drawings*. Yonkers on-Hudson: N.Y. World book company.
- Goorhuis, S. M. & Schaerlaekens, A. M. (2000). *Handboek taalontwikkeling, taalpathologie en taaltherapie bij Nederlandssprekende kinderen.[Handbook language development, pathology and therapy at Dutch-speaking children]*. Utrecht: de Tijdstroom.
- Hill, C. (2006). *Communicating through movement: Sherborne development movement- towards a broadening perspective*. Sunfield: Sunfield Publications.
- Holle, B. (1977). *De motorische ontwikkeling van normale en geretardeerde kinderen: een praktische gids voor senso-motorische stimulatie. [The motorial development of normal and retarded children: practical guide for senso-motorial stimulation]*. Amsterdam: Swets & Zeitlinger B.V.
- Kazmierczak, U., Hagner, W. & Kazmierczak, M. (2005). Effect of Weronika Sherborne's kinesitherapeutic method on the development of children with slight mental handicap suffering from Down's syndrome. *Fizjoterapia*, 13(3), 67-71.
- Kugel, J. (1970). Het lichaamsbesef. *Lichaamsplan, lichaamsbesef, lichaamsidee* (pp. 68-78). [The body notion. *body plan, body notion, body idea*] Groningen: Wolters-Noordhoff.
- Kugel, J. (1989). *Psychologie van het lichaam [Psychology of the body]* (7de uitgave). Utrecht: Het Spectrum.
- Rintala, P., Pienimäki, K., Ahonen, T., Cantell, M. & Kooistra, L. (1998). The effects of a psychomotor training programme on motor skill development in children with developmental language disorders. *Human Movement Science*, 17, 721-737.
- Rogiest, H. (1996). De bewegingspedagogiek van Veronica Sherborne bij gezinnen met een auditief gehandicapt kind. In J. Simons (Red), *Actuele themata uit de psychomotorische therapie* (pp. 51-58). [The Sherborne Developmental Movement at families with auditory disabled children. In J. Simons, *Current themes from psychomotor therapy*] Leuven: Acco.
- Sherborne, V. (1990). *Developmental movement for children: Mainstream, special needs and pre-school*. Cambridge: Cambridge University Press.
- Simons, J. (2009). *Introductie tot de psychomotoriek. [Introduction to psychomotricity]*Antwerpen: Garant.
- Simons, J. & Wouters, I. (1996). Evaluatie van de bewegingspedagogiek van Sherborne tijdens de psychomotorische therapie bij een kinderpsychiatrische populatie. In J. Simons (Red), *Actuele themata uit de psychomotorische therapie* (pp. 83-92). [Evaluation of Sherborne Developmental Movement during psychomotor therapy in a group of children from child psychiatry. In J. Simons, *Current themes from psychomotor therapy*] Leuven: Acco.
- Vallaey, M. & Vandroemme, G. (1999). *Psychomotoriek bij kinderen. [Psychomotricity in children]* Leuven: Acco.
- Van der Perren, W. (1996). De bewegingspedagogiek van V. Sherborne: Naar het hart van wat 'opvoeden' is. [The Sherborne Developmental Movement: To the heart of what educating is.] *Kleuters & Ik*, 16(2), no pages.
- Van Gilst, J., Kugel, J., & Van der Straten, K.G. (1981). *Bewegingsopvoeding voor het kind met ontwikkelingsstoornissen.[Movement education for the child with development impairments]* Nijkerk: G.F. Callenbach.
- Vanlimbergen, P. (1995). *Test lichaamsschema,[Test Body scheme]* Herentals: Psidico.
- Vlaams ministerie van onderwijs en vorming.[Flemish Ministry of Education] (1997). *Decreet basisonderwijs: artikel 44*. Opgehaald maart 14, 2007, van <http://www.ond.vlaanderen.be/edulex/database/document/document.asp?docid=12254#135347>