

## **The development of 3-5-year-old-children's sense of humor and the relationships among children's temperament and parents' humor style in China**

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### **Abstract**

Sense of humor refers to stable personality characteristic or individual differences in a psychological variable. Using a combination of a questionnaire and an experimental research approach, this study focused on understanding young children's gender and age characteristic as factors in the development of their sense of humor and also explored the influence of child temperament and the humor style of children's parents on the children's sense of humor. Results of the study were used to provide a theoretical foundation for fostering the early development and cultivation of children's sense of humor. The research was conducted on 110 preschool children aged 3-5 years old in a northern city in China. Three experimental tasks of different difficulties were used to observe the tendencies of the children's reaction to humor sensory stimuli. Also, teachers completed a questionnaire using the children's temperament assessed by teachers and the children's sense of humor assessed by teachers, and parents completed the Humor Styles Questionnaire (HSQ). The results of the study revealed a significant difference by age in humor development. Humor developed in an uneven track; it first blossomed and then the speed declined and even fell back slightly. The age of four was a turning point for children's development of the sense of humor. There was no overall difference in gender for 3-5-year-old children's sense of humor; however, an interaction between gender and age was evident. Three to 5 years old, girls' sense of humor was higher in

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understanding of humor while boys did not reach that degree of understanding until age 5. There were close relationships among 3-5-year-old children's humor development, their temperament and their parents' humor styles. Children's age, temperament Reaction, Activity, Inhibition, and parents' Affiliative humor style partially predicted the development of preschool children's sense of humor.

**Key words:** Preschooler; Sense of Humor; Development; Age; Temperament; Parents' Humor Style; China

## **1. Introduction**

Sense of humor refers to stable personality characteristic or individual differences in psychological variables. One definition is that sense of humor refers to one's psychological reaction and behavioral expression during the process when an individual feels, understands, and appreciates funny stimuli, then uses or even creates humor. Sense of humor is based on the given stage of cognitive development with the combination of fantasies as its instrument and pleasure experience and spiritual compensation as its destination.

Children with a good sense of humor are more confident in social activities and their studies, and they can fully display their ability in learning and in personal communications. Researchers often tried to understand children's behavioral expressions and styles of humor sense in game situations (e.g., Martin, 1996; Ruch, 1998). Consequently, more and more scholars began to focus on the relationship among cognition, environment, personal characteristics, and the sense of humor and to study the issues of developing and cultivating children's sense of humor.

Factors influencing children's sense of humor are diverse for it has multi-dimensional structure as many scholars thought ever since the humor movements in the 1960s (e.g., Dowing, 1999; Martin, 1983; Sheldon, 1996; Liu Wen, Zou Li-Na, & Li Liang, 2009). Still, individuals show sense of humor changes as they grow from born to

older. Infants, toddlers, 2-year-old kid, 7-8-year-old child, etc. behave differently when it comes to humor (e.g., McGhee, 1999; Catherine, 2006; Bergen, 2006). Some researchers believe that individual personality differences make children of the same age express and understand humor in different ways, so do gender differences (Nezu, 1988; Lampert & Ervin-Tripp, 1996).

This study explored the developmental characteristic of 3-5-year-old children's sense of humor. The researchers observed preschoolers' sense of humor elicited by humor stimuli, and then compared the relationships among teachers' views of preschoolers' sense of humor and temperament and their parents' humor styles. What internal and external factors were involved and whether definite influential factors could predict the development of children's sense of humor were observed. This research began with observing preschoolers' sensory reactions to humor stimuli, Then by combining the study of an internal factor, temperament, with an external factor, parents' sense of humor, the relationship between preschoolers' sense of humor and their temperament and parents' sense of humor was explored.

## **2. Method**

### *2.1. Participants and procedure*

A sample of 110 young children (58male and 52 female), whose ages ranged from 3 to 5 years old were recruited. The sample consisted of 32 3-year-old children, 39 4-year-old children and 39 5-year-old children. All the children were from one kindergarten in China.

The research procedure was as follows: first, questionnaires were given to teachers and parents; second, experimenters were trained in data collection and experiment conducting procedures; and third, the experiment was conducted. The design of the experiment was: 3 (task)  $\times$  3 (age)  $\times$  2 (gender). The experiment consisted of three tasks.

## 2.2. Experimental tasks

Formal experiments included three tasks: cartoon appreciation, music impromptu show, and Chinese characters' game. The three tasks' difficulties increased subsequently. All tasks took 10 minutes, Task One (21/2 minutes), Task Two (5 minutes), and Task Three (21/2 minutes).

*Task One: cartoon appreciation.* In this task, the children watched a humorous cartoon and reacted according to the humorous stimuli. The researchers observed the participants' responses while the participants watched the cartoon. A portion of the classic cartoon, Tom and Jerry, was selected by researchers for this study.

Task One was coded as: 0 – no reaction; 1 – smile/laugh; 2 – having words or movement performances (such as active imitation, verbal comments, etc.) without any laugh; 3 – laugh accompanied by words and actions (such as dancing). The researchers recorded the frequencies of the humor smiles, humorous words and humorous behaviors of participants in the experimental process.

*Task Two: music impromptu show.* The humor reaction from this task is reflected in children's words and actions. A children's humorous song "No naughty cats", which has witty and humorous lyrics, was the stimulus.

First, the researchers reviewed the lyrics with participants such as "Don't touch tape recorder to ring. Don't jump into the washing machine. If you open the refrigerator, cool air will freeze you to sneeze." They made sure that participants understood the lyrics content and the rules, and then let the participants sing and act out the humorous songs contents with the music accompaniment. The researchers recorded the participants' reactions when hearing the song.

This was coded according to the participants' reaction in the process of the music impromptu show. The participants who had no responses were coded 0; those who sang songs without action performances were coded 1; performance movements without singing were coded 2; both singing and acting was coded 3.

*Task three: Chinese characters game.* Four series of Chinese characters games were selected reflecting the researchers' interest in child attention to funny voices and

understanding of strange semantics. The researchers and young children played four series of Chinese characters in turn. For each series of the Chinese characters game, once they asked the question, the researchers made a little pause, and then told the answers to the children. The researchers' funny answering sound was the cause of humor in the first stage. In the rest of the series, the humor was due to semantics. The researchers observed the participants' response after hearing the characters and recorded their reaction after they heard the answers.

This section was coded according to participants' reaction in the whole process of Chinese characters games. For each series of Chinese characters game, participants who had no reaction were coded 0; any smile or laugh of reaction was coded 1; no laugh, but words or movement performances (such as action imitating, speech comment) was coded 2; and laugh with other words or actions was coded 3.

After these procedures were completed, the total scores and averages of the four series were calculated for the frequencies of humorous laughing, humorous words and humorous behaviors in the specific content of the experimental process.

### 2.3. Measures

*Sense of Humor Questionnaire for 3-5-year-old Chinese Children based on Teachers' Perception* (Liu Wen et al. 2009). This questionnaire contains 3 dimensions, and these are Humor-understood, Humor-coping and Humor-creating. This questionnaire consists of 28 items, and it is assessed by teachers. It is a 5 point rating scale, ranging from "1-never" to "5-always". Its coefficient of internal consistency reliability is .954, coefficient of retest reliability is .899, coefficient of split-half reliability is .921, and the coefficient of scorer reliability is .861. In this study, the coefficient of Alpha was .74, and coefficient of split-half reliability was .75.

*Temperament Questionnaire for 3-9-year-old Chinese Children based on Teachers' Perception* (Liu Wen et al. 2005). This questionnaire contains 5 dimensions, and these are Emotionality, Activity, Reactivity, Attention and Inhibition. This questionnaire consists of 28 items, and it is assessed by teachers. It is a 5 point rating

scale, with “1-never” to “5-always”. Its coefficient of split-half reliability is .77, coefficient of retest reliability is .95, and the coefficient of scorer reliability is .93.

*Humor Styles Questionnaire* (HSQ; Chen & Martin, 2007). This questionnaire contains 4 dimensions, and these are Affiliative humor style, Self-enhancing humor style, Aggressive humor style and Self-defeating. This questionnaire consists of 32 items, and it is completed by parents. It is a Likert 7 point rating scale, ranging from “1-strongly disagree” to “7-completely agree”. Its coefficient of internal consistency reliability is .77-.81, coefficient of retest reliability is .80-.85, and the coefficient of validity is .58. In this study, the coefficient of Alpha was .73, and coefficient of split-half reliability was .87.

### 3. Results

#### 3.1. Experimental tasks analysis

First, correlation analysis was performed on the humor experimental tasks, including cartoon appreciation, music impromptu show and the Chinese characters game.

Table 1 shows that there were significant correlations among the three experimental tasks, and they were highly correlated with total scores of the tasks. Partial correlation analysis further explored that, when factors of age and gender were fixed, the coefficients of correlation between the scores of tasks and total was still significant. This indicates that the tasks measured the same trait, while the tasks' aimed at different dimensions of humor. Converting the scores of the three tasks and the total into standard scores, a non – parametric test (Friedman) for correlated samples was performed to see whether the differences among the tasks were significant, and whether the difficulty levels were different. The results showed that, for the children, the difficulty levels of the three tasks were different ( $\chi^2=10.17$ ,  $df=3$ ,  $p < .05$ ) that is, they measured different or more complex variables.

Table 1. Coefficients of correlation and partial correlation between humor experimental tasks (N=110)

	Task 1	Task 2	Task 3	Total score of tasks
Task 1	1.00			
Task 2	.26 <sup>**</sup> (.25 <sup>**</sup> )	1.00		
Task 3	.25 <sup>**</sup> (.28 <sup>**</sup> )	.51 <sup>**</sup> (.40 <sup>***</sup> )	1.00	
Total score of tasks	.70 <sup>**</sup> (.74 <sup>***</sup> )	.80 <sup>**</sup> (.76 <sup>***</sup> )	.76 <sup>**</sup> (.69 <sup>***</sup> )	1.00

*Note:* Numbers in brackets are Coefficients of partial correlation. Task One is cartoon appreciation, Task Two is music impromptu show, and Task Three is Chinese characters games. <sup>\*\*</sup> means  $p < .01$ , <sup>\*\*\*</sup>  $p < .001$ .

After converting the total scores of the experimental task and the questionnaire results for sense of humor into Z scores, the correlation coefficient was  $r = .745$  ( $p < .001$ ), demonstrating that the results of the experimental tasks and the questionnaire responses were consistently related.

### Developmental Patterns of *sense of humor*

To understand the development pattern of sense of humor, the MANOVA (Multivariate Analysis of Variance) of the sense of humor's total scores was computed. The main effect of age was significant ( $F[2,104] = 78.198$ ,  $p < .001$ ), and the post hoc test showed that, children's sense of humor rose faster between age 3 and 4. For those of 4 to 5, the development was stable. Thus, the age of 4-years appears to be a turning point for the development of sense of humor. Overall, age was a major influence on the development of children's humor sense.

The interaction of gender with age was significant ( $F_{[2,104]}=14.922$ ,  $p < .05$ ) and results of a simple effect test showed that, compared with boys, girls' humor sense development changed the most from 3 to 5 ( $p < .05$ ).

### **3.2. Children's gender and age characteristic on different humor tasks**

Since sense of humor is multidimensional and complicated, MANOVA was performed to explore the characteristic of 3-5-year-old children's sense of humor, aiming at observing whether the humor task performances of children with different gender and age were different.

The results of MANOVA showed that the main effects of gender and age were highly significant ( $p < .001$ ), and the interaction between gender and age was significant ( $p < .05$ ).

The performances of boys and girls of 3-5-year-old were only significantly different on the third task, and girls' scores were higher ( $p < .01$ ). An independent sample  $t$  Test of the scores of humor questionnaire was computed, and it also showed that there were no significant differences ( $t = 1.45$ ,  $p > .05$ ). Only on the humor task about word games were girls' scores higher than boys.  $\chi^2$  test of the laugh frequency between genders also was computed ( $\chi^2=13.70$ ,  $df=16$ ,  $p > .05$ ) and indicated that girls and boys performed nearly the same on the explicit behavior of humor----laugh. Age was the main variable that affected children's humor development. There were significant differences among the three task scores for different ages, and the differences on Task Two and Task Three had higher probability of significance ( $p < .01$ ).

The interaction between age and gender on Task One and Task Three was significant ( $p < .05$ ). The results of simple effects test showed that, on Task One, boys of different ages performed with no obvious differences; while 4-year-old girls' scores were significantly higher than the 3-year-old ones ( $p < .05$ ); on Task Three,



5-year-old boys' scores were significantly higher than the 3-year-olds ( $p < .05$ ). The girls' scores on Task Three was greater from 3 to 4 years old, and until 4 to 5 years old, girls' performance on Task Three was obviously better than boys'.

### 3.3. The influential factors of 3-5-year-old children's sense of humor

*Relation of sense of humor and temperament* To explore whether temperament was related to humor sense, correlations were computed. Table 2 shows that there was a significant positive correlation between the total scores of 3-5-year-old children's sense of humor and the separate dimensions of temperament ( $r=.68$ ,  $p < .01$ ). The correlations between the dimensions of sense of humor and temperament were also positive. Humor-understood had a highest coefficient of correlation with Reactivity ( $r=0.51$ ,  $p < 0.01$ ), Humor-coping had a correlation with Activity ( $r=0.43$ ,  $p < 0.01$ ), and Humor-understood with Reactivity ( $r=0.49$ ,  $p < 0.01$ ). The correlations between Inhibition and Humor-understood, Humor-coping and the whole humor were all low. Table 2 shows the order of the correlations.

Table 2. Correlation analysis between 3-5 children's sense of humor and temperament ( $N=118$ )

	Emotionalit y	Activity	Reactivity	Inhibition	Attention	Total
Humor-underst ood	.39**	.37**	.51**	.19*	.31**	.57**
Humor-coping	.32**	.43**	.32**	.24**	.21*	.50**
Humor-creating	.43**	.49**	.44**	.21*	.24**	.61**
Total	.46**	.49**	.53**	.26**	.32**	.68**

Note: \*  $p < 0.05$ , \*\*  $p < 0.01$ .

### 3.3.1 Comparisons on 3-5-year-old children's sense of humor and temperament

In order to know whether individuals of different temperaments would have different levels of humor sense or not, ANOVA was conducted. Subjects into high, average, and low groups, and subjects' humor sense in different groups were compared.

Table 3 displays the significant differences on five dimensions of temperament among the three groups (high, average and low scores of humor). The high score group had high scores of Emotionality, Activity, Reactivity, Inhibition and Attention.

The multiple comparison test (LSD) showed that on the dimensions of Emotionality and Attention, there were significant differences between the high score group and the lower ones. On the dimensions of Activity and Reactivity, difference among all groups was significant ( $p < .05$ ), while on the dimension of Inhibition, there was only one significant difference between the high and low score group. Thus, children's temperament influenced their development of sense of humor to some degree.

Table 3. ANOVA analysis between SOH and temperament of 3-5-year-old children (N=118)

Total score of SOH							
	Low ( <i>n</i> =32)		Average( <i>n</i> =47)		High ( <i>n</i> =39)		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>
Emotionality	13.50	3.16	15.83	2.95	17.21	3.70	11.39 <sup>***</sup>
Activity	12.44	3.40	15.06	3.98	17.15	4.50	12.10 <sup>***</sup>
Reactivity	15.09	3.10	17.13	3.72	20.56	4.27	19.55 <sup>***</sup>
Inhibition	14.94	3.52	15.60	2.53	16.64	2.82	3.12 <sup>*</sup>
Attention	19.16	2.48	20.30	2.42	21.15	2.65	5.55 <sup>**</sup>

Note: SOH is short for sense of humor: \* means  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ .

### 3.3.2 Relations between children's sense of humor and parents' humor style

The results of correlation analysis between children's sense of humor and parents' humor style showed that there were positive correlations between the total score of

sense of humor and Affiliative parents' humor style, and on dimensions of humor. The correlation between Humor-understood and Affiliative parents' humor style reached the significant level ( $r=0.19$ ,  $p < .05$ ). Among the parents' humor styles, Aggressive style and Self-deprecating style had negative coefficients with the whole sense of humor and its dimensions.

After scores on the parent humor questionnaire were divided into three groups (high, average, and low) according to  $M \pm 0.67SD$  principle, ANOVA was computed. Table 4 shows that children whose parents' humor style is Affiliative tended to belong to the high score group ( $F[3,115]=3.30$ ,  $p < .05$ ). It suggested that parents' humor style played an important role in the development of children's sense of humor.

Table 4. ANOVA analysis between SOH of 3-5-year-old children's and the parents' SOH style

	Total score of Parents' SOH						<i>F</i>
	low( <i>n</i> =32)		average( <i>n</i> =47)		high( <i>n</i> =39)		
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Affiliative	28.2	7.07	31.43	6.08	31.77	6.03	3.30*
	3						
Self-enhancing	37.69	9.05	38.64	5.95	37.90	6.00	.21
Aggressive	31.47	6.29	30.57	6.41	30.26	5.37	.37
Self-defeating	21.0	6.30	22.72	7.87	21.10	5.57	.82
	9						

Note: SOH is short for sense of humor: \* means  $p < 0.05$ .

### 3.3.3. Multiple stepwise regression analysis on the humor development of 3-5-year-old children

To understand which variable had the bigger contributions for the sense of humor, the dimensions of children's age, temperament and the parents' humor style were regarded as independent variables, and the score of *Sense of Humor Questionnaire*

for 3-5-year-old Chinese Children's based on Teachers' Perception was regarded as dependent variable in a multiple stepwise regression analysis.

Table 5. Multiple stepwise regression analysis on related factors of children's sense of humor

variable	<i>B</i>	<i>SE</i>	<i>Beta</i>	<i>R</i> <sup>2</sup>	$\Delta R^2$	<i>t</i>	<i>F</i>
Z1-Emotional ty	1.667	0.253	0.43	0.280	0.006	6.590 <sup>***</sup>	45.218 <sup>***</sup>
			1				
Z2-Activity	1.495	0.248	0.39	0.462	0.010	6.038 <sup>***</sup>	49.291 <sup>***</sup>
			3				
Z3- Inhibition	1.090	0.377	0.19	0.501	0.013	2.889 <sup>**</sup>	38.202 <sup>***</sup>
			4				
Z4-Affiliative	0.400	0.169	0.15	0.525	0.017	2.366 <sup>*</sup>	31.181 <sup>***</sup>
			5				
Z5-Age	3.263	1.547	0.14	0.543	0.021	2.110 <sup>*</sup>	26.597 <sup>***</sup>
			1				

Note: \*  $p < 0.05$  , \*\*  $p < 0.01$  , \*\*\*  $p < 0.001$

Table 5 showed that, these variables accounted for 54.3% of total variance. Thus, dimensions of child's temperament, parent's sense of humor style and the child's age could predict the child's sense of humor development.

## Discussion

Humor processing research suggests that sense of humor involves different components, which means it is not one dimensional. Therefore, it is not possible to measure such multidimensional structure via a single method. The literature suggests that sense of humor is different in children and adults. Consequently, three tasks of different difficulties were designed for children. This study indicated that these tasks could be adopted as an effective and rational measurement tool. The

analysis showed humor sense was a multidimensional trait, and this was similar to previous study results.

#### **4.1. *The developmental tendency of children's sense of humor***

The results of this study demonstrated that the development of preschoolers' humor underwent a series of different manifestations at different ages. The overall trends in humor development corresponded to the age growth and the age of 4-year-old was an important turning point of the development of humor. Furthermore, if children are of different ages and genders, their humor's dimensions will develop at different speed. For instance, girls showed higher Humor-understood when 4 years old, whereas boys took about one year longer to reach this stage. Thus, the humor developing processes of boys and girls were not exactly the same. The reason may lie in physiological differences.

According to theoretical studies, the regular patterns of children's sense of humor and its types are dependent on the types of cognitive development level; therefore, preschoolers' age, development stage, and cognitive development trends are consistent. In this study, there were no significant differences between children age 3 and 5 in the cartoon appreciation task, explaining that even 3-year-old children have gained the ability to understand simple absurd and witty things. The age of 4 was an important turning point of the development of humor. It might be the result of physiological basis of the cerebral cortex development or of greater language development. Many studies have shown that cortex inhibition function is the premise for children to know things outside and to adjust and control their behavior, and the year between 4 and 5 is a time of great language vocabulary and syntax growth. The display of 5-year-old children's humor was sensitive to words. According to Martin (2001), 5-year-old children's humor has reached such a level as to make jokes or riddles by themselves, even to feel funny about exaggeration and surprising things.

#### **4.2. The related factors of children's sense of humor**

##### **4.2.1. The relationship between children's temperament and sense of humor**

This study adopted experiments and questionnaires to explore how temperament may play an important role in preschoolers' humor development. Those children who were highly emotional, highly active and who reacted fast and concentrated easily had a higher sense of humor and sustained attention. The research findings and the one undertaken by McGhee (1986) were consistent, namely the individual's sense of humor could be predicted by temperament. The dimensions of temperament also correlated with those of humor, and the strength was varied. For instance, Humor-understood and Reactivity related most; Humor-coping and Humor-creating related with Activity most; and Reactivity influenced sense of humor most. Martin (1996) reported that Emotionality was at the core of children's temperament. Studies on adult humor sense also have shown that highly positive emotions are bound up with humor.

##### **4.2.2. The relationship between sense of humor of children and parents**

Although children's sense of humor is diverse under different cultural backgrounds, most researchers agree that parents' positive emotional support affects the formation of children's positive emotions and makes their sense of humor come into being. The study supported McGhee (1979), whose early study of the frequency of laughter and speech acts of children in kindergarten and primary school showed that smooth mother-child interaction helped to support children's humor. Other researchers also found that other factors such as solidarity or conflict of family and mother's sympathetic reactions and type of control would affect children's humorous performance and comic behavior. Thus, the formation of children's sense of humor and the intimacy and support from parents are associated with each other.

## **5. Conclusion**

The factors influencing development of sense of humor were Reactivity, Activity and Inhibition of children's temperament, and affiliative style of parents' humor and age. McGhee (1986) and Liu and Zou (2009) suggested that one could predict how children's sense of humor developed by temperament. Thus, those who are intelligent, active and have high level of social inhibition and of self-control, and who have their parents positive emotional support have less conflict with companions, and are welcomed by teachers and classmates. Their interpersonal communication cultivates more positive emotions and creates a good environment which in return promotes their sense of humor.

The results of the study revealed a significant difference by age in humor development. Humor developed in an uneven track; it first blossomed and then the speed declined and even fell back slightly. The age of four was a turning point for children's development of the sense of humor. There was no overall difference in gender for 3-5-year-old children's sense of humor; however, an interaction between gender and age was evident, with 3 to 5 years old girls' understanding of humor being higher while boys did not reach that degree of understanding until age 5. There were close relationships among 3-5-year-old children's humor development, their temperament and their parents' humor styles. Children's age, temperament's Reaction, Activity, Inhibition, and parents' Affiliative humor style partially predicted the development of preschool children's sense of humor. A limitation is that it was a cross-sectional design, not a longitudinal study, so a more rigorous longitudinal design should be conducted later to explore more about the development of children's humor sense.

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