A study on the influence of psychological theory on the lying behavior of left-behind children

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Keywords: Psychological theory; Children left behind; Lying behavior

Abstract: In this study, 220 left-behind children aged 3-6 years were selected. The purpose of this study is to investigate the relationship between left-behind children's theory of mind and lying behavior and the differences in the development of left-behind children's theory of mind and lying behavior by using disappointment gift task, unexpected place task and unexpected content task. The results show that most left-behind children aged 3-6 can't lie spontaneously for their own benefit. After the training of psychological theory, the left-behind children will lie earlier. The behavior of lying through the training of psychological theory is stable. There is a significant correlation between lying behavior and false belief scores of left-behind children. Whether left-behind children lie or not has nothing to do with the understanding of false belief, which shows that there is no significant difference between lying and non-lying groups in completing the task of false belief. To sum up, it can be concluded that children's theory of mind can predict the occurrence of children's lying behavior, and the better the development of children's theory of mind, the more prosocial motives appear. The development of left-behind children's theory of mind, lying behavior and lying behavior motivation is slower than that of non-left-behind children.

1. Introduction

Theory of mind refers to the individual's understanding of the psychological state of himself and others, and thus makes causal prediction and explanation for the corresponding behavior. [1] Researchers usually use false belief task to evaluate the individual's theoretical ability of mind [2]. Research shows that there is a close relationship between children's theoretical ability of mind and peer acceptance [3], and children who often use psychological vocabulary in peer communication perform better on false belief tasks than other children [4]; However, the left-behind children's ability to understand false beliefs is lower than that of non-left-behind children [5]. Rural left-behind children are a special group in China, which refers to children whose parents or one of them has been working outside the home for at least the last 6 months. In recent years, the educational and psychological development of left-behind children has attracted educators' attention.

From some foreign research results at present, it is found that children's lying behavior has already occurred when they are young children, and it will be applied to various situations [6,7], whether it is an anecdote report, a case observation or an empirical experimental study. But when it comes to specific age and incidence, researchers have not reached a consistent conclusion. Early studies generally believed that children would not lie before the age of 4, because they didn't know what truth was at that time [8]. The current research results can only indirectly explain the understanding of belief or false belief from the occurrence of lying or cheating, and it is difficult to directly discuss the relationship between lying or cheating and the development of belief, so it is impossible to solve the hypothesis put forward by some researchers that lying or cheating ability is a key ability based on the acquisition of "psychological theory" [9-10].

This study takes rural left-behind children as the object, and discusses the influence of gender, age and peer acceptance type on rural left-behind children's psychological theory ability, in order to provide basis for cultivating rural left-behind children's good social development.

  DOI: 10.25236/emss.2021.110

2. Research process

2.1. Study subjects

By cluster random sampling, 220 left-behind children aged 3-6 years old were randomly selected from 3 rural kindergartens, and their speech expression ability, language understanding ability and intelligence development level were normal. All the subjects were physically and mentally healthy and had no color blindness and weak color (because there were two kinds of experimental materials, red box and blue box, in the task of false belief, children were required to be able to distinguish the color of experimental materials for the orderly conduct of experiments).

2.2. Research design

The experiment will adopt a single-factor pre-test design. The independent variable is children's self-interest lying (divided into two levels: training and repeated games), and the dependent variables are executive function and theoretical ability. Among them, the index of independent variable is the lying ratio (times) in lying task ("you win, I lose" game), and the index of dependent variable is the accuracy of Flanker-Fish task, the score of psychological theory task and the accuracy of day-night task. All subjects were randomly divided into two groups, one was the experimental group and the other was the control group. The experimental group was trained to lie, while the control group did not train but repeated the game.

2.3. Experimental materials and procedures

2.3.1. Lying behavior task

Create a "situation of resisting temptation": on the premise that the rule of the game is that you can't "pick up the cup and look at it", the subject and the subject begin to play the game of guessing things. There are many peanuts in the inverted cup. If the subjects pick up the cup and peek, the peanuts will spill out and it is almost impossible to recover. During the game, the master tried to go out for a minute and a half and record the whole process with a video camera. After the main test came back, I asked some questions to be asked:

Q1:Did you touch the cup when I went out? (If the subject answers "Yes", ask Q2; if the subject answers "No", ask Q3.

Q2:Do you see what's inside? If you answer "I didn't see it", ask Q3

Q3:What do you think is inside? For lying children, then ask a few questions:

Q5:Do you know how peanuts (physical evidence that cannot be recovered after being peeked) came out of the cup?

If the answer is "know", ask "how did you get out", and finish after recording. If a: "I don't know", continue to ask the following question (randomly): Did you open the cup and the peanuts came out? /Did peanuts run out by themselves? /Did anyone else come in and open the cup?

2.3.2. Experimental sequence

On the basis of familiarity with left-behind children, the experiments were conducted individually in a quiet room familiar to left-behind children. The subjects accepted all the above tasks; in each age group, half of the subjects do the lying behavior experiment first, and the other half finish the psychological theory task first. The whole experiment was completed in two times, and the interval between the two times was no more than one week.

2.4. Statistical method

Epidata3.1 was used to record the experimental data and establish a database. SPSS18.0 for Windows was used to analyze the research data statistically. Statistical methods such as $\chi 2$ test, independent sample T test, variance analysis, point two-column correlation and Logistic regression analysis were mainly used to analyze the data, among which $P<0.05$ was statistically significant.

3. Result analysis

3.1. Self-interest lies of left-behind children aged 3-6

It can be seen from Table 1 that in the whole lying task game, 60% of left-behind children aged 3-6 do not lie spontaneously for their own benefit, and 75% of children lie below 50%. This result is consistent with previous studies, and 65% of left-behind children aged 3-6 can't win rewards or lie even if they lose games all the time. Furthermore, binomial test was used to test the difference between children who lied (at least once) and children who did not lie. The results showed that there was a significant difference between children who did not lie and children who lied spontaneously ($p=0.006$). Therefore, most children aged 3-6 can't lie spontaneously for their own benefit.

Table 1 The number and percentage of children with different times of lying

Lying times	0	1	2	3	4	5	6	7	8	9	10
Number of children	176	11	9	2	7	2	2	1	0	3	7
Percentage of people (N=220)	80	5	4	0.9	3	0.9	0.9	0.5	0	1.4	3

3.2. Training of experimental group

The subjects in the experimental group were trained in three major psychological theory tasks for two weeks, and the average score of each training was shown in Figure 1. The average score of the first training was 3.22, and the average score of the sixth training was 7.72.

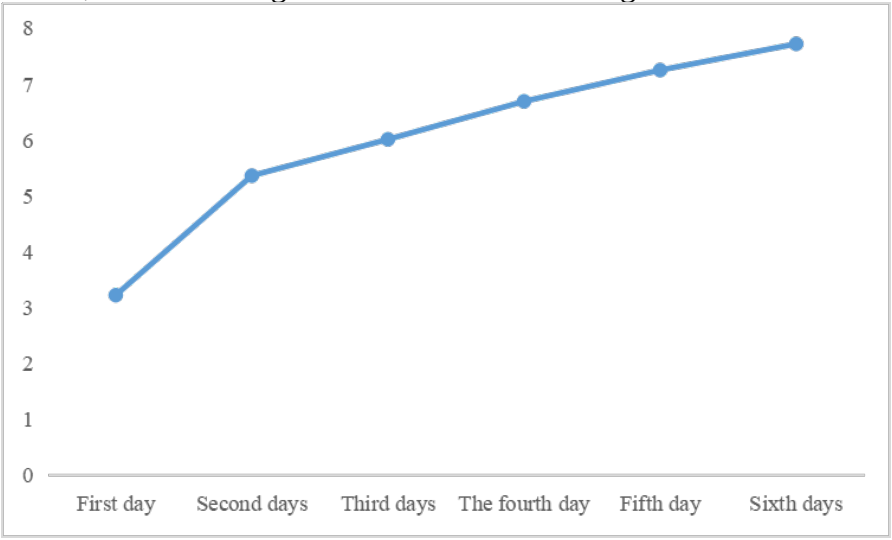

Figure 1 Average score of theoretical training in experimental group

Paired sample t-test was used to test the difference between the average scores of the first training and the sixth training. It was found that the average score of the sixth training was significantly higher than that of the first day ($t(20)=12.0314, p<0.05$).

3.3. The relationship between children's theory of mind and lying behavior

This paper makes a point two-column correlation analysis between lying behavior of children aged 3-6 and the total score of false belief. The results show that there is a significant positive correlation between lying behavior of 3-year-old children and false belief scores, while there is no significant correlation between lying behavior and false belief scores of 4-year-old children, 5-year-old children and 6-year-old children. See Table 2 for details. In order to further investigate the relationship between them, under the premise of controlling the age variable, this paper makes partial correlation analysis on children's lying behavior and false belief, and concludes that children's lying behavior and false belief score are significantly correlated.

Table 2 Point-two-column correlation analysis between lying behavior and false belief of children of different ages

Analytical index	Lying behavior of 3-year-old children	Lying behavior of 4-year-old children	Lying behavior of 5-year-old children	Lying behavior of six-year-old children
False belief	0.563	0.078	-0.114	0.364

3.4. Children's lying strategy and its relationship with psychological theory

In the research, we found that children lie differently and at different levels. Some children only know how to deny or say some illogical excuses, such as "peanuts came out by themselves", while others lie strategically and accord with general logic, such as "accidentally met" and "opened by other children". According to this, we divide lying into two levels, namely, lying without strategy and lying with strategy.

Figure 2 shows the results after classification. Chi-square test showed that there was a significant difference in age ($\chi 2= 11.29, p< 0.01$), that is, 6-year-old children had more strategies in lying than 3-year-old children, but there was no significant difference in gender ($\chi 2= 0.67, p> 0.05$).

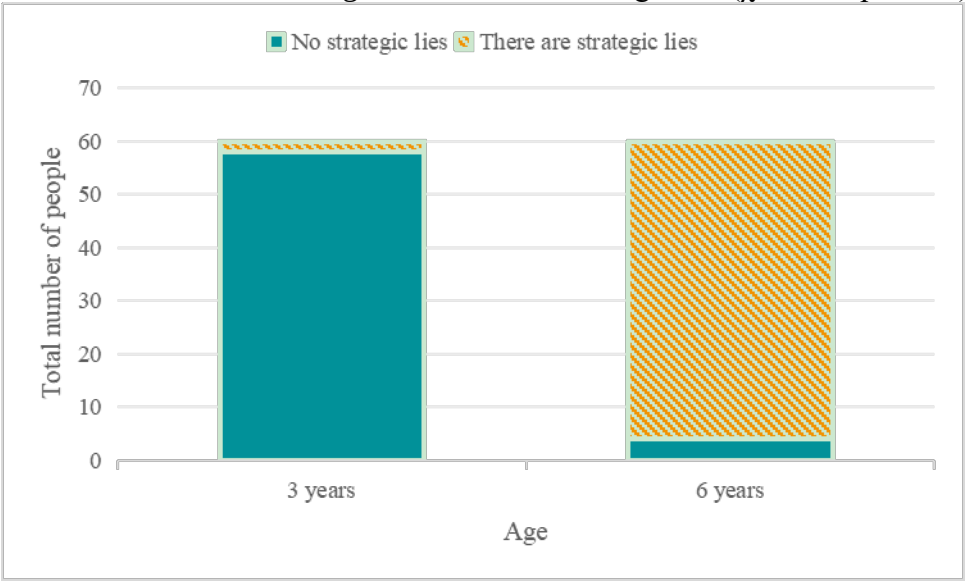

Figure 2 Children's lying strategy (n=120)

4. Discussion

There are many factors that lead to differences in the development of children's theoretical ability of mind. Among them, age, gender, parents' verbal communication and children's social behavior are all important factors that affect children's theoretical ability of mind, especially the social interaction with others in early childhood contributes to the development of children's theoretical ability of mind [7].

We found that compared with the whole task, 65% of left-behind children aged 3-6 are honest, and only 35% of children have lied at least once for prizes; If we only pay attention to the children's performance in the first game, 93% of the children are honest, which is consistent with the result that only one out of 15 children in literature [9] can mislead their opponents and let them open the box that they have nothing. In the course of our experiment, most children who tell the truth quickly shook their hands with stickers, but there are also a few children who hesitate for a while before telling lies. These children often tell the truth at the beginning of the game. With the development of the game, there are lying behaviors: only a small number of children have started to tell lies from the first time, and most of them have shown a trend from scratch in the game. It can be seen from this that the children in our experiment basically understand the rules of the game, but because of their lack of ability, they can't coordinate verbal behavior and nonverbal behavior, and at the same

time, the lack of desire for rewards at the beginning of the game is also the reason why 93% of the children tell the truth (compared with the overall 65% who tell the truth).

Before the experiment, we excluded the influence of intelligence, age, gender and other factors, and there was no significant difference in the scores of the psychological theory scale before the test. Through the two-week training, we can see the progress of the experimental group in the task of psychological theory from Figure 1, and the statistical results also show that the sixth training performance of the experimental group is significantly higher than that of the first one. At the same time, the results of paired sample test also show that the scores of the experimental group on the post-test theory of mind scale are significantly higher than those of the pre-test. However, there is no significant difference between the first and sixth psychological theory scores of the control group trained by the task of quantity conservation. It can be seen that the difference in post-test scores between the two groups is due to different training contents. The tasks of theory of mind and stories containing mental state terms have improved the subjects' ability of theory of mind.

According to the correlation between lying behavior of children of different ages and their theoretical level of mind, there is a significant positive correlation between lying behavior of children aged 3 and 6 and the total score of false belief, that is, the better the development of false belief of children in these two ages, the more lying behavior will occur. Because age is an important factor affecting children's theory of mind and lying behavior, after controlling the age variable, the research shows that children's theory of mind is significantly positively correlated with lying behavior, and other scholars have reached the same result [5]. It has been found that the higher the development of children's false beliefs, the greater the chance of denying their own mistakes when they make mistakes [2], which also proves that only by developing better false beliefs can children reason other people's emotions, consider other people's positions, and understand the importance of lying behavior to choose to tell lies.

The results of this study show that there is no significant difference in the scores of false belief tasks between the lying group and the non-lying group. Therefore, we believe that whether or not to lie after breaking the rules, that is, whether or not lying behavior appears has nothing to do with whether or not there is psychological theory or its development level. Lying behavior may be more reflective behavior [10], also related to daily education or behavior habits, and may depend more on the situation at that time (such as people and things involved, etc.). But when it comes to whether lying has strategies, we find that there is a significant correlation between lying level and false belief task, and among all lying children, those with strategies have higher scores on false belief task than those without strategies. This result further proves the point of [6], that before children can understand other people's false beliefs, they have lied to influence other people's behavior, not their beliefs; It is the constant improvement of children's understanding of beliefs and false beliefs that leads to the development of their ability to lie.

5. Conclusions

This study found that:

(1) Most 3-6-year-old left-behind children can't tell lies about their own interests spontaneously, and as the game goes on, more and more children will take the initiative to lie for the benefit.

(2) The psychological theory of left-behind children aged 3-6 can be improved through training. After the training of psychological theory, children will lie earlier. The behavior of lying through the training of psychological theory is stable.

(3) The lying behavior motivation of 3-6-year-old left-behind children gradually develops from self-protection motivation to prosocial motivation with the increase of age, and the older left-behind children have more prosocial motivation for lying behavior. There is no significant gender difference in lying behavior motivation of left-behind children.

(4) Whether left-behind children lie or not has nothing to do with the understanding of false belief, which shows that there is no significant difference between lying and non-lying groups in completing the task of false belief. However, the left-behind children with different lying levels have significant differences in completing false belief tasks, which shows that the left-behind

children with strategy lying group scored significantly higher than those without strategy group in false belief tasks. In addition, there is a significant positive correlation between lying level and false belief task. This result shows that only the level of lying is related to the level of false belief.

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