

## The Affecting Factor on the Children's Playfulness in South Korea

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### Abstract

*This study is the investigate relationship between playfulness and sensory processing among children. We carries out questoinnaire survey to children about characteristics, sensory processing and playfulness. Male is higher than female as age in playfulness. There are relationship between sensory processing and playfulness. This study provide basic data in play type and activities for children.*

**Keywords:** *Children, Playfulness, Sensory processing*

### 1. Introduction

Children can think, feel, regret or create something by playing, and an activity that children truly likes and enjoys can be called as a play [1]. Child's playfulness can be defined as the quality and style of the play which child expresses on the play, and can be classified as distinctive words such as physical spontaneity, social spontaneity, ognitive spontaneity, expression of joy and sense of humor [2].

Children's favorable play, play type and play tendency are different depending on gender, so girls like cutting, pasting and other art activities, while boys interest more in playing with toy car or blocks [3]. However, the difference in playfulness by gender is lacking its consistency [4, 5].

By those several plays, a child contacts with the surrounding world, learns child oneself, others and the world, and achieves physical, social and cognitive development. With this play activity, children improve their sensory integration ability, physical ability, cognitive skill, language skill and human relationship, as well as fulfill their proper roles and duties in order to meet their roles as a member of society [7]. Moreover, they improve interaction ability and personal relationship ability within a peer group by various sensory inputs, and ultimately increase social and cognitive ability [8].

Sensory process is a series of process that a brain systemizes or integrates to utilize sensory information from the body or outer environment [9]. This process is operated unconsciously, and a behavioral response which is experienced within the range of purposive standard [10]. In addition, sensory process is a process in order to adjust to environment and situation by providing sensory information to the brain [11], an ability to control and systemize responses in a proper and staged method, and a process of the central nerves which is related to inflow and outflow of sensory input from diverse backgrounds [12]. Sense of touch, proprioceptive sense and vestibular sense are main factors of sensory integration, and this sensory integration is regarded as the basis of behaviors which are related to personal management, self-management, learning and play [13]. During the development of childhood, sensory process has an influence on playfulness of peer relationships [14]. Interaction through a play activity

is effective to stimulate integrated education, and has a mutual relationship with sensory functions [15].

However, if there is an abnormality in a sensory system, people cannot order or simplify nearby world since they cannot distinguish general elements between objects and systemize the experience [16]. If there is an obstacle in sensory control, people might underreact or overreact to the sensory input from the body or outside, therefore show an adjust response or cannot control or systemize [9]. Because of this, there is disharmony in individual's inner and outer world, and a maladjusted response to the sensory input limits participation in home, school and play activity, therefore has a negative impact on person's quality of life [17,18, 19].

As you can see above, boys showed high points in playfulness than girls in many of previous researches on playfulness, but recent researches revealed that there was not much difference in playfulness, and girls acquired more points than boys in sub factor analysis [14].

There were lots of researches on treatment effects of sensory integrative therapy to developmentally disabled child or comparison of sensory process on regular child and handicapped child [20] recently, but there were not enough researches on general child's sensory process and playfulness.

The main objective of this research is to find out the difference in playfulness and sensory process which is based on gender and age, and to investigate the correlation between playfulness and sensory process.

## **2. Research Method**

### **2.1. Research Subjects and Period**

We investigated test subject's general characteristics, family members, favorable family member, favorable play, and a person who usually plays with. The research period was from June 1<sup>st</sup> 2012 until July 30<sup>th</sup> 2012, and we distributed questionnaires to parents from 6 kindergartens with proper explanation of this survey. 150 questionnaires were distributed, and with exclusion of surveys that had unfaithful answer and errors, 128 questionnaires (85%) were finally analyzed.

### **2.2. Evaluation Tool**

#### **2.2.1. Short Sensory Profile**

It was firstly developed by Dunn [21], and it was edited by McIntosh, Miller and Shyu [12] to sort children who have difficulty in sensory process, and finally adapted and modified by Kim, Misun [22]. It is composed of 7 parts which are related to daily life's sensory process of the child, and each section is composed of 7 questions on tactile sensitivity, 4 questions on taste/smell sensitivity, 3 questions on movement sensitivity, 7 questions on under responsive/seek sensation, 6 questions on auditory filtering, 6 questions on low energy/weak and 5 question on visual/auditory sensitivity, which sums up as 38 questions. Internal validity correlations of SSP was .25~.76, and  $p < 0.01$ . The Cronbach'  $\alpha$  value of this research is on [Table 1].

**Table 1. Sub-areas and Reliability of Sensory Processing**

Sub-area	Number	Cronbach's $\alpha$
Tactile sensitivity	7	.849
Taste/smell sensitivity	4	.894
Movement sensitivity	3	.826
Underresponsive /seeks Sensation	7	.806
Auditory filtering	6	.883
Low energy/weak	6	.901
Visual/auditory sensitivity	5	.882
Total score	38	.948

### 2.2.2. Playfulness Criteria (For Parents)

We will use a tool of Barnett's Children's Playfulness Scale, which was adapted by Yoo, Aeyeol [4] and was edited into for parents by Kim, Misuk [24]. The criteria on these questions are in Likert's 5-point scale, from 1 point of 'Not at all' to 5 point of 'Very likely so'. Therefore, if the score is high, that means that the tendency of that factor is also high. The Cronbach'  $\alpha$  value of this research is on [Table 2].

**Table 2. Sub-areas and Reliability of Playfulness**

Sub-area	Number	Cronbach's $\alpha$
Physical spontaneity	4	.879
Social spontaneity	5	.817
Cognitive spontaneity	4	.851
Joy expression	5	.871
Sense of humor	5	.825
Total score	23	.935

### 2.3. Analysis Method

We used Window SPSS 18.0 for analysis. We also performed a frequency analysis on test subject's general characteristics and age. In order to identify the difference of sensory process and playfulness based on age and gender, the independent t-test and one-way analysis of variance were implemented. For post-verification, Scheffe's method was used to find out the difference between groups. For a correlation between playfulness and sensory process, Pearson correlation analysis was used. The significance level was set to  $p < 0.05$ .

## 3. Research Results

### 3.1. Characteristics of Research Subjects

46.10% of research subjects were girls, and average age was  $6.22 \pm 1.26$ . In family members section, most of research subjects had father (97.7%) and mother (99.2%), as well as other

members such as grandfather (10.9%), grandmother (15.6%), elder brother (23.4%), elder sister (15.6%) and younger brother/sister (36.7%). Favorable family member was in this order: mother (59.4%), father (21.9%), younger brother/sister (7.0%), elder sister (6.3%), grandmother (4.7%), elder brother (2.3%) and grandfather (0%). The duration of stay was more than 2 years (50.0%), more than 3 years (26.6%), more than 1 year (17.2%), less than 1 year (5.5%) and more than 4 years (0.8%). [Table 3].

**Table 3. General Characteristics of the Study Subjects (N=128)**

Characteristics		Freq.	%
Sex	Male	69	53.9
	Female	59	46.1
Age	Mean±SD	6.22±1.26	
Family(duplication)	Father	125	97.7
	Mother	127	99.2
	Grandfather	14	10.9
	Grandmother	20	15.6
	Brother(Elder)	30	23.4
	Sister(Elder)	20	15.6
	Yonger	47	36.7
Favorite Family(duplication)	Father	28	21.9
	Mother	76	59.4
	Grandfather	0	0
	Grandmother	6	4.7
	Brother(Elder)	3	2.3
	Sister(Elder)	8	6.3
	Yonger	9	7.0
Duration of inpatient	under 1 year	7	5.5
	more than 1 year	22	17.2
	more than 2 year	64	50.0
	more than 3 year	34	26.6
	more than 4 year	1	.8

### 3.2. Comparison of Children's Sensory Process based on Gender

There was no difference in total points, but girls had higher points in sub-articles' over and under response, and it was statistically significant ( $p < 0.05$ ) [Table 4].

**Table 4. Sensory Processing and Playfulness According to Sex (N=128)**

	Mean ± SD		t
	Male(N=69)	Female(N=58)	
Tactile	4.31±0.67	4.45±0.60	-1.22
Taste/Smell	4.22±0.93	4.39±0.76	-1.06
Motion	4.49±0.72	4.44±0.68	-.32
Over response	4.04±0.87	4.37±0.63	-2.41*
Under response	4.18±0.67	4.40±0.59	-1.92*
Filtering sense of hearing	4.13±0.72	4.25±0.69	-.99
Deficiency of energy	4.53±0.63	4.46±0.68	.55
Vision/Hearing	4.37±0.67	4.28±0.91	.61
Total	4.28±0.51	4.38±0.54	-1.03

\*P<0.05

### 3.3. Comparison of Sensory Process and Playfulness based on Age

There was difference in points of sensory process and playfulness, and it was statistically significant ( $p < 0.001$ ). The result of Scheffe's verification showed that for sensory process, from 40 month, 50 month, 60 month and 70 month group, 60 month and 80 month was same group, and the score of 60 month and 80 month was low. For playfulness, 40 month, 50 month and 70 month were in same group while 70 month, 60 month and 80 month were in another group. The value of 50 month and 70 month was high [Table 5].

**Table 5. Sensory Processing and Playfulness According to Age (N=128)**

Dependent variable	age	Mean±SD	F/p	Scheffe
Sensory processing	40	4.42±0.38	8.54***	4,5,7,6,8
	50	4.51±0.27		
	60	4.18±0.60		
	70	4.50±0.46		
	80	3.78±0.47		
Playfulness	40	4.26±0.50	6.48***	4,5,7,6,8
	50	4.37±0.40		
	60	3.67±0.58		
	70	3.88±0.61		
	80	3.68±0.47		

### 3.4. Comparison of Children's Playfulness based on Gender

There was no difference in total points, but boys had higher points in sub-articles' physical spontaneity, and it was statistically significant ( $p < 0.05$  [Table 6]).

**Table 6. Child's Playfulness According to Sex**

	Mean ± SD		t
	Male(N=69)	Female(N=58)	
Physical spontaneousness	4.30±0.79	4.01±0.75	2.07*
Social spontaneousness	3.81±0.80	3.76±0.64	.36
Cognitive sensitiveness	3.68±0.72	3.70±0.75	-.16
Expression of joy	4.15±0.72	4.27±0.71	-.93
Humor	3.81±0.71	3.73±0.82	.57
Total	3.94±0.62	3.90±0.58	.44

\*P<0.05

**3.5. Correlation between Sensory Process and Playfulness**

The result of Pearson correlation analysis in order to identify the correlation between child's sensory process and playfulness is on [Table 7]. In total points of sensory process and playfulness, it showed a significant static correlation where the correlation coefficient was  $r=.26^{**}$ . If you check the relationship between sensory process and sub-variables of playfulness, the result showed physical spontaneity  $r=.28^{**}$ , social spontaneity  $r=.36^{**}$ , cognitive spontaneity  $r=.31^{**}$ , expression of joy  $r=.18^{*}$  and sense of humor  $r=-.03$ . If you check the relationship between playfulness and sub-variables of sensory process, the result showed tactile sensitivity  $r=.14$ , taste/smell sensitivity  $r=.20^{*}$ , movement sensitivity  $r=.27^{**}$ , over responsive/seek sensation  $r=.03$ , under responsive/seek sensation  $r=.19^{*}$ , auditory filtering  $r=.19^{*}$ , low energy/weak  $r=.32^{**}$ , and visual/auditory sensitivity  $r=.12$  [Table 7].

**Table 7. Correlation between Sensory Processing and Playfulness**

	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
a	1														
b	.64**	1													
c	.45**	.66**	1												
d	.54**	.62**	.51**	1											
e	.46**	.50**	.48**	.60**	1										
f	.76**	.85**	.76**	.82**	.77**	1									
g	.11	.25**	.21*	.08	-.04	.15	1								
h	.20*	.25**	.29**	.07	.01	.20*	.56**	1							
i	.29**	.26**	.26**	.22**	.09	.28**	.51**	.39**	1						
j	.01	.17*	.17	.00	-.17*	.03	.43**	.31**	.27**	1					
k	.27	.45**	.44**	.34	.11	.40*	.56**	.47**	.45**	.46**	1				
l	.27**	.27**	.23**	.09	-.06	.19*	.45**	.27**	.32**	.54**	.54**	1			
m	.38**	.38**	.24**	.22*	.06	.31**	.43**	.40**	.50**	.37**	.53**	.53**	1		
n	.19*	.18*	.14	.13	-.10	.13	.52**	.29**	.52**	.47**	.42**	.53**	.61**	1	
o	.29**	.37**	.32**	.18*	-.03	.27**	.78**	.63**	.64**	.67**	.73**	.74**	.76**	.77**	1

(a=Physical spontaneousness, b=Social spontaneousness, c=Cognitive sensitiveness, d=Expression of joy, e=Humor, f=Total of Playfulness, g=Tactile, h=Taste/Smell, i=Motion, j=Over response, k=Under response, l=Filtering sense of hearing, m=Deficiency of energy, n=Vision/Hearing, o=Total of sensory processing)

\*P<0.05, \*\*P<0.01

### 3.6. The affecting Factor on the Children's Playfulness

The result of multiple regression analysis in order to identify the affecting factor on the children's playfulness is on [Table 8]. As it shown in Table 8, the results of the regression analysis indicated to children's playfulness. The under response independent variable is significantly related to the children's playfulness (coefficient = 2.88, odds ratio=0.40, p-value=0.05).

**Table 8. The Affecting Factor on the Children's Playfulness (N=128)**

	Coefficient(B)	P-value	Odds ratio	95% C.I.
Intercept	51.23	0.00	-	32.24~70.21
Tactile	-0.39	0.29	-0.13	-1.09~0.33
Taste/Smell	0.08	0.84	0.02	-0.74~-0.90
Motion	1.03	0.13	0.16	-0.32~2.38
Over response	-0.79	0.08	-0.18	-1.68~0.10
Under response	2.88	0.00	0.40	1.28~4.49
Filtering sense of hearing	0.08	0.83	0.02	-0.65~0.80
Deficiency of energy	0.69	0.09	0.20	-0.12~1.49
Vision/Hearing	-0.39	0.35	-0.11	-1.21~0.43

R<sup>2</sup>=0.24

## 4. Consideration

The main objective of this research is to identify the difference between playfulness and sensory process which is based on gender and age, and to verify the correlation between playfulness and sensory process by a systemized survey.

46.10% of research subjects were girls, and average age was 6.22±1.26. In family members section, most of research subjects had father (97.7%) and mother (99.2%). Mother (59.4%) and father (21.9%) were top 2 favorable family member, and research subjects favored younger sister or brother than elder ones. The duration of stay was more than 2 years (50.0%), more than 3 years (26.6%), more than 1 year (17.2%), less than 1 year (5.5%) and more than 4 years (0.8%).

There was no difference in total points of children's sensory process, but girls had higher points in sub-articles' over and under response, and it was statistically significant (p<0.05). However, in the research of Gu, Hyojin and Gang, Namsik[20], and the research of Lee, Jiyeon [25], the value was not statistically important, which showed a difference with this research.

If we compare sensory process and playfulness according to age, there was difference in points of sensory process and playfulness, and it was statistically significant (p<0.001). The result of Scheffe's verification showed that age 8 had higher points than age 4, 5 and 7 in sensory process, and for playfulness, age 7 and 8 was ahead than age 4 and 5. However, Dunn and Westman, who made a sense profile for the first time suggested that there was no significant difference in sensory process by age in their first research [26]. If we compare the average total points and average sub-factor point for each age from Gu, Hyojin and Gang, Namsik's research [20], there was a significant difference in tactile sensitivity (F=3.796, p<.05) only.

On the playfulness section which is based on gender, boys showed higher points in physical spontaneity only (p<0.05). In the research of Park, Hwayoon, Ma, Jisun and Cheon,

Eunyeong [5], they tried to figure out the difference in playfulness and interactive peer play based on gender difference, and the result showed that most of playfulness was same, but only in sub-factor of sense of humor, boys took the lead over girls. Moreover, in interactive peer play, play interactive behavior and play severance behavior were shown equally in both gender but boys had higher point in physical activities such as interrupting a play. On the other hand, Kim, Yeonghee [27] conducted a research on types of playfulness which were based on gender from children of age 3 to age 5, and the result showed that boys had the type of active physical play most, while girls had the type of passive play most. Lee,kyongsil [28] proposed that there was a significant difference in children's playfulness by gender, and boys acquired higher score than girls in sections of physical spontaneity, cognitive spontaneity, expression of joy and sense of humor.

In the research of Park, Jeongok and Kim, Junhee[29], and Song, Minyeong [30], boys had higher score in physical spontaneity section only. Lim, Yeongok[31] announced that boys had higher values in physical spontaneity, sense of humor and total points than girls. In the observational research of child's imagination play and teacher's intervention, boys showed higher level in expression of joy and sense of humor [4]. If we compare previous reaches and our research, we can prove that boys have higher value in physical spontaneity than girls. The result of Pearson correlation analysis in order to identify the correlation between child's sensory process and playfulness is on [Table 7]. In total points of sensory process and playfulness, it showed a significant static correlation where the correlation coefficient was  $r=.26^{**}$ . In other words, if a child handles sensory process well, than this child also has high playfulness. If you check the relationship between sensory process and sub-variables of playfulness, the result showed physical spontaneity  $r=.28^{**}$ , social spontaneity  $r=.36^{**}$ , cognitive spontaneity  $r=.31^{**}$ , expression of joy  $r=.18^*$  and sense of humor  $r=-.03$ . This proves that there is a significant correlation between total points of sensory process and physical spontaneity, social spontaneity, cognitive spontaneity and expression of joy. If you check the relationship between playfulness and sub-variables of sensory process, the result showed tactile sensitivity  $r=.14$ , taste/smell sensitivity  $r=.20^*$ , movement sensitivity  $r=.27^{**}$ , over responsive/seek sensation  $r=.03$ , under responsive/seek sensation  $r=.19^*$ , auditory filtering  $r=.19^*$ , low energy/weak  $r=.32^{**}$ , and visual/auditory sensitivity  $r=.12$ .

A child who has a problem with sensory process is having difficulties in learning of new concepts or keeping proper level of attention, and cannot participate in play [34]. Moreover, if the arousal level is so low, it may have some impact on active movement or motive in participating a play. On the other hand, if the arousal level is too high, than this child might have problem with keeping concentration [33]. If the sense is provided by sensory stimulation, children do not get an opportunity to integrate sensory stimulation, so it has to be served with activities such as play [34]. Therefore, for children who experience hypersensitive or undersensitive, we have to make them to participate play activities by a program which normalizes sensory process.

The meaning of this research is that by the correlation of normal children's sensory process and playfulness, the basic information was collected to find out type of play which is based on sensory process and suitable play activities for each child.

## 5. Conclusion

In this research, there was a significant difference in sensory process and playfulness based on normal children's gender and age, and also a correlation between sensory process and playfulness. Therefore, the type and preference of play activity which is based on children's sensory process must be identified in future research.



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