

Research on the Influence of Parents' Hearing Status on Emotional Understanding of Hearing-impaired Children Based on SPSS 20.0

Weifang Zhang¹

¹ The Office of the President, Shanghai Xingjian College, Shanghai, China

ABSTRACT

In this study, a self-designed emotional understanding questionnaire is used to reveal the influence of parents' hearing status on the emotional understanding of hearing-impaired children (kindergarten children and primary school students). The corresponding analysis is carried out through SPSS 20.0, in order to deeply understand the characteristics of hearing-impaired children's emotional understanding, and help them better return to the mainstream society. The research results show that the level of external emotional understanding, internal emotional state understanding and reflective emotional understanding of hearing-impaired children is lower than that of ordinary children, and the hearing status of parents is one of the important factors affecting the emotional understanding of hearing-impaired children.

Keywords: Parents' hearing status, Hearing-impaired children, Emotional understanding, Influence, SPSS 20.0.

1. INTRODUCTION: THE RISE OF THE QUESTION

The correct understanding and expression of emotion is one of the key factors for successful interpersonal communication. As an individual's subjective experience, emotion has the function of establishing, maintaining and changing the relationship between individuals and the outside world, which directly affects children's social development (Zhang, Liu & Shao 2015). Hearing-impaired children refer to children with permanent hearing impairment of varying degrees in both ears due to various reasons (Wang 2007). According to the second National sample survey of persons with disabilities, the total number of people with hearing disabilities in China is 27.8 million, including 137,000 children under 6 years old and 581,000 children under 17 years old (Sun, Yu & Qu 2008). As a large special group, hearing-impaired children cannot effectively acquire the meaning conveyed by auditory information such as intonation for effective interpersonal communication due to hearing impairment. Impaired interpersonal communication will lead to hearing-impaired

children's inability to understand or misunderstand social rules and mainstream cultural attitudes, and may cause difficulties in social adaptation (Wang, Wang & Shen 2018, Ma, Deng & Tao 2021).

Studies on the influencing factors of emotional understanding of hearing impairment have found that intelligence, gender, individual language ability, family emotional environment, individual parent-child attachment, and parents' hearing status affect the emotional understanding ability of hearing-impaired children (Michael, Southam-Gerow & Kendall 2000, Brody 1993, Pons, Lawson Harris & Rosnay 2003, Courtin & Melot 1998). In particular, it is speculated that the hearing status of the parents may have an important influence on the emotional understanding ability of hearing-impaired children, but there are very few studies on this aspect. This study attempts to reveal the influence of parents' hearing status on the emotional understanding of hearing-impaired children (children and primary school students) through a self-complied emotional understanding questionnaire, and conduct corresponding analysis in order to deeply comprehend the emotional understanding of hearing-impaired children. It can improve the

interpersonal communication ability of hearing-impaired children, enhance social adaptation, improve the quality of life, help them better return to the mainstream society, and further reduce the burden on society and families.

Based on the research of Harris and Pons et al. and referring to other studies, this study holds that emotional understanding belongs to a part of Wider Cognitive Development (Harris, 2001), and is an individual's understanding of external emotional states and internal emotional psychological states and their processes. It mainly includes three latitudes and ten components, which are :(1) the stage of understanding external emotions, including three components which are expression recognition, emotional situation recognition, and reminder understanding; (2) the state of understanding internal emotional states, including desire understanding, belief understanding and understanding of emotional expression rules; (3) reflective emotional understanding, including the understanding of mixed emotions, moral emotions, emotional regulation understanding and understanding of emotional causes. There is a hierarchical relationship between external emotional understanding, internal emotional state understanding and reflective emotional understanding. This study divides hearing-impaired

children into two categories according to their parents' hearing status: One is deaf children of hearing parents (DH children), and the other is deaf children of deaf parents (DD children).

2. RESEARCH METHOD

In order to research the Influence of parents' hearing status on emotional understanding of hearing-impaired children, the authors chose suitable participants and used reliable research tool.

2.1 Participant

The hearing-impaired children were recruited from an integrated kindergarten and a rehabilitation center for deaf children in Shanghai, and the hearing-impaired primary school children were recruited from three deaf schools in Shanghai, with 159 effective hearing-impaired subjects in total. The subjects of ordinary children come from two ordinary kindergartens and two ordinary primary schools in Shanghai, and there are 151 effective subjects of ordinary children in total. All subjects with hearing impairment have no other impairments except hearing impairment, and their admission tests shows that all subjects have normal intelligence. The specific distribution of subjects is shown in "Table 1".

Table 1. Statistical table of grade distribution of subjects

Grade	Group		Total
	Ordinary Children	Hearing-impaired Children	
Children	31	36	67
Grade 1	30	38	68
Grade 3	42	54	96
Grade 5	48	31	79
Total	151	159	310

2.2 Research Tool

A self-compiled children's emotional understanding questionnaire is used to investigate the influence of parents' hearing status on emotional understanding of hearing-impaired children. The questionnaire is designed according to three latitudes and ten components. As a result, the questionnaire is trustful and reliable.

2.3 Research Process

The data collection is conducted in an individual manner, and is collected by 3 test

subjects at the same time. Before the test is administered, we let the children familiarize themselves with the subject, and then use the form of storytelling to present the children with stories one by one. On the basis that children fully understand the content of the story, children are required to speculate on the mood of the protagonist in the scenario story, and choose from the facial expression pictures provided after each scenario story. Participants can say the answer (the similar meaning is also right), or choose directly on the picture. Facial expression comprehension uses a separate test paper. After the subjects complete the facial expression comprehension test, the subject

will explain the meaning of facial expressions. After we ensure the children's understanding, the rest tests are carried out. Children can take a short break after 20 minutes, and then complete the remaining test content.

After the questionnaire is completed, it is returned in time, and all the subjects are given small gifts to express the gratitude.

2.4 Data Processing

SPSS 20.0 is used for statistical analysis of the data. SPSS is used for statistical analysis and operation, data mining, predictive analysis and decision support tasks and so on. Most of the functions are presented visually. In this study, there are a large number of samples, so it is appropriate to apply SPSS 20.0.

3. RESEARCH RESULTS AND ANALYSIS

The authors analyze from multiple perspectives and obtain diverse results. The research results and analysis are shown as follows.

3.1 A Comparative Analysis of External Emotional Understanding of Hearing-impaired Children with Parents of Different Hearing Status

The hearing status of parents (both parents with normal hearing or at least one parent with hearing impairment) is taken as independent variables, and the scores of expression recognition, emotional situation recognition and reminder understanding of children with hearing impairment are taken as dependent variables. The results show that there are significant differences in external emotional understanding among children with hearing impairment whose parents have different hearing status ($F(1, 130) = 3.016, P = 0.034$). Further analysis shows that the scores of the hearing-impaired children with different parents' hearing status are significantly different in facial expression recognition and emotional situation recognition ($F(1, 130) = 7.704, P = 0.007; F(1, 130) = 5.548, P = 0.021$), and there is no significant difference in the reminder understanding ($F(1, 130) = 2.556, P = 0.113$). The specific situation of hearing-impaired children's external emotional understanding of parents with different hearing status is shown in "Table 2".

Table 2. A Comparison of four components of reflective emotional understanding between hearing-impaired children and ordinary children

Component	Hearing-impaired Children		Ordinary Children	
	M	SD	M	SD
Facial Expression Recognition	7.767	2.124	9.429	1.284
Emotional Situation Recognition	25.466	4.541	29.154	1.573
Reminder Understanding	5.291	2.243	6.429	1.742
Total Score of External Emotional Understanding	38.735	7.269	45.462	2.066

With parents' hearing status as the independent variable, the score of hearing-impaired children's understanding of five expressions of happiness, anger, sadness, fear and calm as the dependent variable, variance analysis is conducted. The results of variance analysis show that the expression recognition of hearing-impaired children with different parents' hearing status is significantly different ($F(1, 130) = 2.256, P = 0.045$). Further analysis shows that the understanding of calm expression of hearing-impaired children with different parents' hearing status is significantly different ($F(1, 130) = 10.322, P = 0.002$). The

specific understanding of five expressions of hearing-impaired children with parents of different hearing status is shown in "Figure 1".

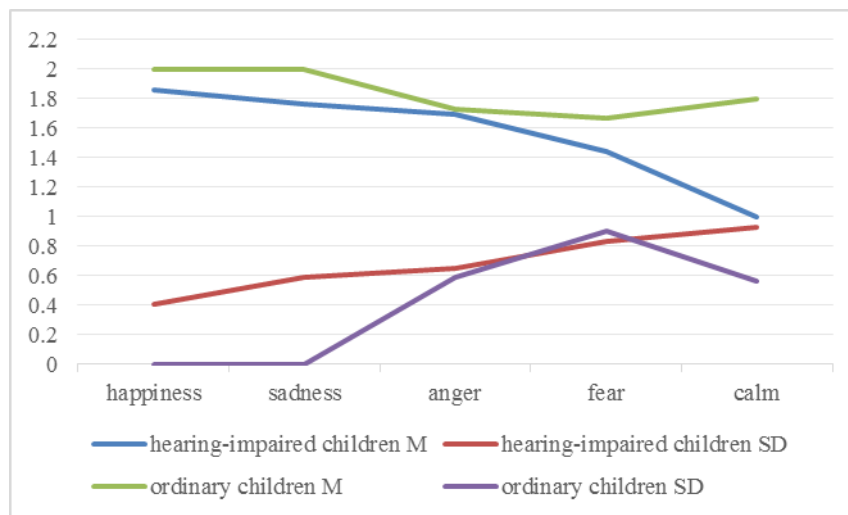


Figure 1 A comparison of five expressions of hearing-impaired children with different parents' hearing status.

3.2 A Comparative Analysis of Internal Emotional State Understanding of Hearing-impaired Children with Parents of Different Hearing Status

In order to further explore the parents listening situation of hearing-impaired children to understand the influence of the internal emotion, and the parents' listening situation (parents both normal hearing and at least one parent with hearing impairment) as the independent variable, the scores of hearing-impaired children's desire understanding,

belief understanding, understanding of emotional expression rules as the dependent variable, multivariate analysis of variance is conducted. The results of ANVOA show that there is no remarkable difference in the understanding of internal emotional states of hearing-impaired children with different parents' hearing status ($F(1, 125) = 0.140, P = 0.936$).

The specific understanding of internal emotional states of hearing-impaired children of parents with different hearing conditions is shown in "Table 3".

Table 3. A comparison of internal emotional state understanding of hearing-impaired children with parents of different hearing status

Component	Hearing-impaired Children		Ordinary Children	
	M	SD	M	SD
Desire Understanding	4.718	1.394	4.933	1.100
Belief Understanding	1.800	1.765	1.933	2.017
Understanding of Emotional Expression Rules	0.906	1.616	1.000	1.648
Total Score of Internal Emotional State Understanding	7.184	2.601	7.935	2.853

Although the influence of parents' hearing status on children's internal emotional understanding and its components is not significant, the data analysis finds that the hearing-impaired children of hearing-impaired parents have higher scores on internal emotional understanding and its components than the hearing-impaired children of hearing normal parents.

3.3 A Comparative Analysis of Reflective Emotional Understanding among Hearing-impaired Children with Different Hearing Status

In order to further understand the status of the parents listening reflections on hearing-impaired children's emotional understanding, the influence of

parents listening situation as the independent variable (parents both normal hearing and at least one parent with hearing impairment), hearing-impaired children's moral emotion understanding, mixed emotional understanding and emotional regulation understanding, and understanding of the emotional causes as the dependent variable, multivariate analysis of variance is performed. The results of variance analysis show that the reflective emotional understanding of hearing-impaired children with different hearing status is significantly different ($F(1, 128) = 2.854, P = 0.015$), and the reflective emotional understanding of DD children (with at least one hearing-impaired parent) is higher than that of DH children (with both hearing normal parents). Further analysis

shows that the scores of moral emotional understanding and emotional regulation understanding of hearing-impaired children with different hearing status are significantly different ($F(1, 128) = 5.184, P = 0.025$; $F(1, 128) = 6.023, P = 0.016$), while there is no significant difference between mixed emotional understanding and understanding of emotional causes ($F(1, 128) = 0.864, P = 0.356$; $F(1, 128) = 1.144, P = 0.147$).

The details of moral emotional understanding, mixed emotional understanding, emotional regulation understanding and understanding of emotional causes of hearing-impaired children with different hearing status of their parents is shown in "Table 4".

Table 4. A comparison of reflective emotional understanding of hearing-impaired children with different parents' hearing status

Component	Hearing-impaired Children		Ordinary Children	
	M	SD	M	SD
Moral Emotional Understanding	2.500	0.897	3.133	1.302
Mixed Emotional Understanding	3.405	1.300	3.867	1.187
Emotional Regulation Understanding	5.069	1.387	6.071	1.207
Understanding of Emotional Causes	4.263	2.197	5.267	1.280
Total Score of Reflective Emotional Understanding	15.662	3.098	18.500	3.057

4. DISCUSSION

The results show that DD children score significantly higher in external emotional understanding, facial expression recognition and emotional situation recognition than DH children. DD children's moral emotion understanding, emotional regulation understanding, understanding of emotional causes and reflective emotional understanding are also significantly higher than DH children's. DD children score higher in reminder understanding and mixed emotional understanding than DH children, but the difference is not significant.

4.1 The Influence of Parents' Hearing Status on External Emotional Understanding of Hearing-impaired Children

This study finds that DD children score significantly higher in external emotional understanding, facial expression recognition and emotional situation recognition than DH children.

DD children also score higher on reminder understanding than DH children, but there is no significant difference.

For those who were born in the normal hearing environment, because they don't have access to all kinds of auditory information, As a result, the frequency and time between DH children and their caregivers will be reduced. In the preschool stage, these hearing-impaired children unable to learn and master all kinds of emotional language used in the interaction with others, because they can't hear others speak. Others rarely show their emotions to them, and they get fewer explanations for other people's and their own emotions, which will cause their low level of emotional situation recognition. This situation will gradually ease as they establish a common language environment with the people around them, but it will take time. Therefore, DH children born in a normal hearing environment will lag in their understanding of facial expression recognition and emotional situation speculation due to adverse interactions with their caregivers (Peterson & Siegal 1998). DD children from families where at least one parent is hearing-

impaired or an older member is hearing-impaired do not have such problems, because they have mastered sign language well with the help of family members since childhood and are native signers who have used sign language since birth. When some hearing-impaired children talk with their hearing-impaired parents in sign language, they can involve some invisible ideas, objects and events, which is similar to the verbal communication between ordinary children and their normal parents. As a result, DD children are likely to develop a similar level of understanding of external emotions as normal children.

4.2 The Influence of Parents' Hearing Status on Internal Emotional Understanding of Hearing-impaired Children

Although the influence of parents' hearing status on children's internal emotional understanding and its various components is not significant, the results of data analysis show that the hearing-impaired children with hearing-impaired parents have higher scores on internal emotional understanding and its various components than the hearing-impaired children with normal parents. This is because children with native sign language hearing impairment (that is, children with parents or siblings who are proficient in sign language) performed better in the false belief task than children with acquired sign language hearing impairment (children who did not learn sign language until after primary school) (Courtin & Melot, 1998). Good performance in the false belief task help them better understand the emotional understanding based on desire and belief. In addition, these hearing-impaired children can involve some implicit ideas, objects and events when they talk with their hearing-impaired parents in sign language, which is similar to the verbal communication between ordinary children and their normal parents. As a result, these hearing-impaired children may develop an understanding of mental states similar to that of ordinary children. Therefore, the development level of native sign language hearing-impaired children is better than that of acquired sign language children in mispronunciation understanding and conceptual selection, and is expected to reach the level of ordinary children (Rommel, 2003).

4.3 The Influence of Parents' Hearing Status on Reflective Emotional Understanding of Hearing-impaired Children

Parents' different hearing status can significantly affect the reflective emotional understanding of hearing-impaired children, which is manifested in moral emotional understanding and emotional regulation understanding, DD children's performance is better than DH children's. DH children in hearing families lack appropriate means of communication because their parents are, at least initially, unable to communicate in sign language. As a result, DH children cannot smoothly communicate with their parents, and DD children cannot communicate with their parents or other hearing-impaired family members in sign language on the topic of psychological state. This is bound to affect DH children's understanding of emotional processes, including moral emotional understanding and emotional regulation understanding.

For those DH children born in a normal hearing environment, on the one hand, they cannot obtain information from auditory channels; on the other hand, family members also suffer frustration and failure in the process of how to properly express information. This affects the frequency and duration of communication between DH children and their caregivers, and ultimately affects the quality and content of their communication. Vaccari and Marschark (1997) suggest that hearing parents and hearing-impaired parents react differently to hearing-impaired children. Hearing parents are unable to respond adequately to their children's behavior because they lack effective skills to interact with their children. For these hearing parents, sign language is not their first language. The lack of fluency in sign language allows these parents to tell their hearing-impaired children what is happening, but not always explain why it happened and why they made their current decisions. These are difficult to accurately express in sign language and require a lot of time and effort. Even when hearing-impaired children participate in the conversation, they may find themselves unable to participate in the decision-making process because the event may have been settled while they struggled to obtain information about it. As a result, hearing-impaired children rely more on a way of articulating their wishes, such as "I want". This will be repeated if necessary. This excessive focus on desire in hearing-impaired children can be traced to two related phenomena. On the one hand, they are

unable to consciously obtain the decision-making behaviors of others and obtain the goals of others' behaviors through negotiation. On the other hand, they rely more on strategies that can achieve their personal desires more quickly, which do not require detailed communication and can achieve their goals the fastest. This strategy of "getting" leads to lower understanding of desires and beliefs. Moreover, throughout preschool, these hearing-impaired children do not acquire emotional language in their interactions with others. Because they can't hear others, they pay less attention to the range of emotions that hearing-impaired children exhibit. Hearing-impaired children lack explanations of others' and their own emotional performance, resulting in their low ability to recognize emotional situations. This situation persists until they establish a common language environment with the people around them (Marschark, 1993). It is this process that leads to poor inference of other people's facial expressions and emotional situations (Peterson & Siegal, 1999). In addition, hearing parents are less patient with hearing-impaired children than hearing-impaired parents (Wood, 1991). In other words, hearing-impaired children in normal hearing environments have limited time and means of communication with their hearing peers and parents. For hearing-impaired children whose parents have normal hearing, they will make more effective use of their communication time to ensure that others understand their ideas accurately, and eliminate other ways that may cause misunderstanding. Therefore, the communication style of preference for wish expression may be the idiomatic pattern of hearing-impaired children.

For DD children, they can master the use of sign language well in their families from an early age, and they are native signers who use sign language after birth. Their way of interacting with their parents is similar to that of ordinary children, which is because these hearing-impaired children are able to express implicit ideas, objects and events with gestures or expressions when they communicate with their deaf parents in sign language. This is similar to how normal children communicate with their normal parents. Moreover, relevant studies on theory of mind have confirmed that DD children (deaf children of deaf parents) perform better in false belief task than acquired deaf children (children who started to learn sign language after primary school). Good performance of DD children in false belief task enables them to better master desire understanding and belief understanding. There is a positive correlation

between children's false belief understanding level and their emotional comprehension ability. These DD children with better understanding of false beliefs may develop an understanding of mental states similar to that of ordinary children with normal hearing status.

5. CONCLUSION

In conclusion, the level of external emotional understanding, internal emotional state understanding and reflective emotional understanding of hearing-impaired children is lower than that of ordinary children, and the hearing status of parents is one of the important factors affecting the emotional understanding of hearing-impaired children.

REFERENCES

- [1] Brody, L. R. On understanding gender differences in the expression of emotion: Gender roles, socialization, and language. *Child Development*, 1993, 43: 112-135.
- [2] Courtin, C. & Melot, A. M. Development of theories of mind in deaf children. *J. Child Development*. 1998, 62(4), 344-367.
- [3] Harris, P. L. *Children and Emotion: Mixed Emotions*. Oxford: Blackwell Publishers. 2001.
- [4] Ma, X., Deng, T. & Tao, Y. Development of emotional Competence in children with hearing impairment. *J. Chinese School Health*. 2021, 12, 1912-1915.
- [5] Marschark, M. *Psychological development of deaf children*. New York: Oxford University Press, 1993.
- [6] Michael, A., Southam-Gerow, P. & Kendall, C. A preliminary study of the emotion understanding of youths referred for treatment of anxiety disorders. *J. Journal of Clinical Child Psychology*. 2000, 29(3), 319-327.
- [7] Peterson, C. C. & Siegal, M. Changing focus on the representational mind. Deaf, autistic and normal children's concepts of false photos, false drawings and false beliefs. *British Journal of Developmental Psychology*. 1998, 16, 301-320.
- [8] Pons, F., Lawson, J., Harris, P. L. & Rosnay, M. *Individual Differences in Children's Emotion Understanding: Effects of age and*

- language. *J. Scandinavian Journal of Psychology*. 2003, 44, 347-353.
- [9] Rimmel, E. Theory of mind Development in signing deaf children. *The Sciences and Engineering*. 2003, 64(3), 1526.
- [10] Sun, X. B., Yu, L. M., Qu, C. Y., et al. Hearing disability in China: A review. *J. Chinese Journal of Hearing and Speech Rehabilitation*. 2008, 2, 21-24.
- [11] Vaccari, C. & Marschark, M. Communication between parents and deaf children: Implications for social-emotional development. *J. Journal of Child Psychology and Psychiatry*. 1997, 38, 793-801.
- [12] Wang, J., Wang, W. Y., Shen, Q. P., et al. A comparative study of emotional comprehension in preschool deaf children and hearing children. *J. Chinese Journal of Special Education*. 2018, 4, 32-39.
- [13] Wang, Z. Y. Children with hearing impairment: A review. M. Tianjin Education Press. 2007, 1.
- [14] Wood, D. Communication and cognition: How the communication styles of the hearing adults may hinder-rather than help-deaf learners. *J. American Annals of the Deaf*. 1991, 136, 247-251.
- [15] Zhang, C. X., Liu, W. & Shao, S. H. The relationship between emotional competence and maternal temperament. *J. Journal of Studies in Early Childhood Education*. <http://www.xqjyyj.com/>, *Preschool Education Studies Journal Agency*. 2015, 3,10-16.