

学位論文

「A study of disfluencies in people who do not stutter  
estimated using the Assessment of Stuttering」

(吃音検査法を用いた非吃音児者の非流暢性の分析)

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## 著者の宣言

本学位論文は、著者の責任において実験を遂行し、得られた真実の結果に基づいて正確に作成したものに相違ないことをここに宣言する。

# Abstract

**Objective:** The aim of the present study was to clarify the characteristics of disfluencies in people who do not stutter to obtain basic data for the evaluation of people who do stutter.

**Methods:** The Assessment of Stuttering was used to estimate the rate of disfluencies in 186 participants of different age groups of people who do not stutter during different task conditions including free conversation, picture explanation, monologue, and oral-passage reading. The results were then compared among the age groups and tasks.

**Results:** The rate of stuttering core behavior was equivalent to that reported in previous international studies abroad. The rate of total disfluency increased in the order of oral reading, free conversation, monologue, and picture explanation tasks. A significant correlation was found between the total disfluency rate of free conversation and both monologue and picture explanation, but the oral-passage reading task showed no significant correlations with any other tasks.

**Conclusion:** The rates of disfluencies obtained in the present study should be regarded a useful indicator for the evaluation of stuttering.

# 和文要旨

## 【背景と目的】

吃音児者の症状を的確に評価する事は、その後の指導の第一歩となる。海外では多くのデータ収集と分析の結果、一貫した評価が行われるようになってきている。本邦においても、それらの英語圏のデータを元に1981年に吃音検査法<試案1>が提案されたが、症状分類が多岐にわたる上、課題数も多く、評価に時間と熟練を要して普及には至らなかった。このため、吃音を扱う研究者や臨床家は、施設独自の方法を用いるなど一貫した意見交換を行うのに、支障をきたしていた。2013年に、症状表記の統合や課題数の削減を実施し、「吃音検査法」が改訂出版された。この検査法を用いて、非吃音児者の発話資料を収集し、日本語における非流暢性の出現の特徴について検討、吃音児者に対する評価の指標となる資料を得ることを目的とした。

## 【方法】

対象は、言語聴覚士や通級指導学級の言語の専門教員により、「吃音ではない」かつ、「知的発達・言語発達に問題がない」と判断された小学生・中学生・高校生・成人186名（男92名女94名）。10分程度の自由会話と、吃音検査法の「絵の説明課題」、「モノログ課題」（小4以上）、「文章音読課題」を実施し、発話サンプルはオーディオテープに記録した。録音した発話サンプルを全て書きおこし、吃音の臨床経験が20年以上の言語聴覚士3名が、吃音の中核症状（音・モーラの繰り返し、語の一部の繰り返し、引き伸ばし、ブロック）と、その他の非流暢性（語句の繰り返し、挿入、いい直し、中止、とぎれ、間）を同定した。症状の出現頻度を算出、ノンパラメトリックな統計手法を用いて、年代間、課題間により差が生じているか否かを検証した。

## 【結果】

- 1) 非吃音児者の吃音中核症状の頻度は、英語圏と同程度の平均、標準偏差を示した。
- 2) 総非流暢性頻度は、音読、自由会話、モノログ、絵の説明の順で増加した。
- 3) 年代別、課題別に総非流暢性頻度を検討すると、自由会話は小学生が高く、音読は低学年ほど高かった。状況絵説明やモノログは、高学年が中学生以上よりも高かった。
- 4) モノログ、絵の説明とも自由会話の総非流暢性頻度と高い相関がみられた。一方、音読はいずれの課題とも相関は低かった。

以上より、非吃音児者であっても、言語的に難しい課題であれば非流暢性が増加することが明らかとなり、年齢が上ると、非流暢性は軽減されていった。自由会話と各課題の相関の有無により、今後の課題選択に示唆を得られた。

## 【結論】

本研究により得られた非流暢性の頻度は、吃音児者の評価のための有用な指標となると考える。

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## 1. Introduction

Accurately evaluating stuttering symptoms in both children and adults who stutter is the first step in the treatment of stuttering. Around the time of “Diagnosogenic theory”<sup>1</sup> researchers collected speech samples from a large number of children, and attempted the categorization and development of indicators for evaluating people who stutter (PWS).<sup>2-6</sup>

Two global disfluency measures were introduced<sup>7-10</sup>: Stuttering-like disfluencies (SLD) and Other disfluencies (OD). SLD, unique to PWS, included 4 types: partial word repetition, monosyllabic word repetition, prolongation of sound, and arrest of speech (blocks). To distinguish PWS from people who do not stutter (PWNS), one of the benchmarks commonly used is “3 stutters per 100 words or 100 syllables.”<sup>8-10</sup>

Similarly, the Stuttering Severity Index (SSI)<sup>11</sup> was developed to measure the effect of the treatment of stuttering in 1972. It has been continually modified, and the SSI-3,<sup>12</sup> developed in 1994, has been used in many countries including the United States, as a compulsory assessment in determining the individual adaptation of support programs. This assessment consists of combined percent syllables stuttered, duration of the three longest stuttering events, and rating of physical concomitants. Speech samples are collected in free conversational settings and reading aloud. If reading aloud is not possible, participants are asked to explain some pictures.

In Japan, the Assessment of Stuttering “Proposal 1”<sup>13</sup> developed in 1981 was the first standard method to evaluate stuttering. Proposal 1 drew on the stuttering behavior categories of earlier studies<sup>13</sup> and was created with the hope of accurately notating all types of disfluencies. It, therefore, included all 16 symptom categories, and the notation was complex and required tester’s training. Furthermore, as there were a large number of tasks involved and the assessment and the analysis tended to take a long time, and because of difficulties in identifying marketing outlets, the assessment was not widely used. Some researchers employed Proposal 1,<sup>14-21</sup> and they made efforts to integrate and simplify the symptom notation and reduce the number of tasks involved. As a result, a revised version, known as the Assessment of Stuttering, was published in

2013.<sup>22</sup>

The present study aimed at clarifying the characteristics of disfluencies in PWNS to obtain the basic data for the evaluation of PWS. For this, we employed the Assessment of Stuttering<sup>22</sup> to analyze the data obtained from different age groups of primary, junior high, and senior high school-age children and adults with reference to different assessment tasks.

## **2.Methods**

### **2-1 Participants**

The participants of the present study consisted of 186 normally developed children and adults, with no complaints of stuttering from themselves or their parents or guardians. The participants had been clinically identified by speech resource room teachers or speech therapists at hospitals and other facilities as having no stuttering or other issues during their intellectual or speech development. The ages and genders of the participants are shown in Table 1. This study was carried out in accordance with the Declaration of Helsinki and approved by the ethics committee of Kitasato University Hospital (C 05-218). Before starting sample recordings, the purpose and details of the present study were verbally explained to the participants, and written consent was obtained from themselves or their parents or guardians.

### **2-2 Procedures**

#### **2-2-1 Assessors**

Assessments were conducted by a number of speech resource room teachers and speech therapists from hospitals or other facilities, who either had experience with the Assessment of Stuttering “Proposal 1”<sup>13</sup> or had volunteered to participate in this study after receiving sufficient explanations of the Assessment of Stuttering.<sup>22</sup>

#### **2-2-2 Assessment contents and the recording method**

Assessments consisted of approximately 10 minutes of free conversation, a picture explanation task, a monologue task, and/or an oral passage-reading task (oral reading), as set out in the Assessment of Stuttering.<sup>22</sup> The picture explanation task required participants to explain 4–5

sequential pictures, along with pictures of scenery, such as the seaside or a living room. For primary school children in grades 4 and above, the monologue task administered involved asking the participant to speak freely about something like playing after school or club activities as though they were talking to themselves. The assessor listened without asking questions or making other interruptions. In the oral reading assessment, participants were asked to read Japanese sentences consisting of 50 bunsetsus matched to the participant's education level, in which a bunsetsu is a linguistic unit of Japanese comprised of a content word with or without being followed by a function word. Namely, primary school-age children in grades 1–3 (lower grades) were asked to read the story, "The Elephant and the Rainbow." For those in grades 4–6 (higher grades) "Jack and the Beanstalk" was used, while for those in junior high school and above, "Humans and Nature" was used as the reading text. All the speech samples were recorded.

### **2-2-3. Evaluation method**

All the recorded speech samples were transcribed in the form of bunsetsu strings, and 3 speech therapists, each of whom having at least 20 years clinical experience with stuttering patients, evaluated the manifestation of disfluency. The patterns of disfluency manifestation were divided into "stuttering core behavior" and "other disfluencies." "Stuttering core behavior" is unique to PWS, consisting of 4 categories of disfluencies: sound, mora, and syllable repetition; partial-word repetition; prolongation; and blocks. "Other disfluencies" are exhibited by PWNS, consisting of 6 categories of disfluencies: word and phrase repetition, interjection, revision, incompleteness, breaks, and pauses.<sup>22</sup> Thus, a total of 10 categories were adopted as disfluency manifestations in the present study, and evaluations were made to describe the presence of disfluencies in the transcribed materials.

The rate of agreement in the evaluation scores between repeated evaluations in each evaluator, and that among the 3 evaluators were tested using the Sander Agreement Index.<sup>23</sup> The agreement rate between evaluations and re-evaluations made by the same evaluator more than 1 month



apart was 94%, while the rate among the 3 evaluators was 89%. According to the literature, the minimum level for acceptable agreement is 80%.<sup>24</sup>

### **2-3. Data analyses**

#### **2-3-1. Calculating the rates of stuttering core behavior and those of total disfluency**

Two categories of disfluency rates were obtained: the rate of stuttering core behavior and the total disfluency rate (Figure 1). The rate of stuttering core behavior refers to the number of stuttering core behaviors exhibited per 100 bunsetsus of speech, while the total disfluency rate refers to the total number of disfluency manifestations as a sum of both stuttering core behaviors and other disfluencies per 100 bunsetsus. If speech samples in the task were less than 50 bunsetsus those were excluded from the analysis (Table 2).

#### **2-3-2. Statistical analyses**

Non-parametric statistical methods were used to compare the rates of total dysfluencies among the different age groups and among the different test conditions including free conversation, picture explanation, monologue, and oral reading. Correlation analyses were also done to test to determine whether or not there were significant relationships in the rates of total disfluencies between free conversation and the other speech tasks. The analyses were conducted using SPSS Statistics, version 22. Values of  $P < 0.005$  were considered to indicate statistical significance.

### **3. Results**

#### **3-1. The average rate of stuttering core behavior**

Across the different age groups, the average rate of stuttering core behavior was less than 2 in 100 bunsetsus for free conversation and all the tasks. If the range of one standard deviation (the average + 1 SD) was taken into consideration, the values in different test conditions were: free conversation, 3.03; picture explanation, 3.96; monologue, 3.84; and oral reading, 3.14.

#### **3-2. Disfluency rates in free conversation and the other speech tasks**

The rates of stuttering core behavior in different age groups for free conversation and the other

speech tasks are presented in Table 3, while the rates of total disfluency in different age groups are shown in Table 4. The average rates of stuttering core behavior were relatively low, ranging from 0.99 (for the passage reading task) to 1.89 (picture explanation task), although the entire range was broad, from 0 to 20 (passage reading task, grade 1). The average rates of total disfluency ranged from 4.7 (passage reading task) to 16.3 (picture explanation task), with a wide range from 0 to 45 (oral reading task, grade 1) depending on the difference in tasks and age groups.

The statistical analyses using the Friedman test revealed that to be a main effect of task type to a significance level of 1% ( $\chi^2 = 138.214$ ,  $n = 136$ ,  $P < 0.0001$ ) among all participants. Multiple comparisons showed a significant difference between each of the different task types: free conversation vs. picture explanation ( $\chi^2 = 44.514$ , degrees of freedom [d.f.] = 2,  $P < 0.0001$ ); free conversation vs. oral reading ( $\chi^2 = 96.672$ , d.f. = 2,  $P < 0.0001$ ); and picture explanation vs. oral reading ( $\chi^2 = 272.384$ , d.f. = 2,  $P < 0.0001$ ). The disfluency rate increased significantly from oral reading to free conversation to picture explanation.

Regarding the monologue task conducted with participants from grade 4 and above, a main effect related to the task type was found ( $\chi^2 = 110.217$ ,  $n = 72$ ,  $P < 0.0001$ ), and multiple comparisons revealed a significant difference among each of the different task types: picture explanation ( $\chi^2 = 8.921$ , d.f. = 3,  $P = 0.025$ ), free conversation ( $\chi^2 = 30.131$ , d.f. = 3,  $P < 0.0001$ ), and oral reading ( $\chi^2 = 195.02$ , d.f. = 3,  $P < 0.0001$ ).

### **3-3 Differences in total disfluency rates among different age groups**

The Kruskal-Wallis test revealed that there was a main effect between the age groups for free conversation and each of the speech tasks ( $P < 0.001$ ) (Table 5). Multiple comparisons using Scheffé's method showed that the significance was higher in primary school-age participants than that in the adolescent and adult group for free conversation and the picture explanation task ( $P < 0.001$ ).

Regarding the monologue task, the Mann-Whitney U test revealed a higher level of significance in primary school-age children than in the adolescent and adult group ( $P < 0.001$ ).

### **3-4. Relationship between free conversation and speech activities**

The Pearson product-moment correlation coefficient revealed a highly significant positive correlation in the total disfluency rate between free conversation and the monologue task ( $r = 0.757$ ,  $P < 0.001$ ) (Figure 2). Significant correlations were also found between free conversation and the picture explanation task ( $r = 0.462$ ,  $P < 0.001$ ) (Figure 3) and the picture explanation and monologue tasks ( $r = 0.598$ ,  $P < 0.001$ ) (Figure 4). However, no significant correlation was found between free conversation and the oral reading task ( $r = 0.115$ , n.s.) (Figure 5).

## **4. Discussion**

### **4-1. Normal disfluency range and diagnosis threshold**

In English-speaking countries, less than 3% of disfluencies (less than 3 stuttering-like symptoms in 100 syllables) is regarded as the normal range of disfluency.<sup>8-10</sup> Although there are definite linguistic differences between English and Japanese, in the present study, the average rate of stuttering core behavior across the different age groups was approximately 3 including the range of one standard deviation per 100 bunsetsus for free conversation, while the average rates were 3–4 for the other speech tasks examined. According to the range of all the data, consideration must be given to not only frequency but also other manifestations of disfluency, such as tension, times of repetition, and lengths of blocks, to diagnose stuttering more accurately.

### **4-2. Differences in total disfluency rates among different age groups**

In all of the tasks, including free conversation, the main effect of age was found in the total disfluency rate. Particularly, the disfluency rate was higher for the oral reading task in lower-grade participants than that in higher age groups, although there was a possibility that immature reading and text-to-sound conversion abilities of participants affected the results.

In the monologue task, primary school-age participants showed a significantly higher rate of total disfluency than did those of junior high school age and above. Grade-4 primary school students, especially, exhibited a low level of achievement with a high total disfluency rate in this task. The task, “Talk freely about a topic of your choice like playing after school or club activities as though you were talking to yourself” was considered too difficult for participants in grade 4. The effects of linguistic factors on disfluency have been identified by a number of scholars,<sup>25-30</sup> and, in the present study, we suggested the possibility that, depending on the situation or setting, the rate of disfluency could be high, even for participants thought not to have difficulty in regular, routine, daily conversations.

#### **4-3. The relationship among free conversation and the other speech tasks**

Evaluation of stuttering is often carried out in free conversation. In fact, the frequency of stuttering has been found to vary greatly depending on conditions. So we analyze the relationships among the speech tasks and free conversation in order to obtain the basic data. The total disfluency rates increased in the order of oral reading, free conversation, monologue, and picture explanation. A highly significant correlation was found between free conversation and the monologue task in PWNS. If we consider that differences in stuttering may arise depending on the content of the conversation and responses of the listener, we can see the benefit of using the monologue task, where participants are asked to speak on their own. However, when attempting to compare intra- and inter-individual differences in the monologue task, we should realize that the rate of disfluencies was slightly higher than that in free conversation. The findings were evident in participants of junior high school age and above, where total disfluency rates were approximately 10% and the standard deviation was low. Moreover, as a significant correlation existed between free conversation and the picture explanation task, the picture explanation task may be more useful for the detection of disfluencies than the monologue task for children in primary school.

However, the total disfluency rate was low for the oral-reading task, and no significant

correlations were found between it and any other tasks. Converting text to sounds seems to give less linguistic burden than other tasks, which require participants to create spoken contents as they speak spontaneously. It is likely that the difference affected the total disfluency rate. However, PWS are known to have a tendency to be nervous about their own difficulties in reading aloud and might exhibit different results from PWNS. Future studies on PWS data collection will be necessary for comparisons.

## **5. Conclusion**

Based on this study using the Assessment of Stuttering<sup>22</sup> to compare the speech samples obtained from 186 PWNS participants, the following conclusions were made. 1. Stuttering core behavior frequency was similar to that found in previous studies abroad. 2. The total disfluency rates increased in the order of oral reading, free conversation, monologue, and picture explanation. 3. Significant correlations were found between the total disfluency rates of free conversation and both monologue and picture explanation tasks. On the other hand, there were no significant correlations between the total disfluency rates in the oral reading task and the other tasks. Future studies on the data collected from PWS are warranted for further and more comprehensive comparative analyses.

## **6. Future Tasks**

Future studies on the data collected from PWS are necessary for further comparative analyses. And I have to compare the calculating for the rate system between using bunsetsus and mora. The Assessment of Stuttering included emotional reaction like avoidance. But the target of this Assessment is only observable behavior. We have to get the information from self-evaluation system like questionnaire.

## **7. Acknowledgements**

The authors thank all the participants in the present study and all the speech resource room teachers and speech therapists who assisted the assessment data collection. We also thank Dr. Hajime Hirose, Professor Emeritus, University of Tokyo, for his advice in preparing the manuscript, and Professor Makihiko Suzuki, of the Department of Liberal Arts and Sciences, for advice with the statistical analyses.

This work was supported by the Grant in Aid for Scientific Research No. H14- Kokoro-001.

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## **9. Figures & Tables**

**Figure 1.** Calculation of the rates of disfluencies

**Figure 2.** The relationship of total disfluency rates between monologue and free conversation

**Figure 3.** The relationship of total disfluency rates between picture explanation and free conversation

**Figure4.** The relationship of total disfluency rates between monologue and picture explanation

**Figure 5.** The relationship of total disfluency rates between oral reading and free conversation

**Table 1** Participants

**Table2** Rate of Achievement (gained more than 50 bunsetsus)

**Table3** Rate of stuttering core behavior

**Table 4** Rate of total disfluency

**Table 5.** Differences in rates of total dysfluencies among different age groups

Rate of Stuttering Core Behavior	=	$\frac{\text{Numbers of stuttering core behaviors}}{\text{Numbers of total bunsetsus}}$	$\times 100$
Rate of Total Disfluency	=	$\frac{\text{Numbers of ( SCB + OD )}}{\text{Numbers of total bunsetsus}}$	$\times 100$
SCB= stuttering core behavior, OD= other disfluencies			

**Figure 1. Calculation of the rates of disfluencies**

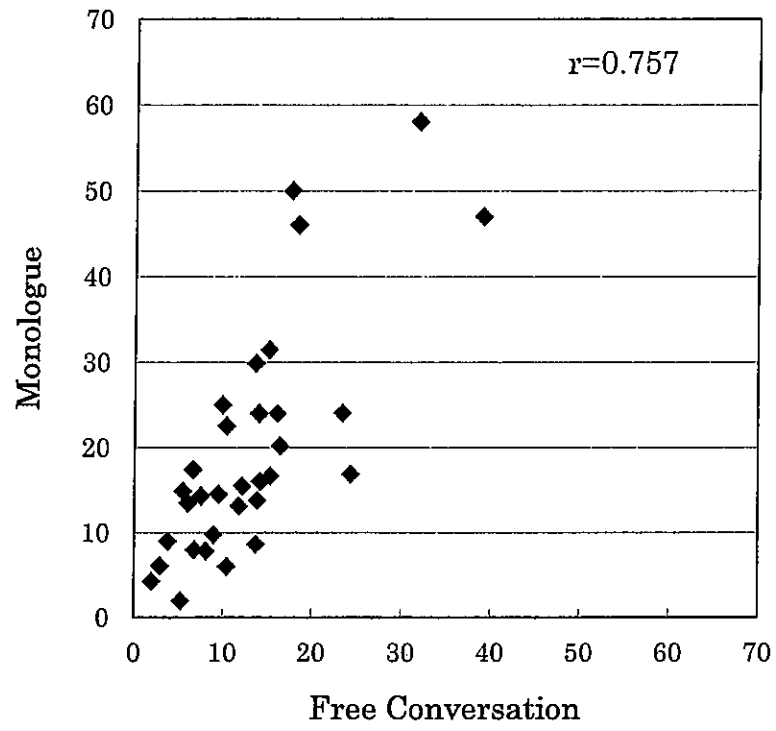


Fig.2 The relationship of total disfluency rate between Monologue and Free Conversation

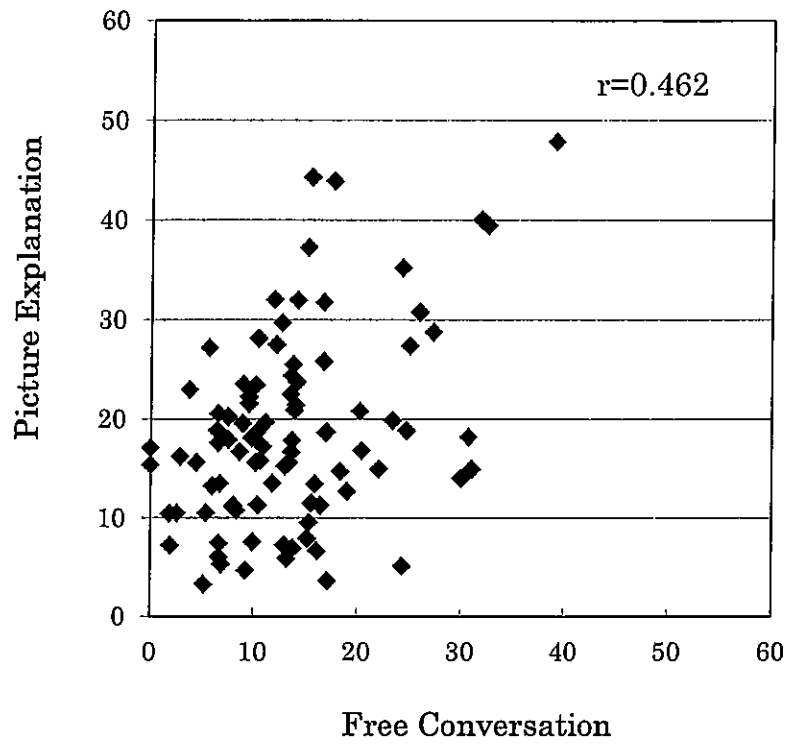


Fig.3 The relationship of total disfluency rate between Picture Explanation and Free Conversation

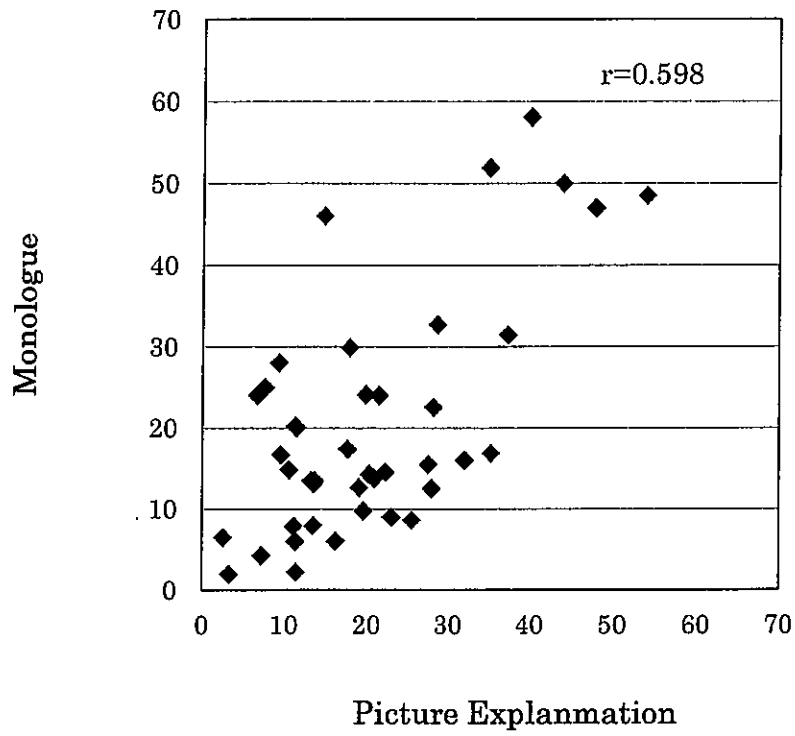


Fig.4 The relationship of total disfluency rate between Monologue and Picture Explanation

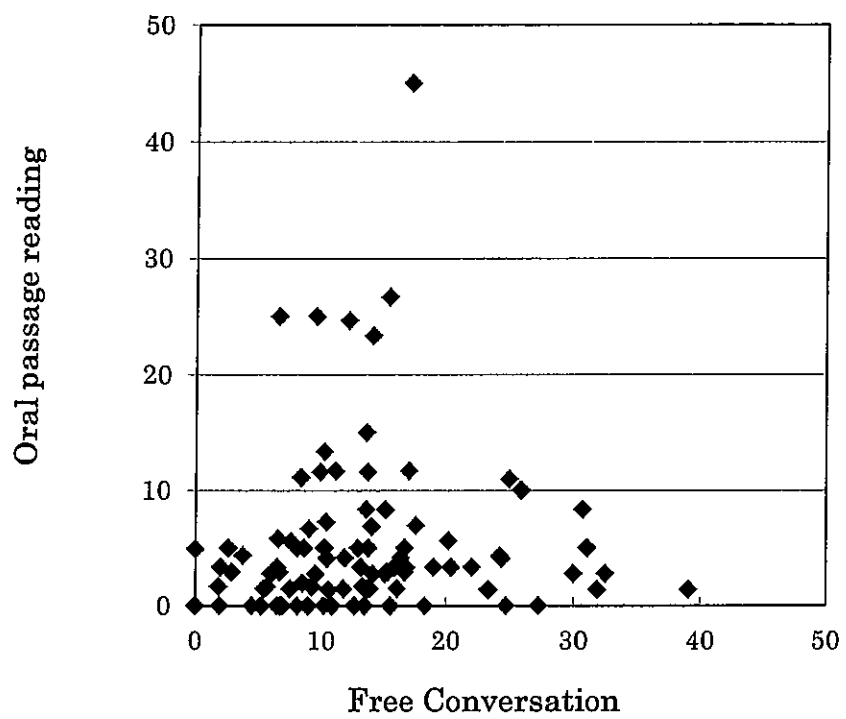


Fig.5 The relationship of total disfluency rate between Oral Passage reading and Free Conversation

Table 1 Participants

Gender	Lower grades			Higher grades			Adolescence		Adult	Total
	1st grade	2nd grade	3rd grade	4th grade	5th grade	6th grade	junior high school	Senior high school	adult	
Male	10	10	10	10	10	13	10	10	9	92
Female	10	9	11	12	11	10	10	10	11	94
Total	20	19	21	22	21	23	20	20	20	186

Table2 Rate of Achievement (gained more than 50 bunsetsus)

Level	Free conversation	Picture explanation	Monologue	Oral passage reading
Primary school	73%	94%	52%	96%
Junior high school	45%	100%	70%	100%
Senior high school	85%	100%	80%	100%
Adult	100%	100%	90%	100%
Average	74%	96%	71%	97%



**Table3 Rate of stuttering core behavior**

Mean  $\pm$ SD (Min - Max)

	Free conversation	Picture explanation	Monologue	Oral-passage reading
1st grade	1.35 $\pm$ 1.54 (0.0-5.0)	2.11 $\pm$ 1.79 (0.0- 6.1)		3.15 $\pm$ 5.20 (0.0-20.0)
2nd grade	0.68 $\pm$ 1.00 (0.0-3.0)	2.28 $\pm$ 1.75 (0.0- 5.8)		1.11 $\pm$ 1.80 (0.0- 5.8)
3rd grade	1.77 $\pm$ 2.42 (0.0-7.7)	2.24 $\pm$ 2.84 (0.0-11.4)		1.27 $\pm$ 2.17 (0.0- 6.7)
4th grade	2.74 $\pm$ 1.99 (0.0-7.1)	2.69 $\pm$ 2.31 (0.0- 8.3)	3.25 $\pm$ 3.26 (0.0-10.1)	0.63 $\pm$ 1.47 (0.0- 5.5)
5th grade	0.90 $\pm$ 1.33 (0.0-4.0)	2.19 $\pm$ 1.98 (0.0- 6.6)	1.04 $\pm$ 0.97 (0.0- 2.9)	0.75 $\pm$ 1.41 (0.0- 4.3)
6th grade	1.31 $\pm$ 1.87 (0.0-6.3)	2.33 $\pm$ 2.58 (0.0-10.7)	1.60 $\pm$ 1.43 (0.0- 4.8)	0.42 $\pm$ 0.77 (0.0- 2.7)
Junior high school	0.74 $\pm$ 1.32 (0.0-3.8)	1.36 $\pm$ 1.54 (0.0- 5.7)	1.81 $\pm$ 4.63 (0.0-17.7)	1.42 $\pm$ 1.61 (0.0- 3.8)
Senior high school	0.42 $\pm$ 0.70 (0.0-2.0)	0.70 $\pm$ 1.32 (0.0- 4.4)	1.09 $\pm$ 1.66 (0.0- 5.8)	0.28 $\pm$ 0.69 (0.0- 1.9)
adult	1.05 $\pm$ 1.48 (0.0-5.0)	1.03 $\pm$ 0.98 (0.0- 3.1)	0.82 $\pm$ 1.13 (0.0- 4.4)	0.47 $\pm$ 0.84 (0.0- 1.9)
<b>Total</b>	<b>1.28 <math>\pm</math> 1.75 (0.0-7.7)</b>	<b>1.89 <math>\pm</math> 2.07 (0.0-11.4)</b>	<b>1.42 <math>\pm</math> 2.38 (0.0-17.7)</b>	<b>0.99 <math>\pm</math> 2.15 (0.0-20.0)</b>

Table 4 Rate of total disfluency

Mean  $\pm$ SD (Min - Max)

	Free conversation	Picture explanation	Monologue	Oral- passage reading
1st grade	12.6 $\pm$ 7.18 (2.0-31.0)	14.5 $\pm$ 8.64 (1.6-28.3)		11.5 $\pm$ 11.33 (0.0-45.0)
2nd grade	8.9 $\pm$ 6.84 (0.0-24.8)	16.1 $\pm$ 7.21 (4.7-31.8)		6.2 $\pm$ 5.94 (0.0-25.0)
3rd grade	14.0 $\pm$ 6.85 (1.9-30.7)	16.6 $\pm$ 8.76 (5.3-44.3)		5.8 $\pm$ 6.04 (0.0-26.7)
4th grade	17.3 $\pm$ 9.75 (1.9-32.5)	21.5 $\pm$ 12.06 (3.3-43.9)	27.7 $\pm$ 22.45 (1.9-58.1)	3.1 $\pm$ 2.95 (0.0-11.0)
5th grade	9.6 $\pm$ 3.88 (2.9-15.1)	21.4 $\pm$ 10.44 (7.6-54.0)	18.1 $\pm$ 10.38 (6.1-48.5)	4.7 $\pm$ 5.58 (0.0-24.6)
6th grade	15.1 $\pm$ 8.63 (4.5-39.1)	18.6 $\pm$ 12.19 (2.5-47.9)	19.5 $\pm$ 13.57 (2.2-47.0)	2.1 $\pm$ 2.28 (0.0- 6.9)
Junior high school	5.9 $\pm$ 4.42 (1.5-11.6)	11.4 $\pm$ 5.68 (1.5-21.3)	10.9 $\pm$ 7.98 (0.8-31.3)	6.7 $\pm$ 4.64 (0.0-15.1)
Senior high school	8.3 $\pm$ 4.21 (2.9-19.8)	13.3 $\pm$ 8.98 (3.9-32.9)	12.8 $\pm$ 7.31 (0.2-29.8)	2.1 $\pm$ 2.07 (0.0- 7.6)
adult	7.8 $\pm$ 5.12 (1.0-18.8)	11.3 $\pm$ 6.43 (1.4-26.3)	9.6 $\pm$ 5.06 (0.0-17.5)	2.2 $\pm$ 2.69 (0.0- 7.6)
Total	11.4 $\pm$ 7.45 (0.0-39.1)	16.3 $\pm$ 9.69 (1.4-54.0)	15.4 $\pm$ 11.99 (0.0-58.1)	4.7 $\pm$ 5.85 (0.0-45.0)

**Table 5. Differences in rates of total dysfluencies among different age groups**

( $\chi^2$  values)

	Lower grade Vs. Higher grade	Lower grade Vs. Adolescence and adult group	Higher grade Vs. Adolescence and adult group,
Free conversation		*	*
Picture explanation			*
Oral passage reading	*		
Monologue			*

\*P<0.001 used Scheffé's method and Mann-Whitney U test

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