Effect of Psychomotricity Program on Anxiety, Withdrawal and Problem Behavior of Children with Asperger Disorder

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Abstract
Background/Objectives: To investigate the effect of applying the psychomotor program on the anxiety, withdrawal and problem behaviors of children with Asperger disorder, which helps improving their confidence by motion activity.

Methods/Statistical Analysis: Psychomotricity program was conducted for 50 minutes per session, three sessions a week during 12 weeks against the subjects, two children with Asperger disorder. BAB design was used to analyze the effect of psychomotricity on problem behaviors of the children with Asperger disorder. Problem behaviors were measured for 10 minutes after every 50 minute class using an interval recording method. To confirm the effect on anxiety were conducted using Child Behavior Check List (CBCL) 6-18.

Findings: The average occurrence frequency of target behavior of child A, which was more than 9 times lower than the average and target behavior of child B, which was more than 11 times lower than the average. As a result of this study, frequency of problem behaviors of the children with Asperger disorder was decreased during the arbitration and this decrement was maintained until the follow up observation. Also, anxiety problem in pre-observation of the child A was 80 and that of the child B was 90. In the post-observation T score of anxiety problem of the child A was 60 and that of the child B was 69. The anxiety level on post-observation was lower than that on pre-observation.

Application/Improvements: We suggest that psychomotricity is effective in reducing the aggression behavior and withdrawal frequency of children with Asperger disorder and in maintaining the lowered level.

Keywords: Anxiety, Asperger Disorder (Syndrome), Problem Behavior, Psychomotricity, Withdrawal

1. Introduction
Children and adolescents experiencing emotional or behavioral disorder suffer from emotional instability and cognitive or behavioral difficulties. The possible etiological cause has been supposed to be a neurological problem. Asperger disorder (AD), one of the emotional or behavioral disorders, is a representative neurodevelopmental disorder.

Following the definition, Asperger disorder is diagnosed only when the average cognitive and verbal development are accompanied. The definition also includes damages in establishing social relationship, in nonverbal communication, limited interests and lack of flexible thinking. The first typical feature to diagnose the disorder is defect of social skills, which may lead to social isolation. The deficiency in sociality causes the low peer acceptance, and finally can cause the difficulty in making friends and developing a friendship.

As a sub-type of pervasive developmental disorder, Asperger disorder is characterized by defect in social interaction, limited stereotyped movement, and restricted interests without delayed cognitive or language development.

Children with Asperger disorder in childhood period, especially who are entering the adolescent period, have
difficulty in controlling their stress coming from failure of adapting themselves to building complicated social relationship\textsuperscript{6,7}, so they experience a higher level of anxiety than non-disabled or high-functioning autism children do\textsuperscript{8}.

Self-esteem formed by making social relationship is reported to be lower in children with Asperger disorder and finally this lowered self-esteem causes their behavioral problems such as anxiety, withdrawal and aggression\textsuperscript{9}. Self-esteem is one of the psychological emotions necessary to live one's life in a more positive way. Factors affecting the self-esteem are income and economic satisfaction, career, social status, social role and so on. Health, activity of daily living, and social activities, such as participating in social and religious activities, are the important factors to improve one's self-esteem\textsuperscript{10}. The psychomotricity is defined as a “physical activity” to improve holistic development through voluntary experience away from ability- or merit-based arbitration\textsuperscript{11}.

This study is to investigate the effect of applying the psychomotor program on the anxiety, aggression, and problem behavior of children with Asperger disorder, which helps improving self-confidence by motion activity.

2. Research Methods

2.1 Subjects of Research
The subjects of this study were two children, 10-year-

| Table 1. Characteristics of the subjects |
|-----------------------------------------|
| Child A | Child B |
| Gender | Male | Male |
| Age | 10-year and 3-month | 11-year and 8-month |
| CBCL 6-18 |
| · Internalization scale T score : 87 | · Internalization scale T score : 83 |
| · Externalization scale T score : 70 | · Externalization scale T score : 68 |
| · Total Problem behavior total scale T score : 83 | · Total Problem behavior total scale T score : 79 |
| Syndrome subscale |
| · Aggression behavior T score : 85 | · withdrawal/depression T score : 78 |
| · attention, concentration problem T score : 69 | · anxiety/depression T score : 68 |
| DSM diagnostic scale |
| · anxiety problem T score 79 | · anxiety problem T score : 81 |
| · behavior problem T score : 75 | · somatization problem : 72 |
| Problem behaviors |
| · obsession with punctuality | · obsession with punctuality |
| · emotion explosion | · inadequate handling of situation |
| · no emotional exchange with partner | · keep reading other’s countenance |
| · violence | · no expression of one’s opinion |
| · yelling out one’s insistence | · crying to express one’s feeling |
| · bumping into surroundings | |
old and 11-year-old boys with their guardians’ approval, who were diagnosed with Asperger disorder and anxiety disorder by the psychiatrist. The problem behaviors tested in the study were selected by the diagnostic criteria of anxiety disorder suggested in DSM-IV-TR (2000). General characteristics of the subjects are described in Table 1.

### 2.2 Research Process

The research was designed according to ‘BAB design’ method and conducted for 50 minutes per session, three sessions a week during 12 weeks, for 36 sessions in total.

The prior observation was progressed from a week before the beginning of research session to select target behaviors and detailed target behaviors are described in Table 2.

### Table 2. Target behaviors of child A and child B

| Subject | Problem behavior          | Target behavior                                                                 |
|---------|---------------------------|---------------------------------------------------------------------------------|
| Child A | Aggression and violence behavior | Yelling with emotion explosion  
|         |                           | Stamping one’s hands or feet and hitting an object  
|         |                           | Unintended collision with an object or a person |
| Child B | Withdrawal behavior       | Hyperactivity in a specific situation  
|         |                           | Heading down and reading other’s countenance  
|         |                           | Crying during the program or giving up on a conversation or a trial of conversation |

### 2.3 Application program

Psychomotricity programs are composed to induce the children with Asperger’s disorder to active pleasantly, to solve problems and to voluntarily engage in programs with references to the psychomotor physical activity program conducted by[12,13]. Weekly component areas and subject contents of the psychomotricity program are described in Table 3.

### 2.4 Data Collection

Measurement of target behaviors was conducted in the order of pre-observation, arbitration (B), reversal (A), re-arbitration (B), and post-observation. Data were collected by contents of video recording of children after each class for 10 minutes which was written on the observation paper of behavioral problem using an interval recording method.

\[
\text{target behavior agreement} + \frac{\text{disagreement}}{\text{target behavior agreement}} \times 100
\]

A formula to get a reliability between observers for the occurrence frequency of anxiety problem is described as the sum of agreements and disagreements of target behaviors divided by agreement of target behaviors then multiply by 100. The reliability between observers was measured at each session of re-arbitration, reversal, and post-observation period. The results of the reliability between observers for the occurrence frequency showed that the average of child A for each session was 91.44%, the average of child B was 94.2%, and finally the average of two children was 92.8%.

Anxiety level was measured twice, at the pre-observation and the post-observation, by the assessment of CBCL 6-18 for the parents.

### 3. Results

#### 3.1 Result of Occurrence Frequency of Target Behavior

As shown in Figure 1, the average occurrence frequency of target behavior of child A was 12.6 in the arbitration section, and the average in the reversal section was 14.5 showing the increase of 2 in average.
Table 3. Weekly component areas and subject contents of the psychomotricity program

| Week  | Component areas                   | Subject contents                                                                 |
|-------|-----------------------------------|----------------------------------------------------------------------------------|
| 1     | **Rapport formation**             | Rapport formation and monitoring the movement, releasing energy (rapport formation, monitoring the movement) |
| 2     | **Body awareness improvement**    | Releasing energy, holding a balloon using any part of one's body without arms - Adaptation to easy task, raising degree of difficulty |
| 3     | **Body awareness improvement**    | Experiencing & making one's hideout - finding one's comfortable space, making one's comfortable space |
| 4     | **Body awareness improvement**    | Releasing energy and application of STOP & GO - moving fast, adapting to STOP & GO |
| 5     | **Reversal period**               | Playing one's favorite game                                                      |
| 6     | **Reversal period**               | “We are on a camping” – reproducing a memorable game recalling and talking about one's camp, building a campsite |
| 7     | **Material experience**           | Experiencing a rollbrett – experiencing and utilizing a rollbrett               |
| 8     | **Material experience**           | Rollbrett sliding – suggesting utilization method of rollbrett, thinking out one's idea of utilizing method |
| 9     | **Social improvement**            | Suggesting a game – The Prince and the Pauper game, modifying the rules of the game |
| 10    | **Social improvement**            | Making a game – sports game – making a modified game based on the suggested one, enjoying the completed game |
| 11    | **Social improvement**            | Reacting according to the response of the partner – giving consideration to counterpart in the game, taking care of each other |
| 12    | **Social improvement**            | Composing a game – making and plying a new game, modifying the rules with idea of a new game |
| 13    | **Follow-up period**              | Playing one's favorite game                                                      |

Figure 1. Occurrence frequency of target behavior for child A.
The average occurrence frequency in the re-arbitration section was decreased to 11.8 similar to the first arbitration section.

The average frequency of the post-observation section was 5.3, which was more than 9 lower than the average in the re-arbitration section.

As shown in Figure 2, the average occurrence frequency of target behavior of child B was 8.9 in the arbitration section, and the average in the reversal section was 14.3 showing the increase of 5.4 in average. The average occurrence frequency in the re-arbitration section was decreased to 7.8 as low as the average of the first arbitration section again.

The average frequency of the post-observation section was 3, which was more than 11 lower than the average in the re-arbitration section.

### 3.2 Result of the Anxiety Problem Between Pre- and Post-Observation

As shown in Figure 3, child A and B both were verified to have anxiety problem showing the high T score over 70, a standard of the clinical range. T score of anxiety problem in pre-observation of child A was 80 (clinical range) and that of child B was 90 (clinical range).

![Figure 2. Occurrence frequency of target behavior for child B.](image1)

![Figure 3. Comparison of the anxiety problem between pre- and post-observation.](image2)
In the post-observation, T score of anxiety problem of child A was 60 (normal range) and that of child B was 69 (associate clinical range).

4. Discussion

The purpose of this research is to investigate any changes in anxiety and withdrawal or aggression behavior of children with Asperger disorder by the application of psychomotricity, to confirm the maintenance of the positive changes after the application of the program, and finally to provide basic information to develop programs for children with Asperger disorder to build positive self-esteem by psychomotricity.

The interpretation of the results has something in common with the previous research related to the problem behaviors of children with Asperger disorder of 14, which shows the light exercise such as walking is effective in reducing anxiety of children with Asperger disorder, suggesting the requirement of arbitrating the prevention and causation for the occurrence of problem behaviors even though arbitration of the problem behaviors is helpful to solve social problems.

According to the previous researches about psychomotricity, it helps to change one’s negative self-awareness and dissatisfaction into emotional stability through active physical movements 15, and also it contributes to development of positive self-conception, improvement in communication by self-expression and overall development of sociality, emotion and body based on the physical movements 16,17. In addition, the psychomotricity is reported to have positive effect in reducing problem behaviors of students with autistic disorder 12.

As shown in the results, the occurrence frequency of target behaviors of children with Asperger disorder was diminished during the application period of the psychomotor program and also this low frequency level was retained even after the termination of the program.

In conclusion, it is considered that the psychomotor program is effective on relieving the target behaviors, such as aggression or withdrawal, of children with Asperger disorder.

In terms of the anxiety problem, the score of anxiety was also lightened from a clinical range to a normal range or an associate clinical range in both child A and B.

This part of the results corresponds with the result of, which suggests that physical movement decreases anxiety of teenagers with Asperger disorder, and also with the result that behavior intervention reduces problem behaviors of people with autism spectrum disorders 19.

Thus, we suggest that psychomotricity is effective in reducing the aggression behavior and withdrawal frequency of children with Asperger disorder and in maintaining the lowered level. According to the results, aggression behavior and withdrawal frequency of children with Asperger disorder were decreased in psychomotor program-applied arbitration and re-arbitration periods, and reduced level of withdrawal and aggression behavior was maintained even after the termination of the program. In terms of anxiety, it is suggested that psychomotricity has positive effect in relieving the anxiety of children with Asperger disorder and in maintaining the lowered level of anxiety, as the score of anxiety was lightened from a clinical range to a normal range for child A, to an associate clinical range for child B in pre- and post-observation.

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