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The Relationship Between Vocabulary Size and Emotion Understanding in Children Aged 5–7 Years

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Abstract

Background. Vygotsky's idea of the affect and intellect unity continues to be developed empirically. Much attention is paid to the child's emotional development, which affects social and academic effectiveness. Knowledge regarding the relationship between language and emotional development within the social situation helps to better understand the developmental characteristics of preschool children in general and create the necessary corrective programs.

Objectives. The aim is to study the characteristics of the relationship between language and emotional development (based on the general and emotional vocabulary size) and the level of emotion understanding at preschool age.

Study Participants. The study involved 341 children aged 57 to 90 months (M = 75.42 months; SD = 7.65 months). 170 children were from the senior groups of the preschool educational institution (M = 69.09 months; SD = 4.4 months), and 171 children were from the preparatory groups of the preschool educational institution (M = 81.67 months; SD = 4.2 months).

Methods. To assess the general vocabulary size the Peabody Picture Vocabulary Test was used. To assess the volume of active and passive emotional vocabulary, the Roepstorff "Emotional Vocabulary" test was used. To assess ability to understand emotions in preschoolers, F. Pons's "Test for Emotions Comprehension" method was used.

Results. It was found that age is significantly associated with indicators of general and emotional vocabulary size, as well as with the understanding of emotions in all identified aspects. Different levels of emotion understanding have different relationships with vocabulary, both general and emotional. An important result is the identification of the significance of the contribution of active rather than passive emotional vocabulary to emotion understanding, suggesting a significant

role of verbalisation of the emotional state, helping preschoolers to better understand emotion.

Conclusions. The study showed that language development influenced the understanding of emotions in preschool age. At the same time, with age there is an increase in the size of children's general and emotional vocabulary, as well as their ability to understand emotions.

Keywords: preschool age, emotions understanding, general vocabulary, emotional vocabulary

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Introduction

L.S. Vygotsky showed that not only higher mental functions, but mental development as a whole is based on sign mediation, the role of which in the development of emotions has been far less studied (Veraksa, Dyachenko, 1996; Pervichko, 2016). From this point of view, the problem of the relationship between emotion understanding and speech development, vocabulary in particular, in preschoolers receives a new interpretation (Shablack, Lindquist, 2019; Sarmento-Henrique et al., 2020). Preschool age is a period of active emotional and personal development (Elkonin, 2006; Solovieva et al., 2021). Therefore, studying this relationship during this period is not accidental (Fomina et al., 2023; Joukova et al., 2023; Voltmer, von Salisch, 2022). Understanding emotional expressions and situations, as well as the ability to talk about the causes of emotions, helps children communicate their own feelings and predict the behaviour of others (Liew & Zhou, 2022). Understanding emotions is a significant tool in managing one's feelings and resolving interpersonal conflicts (Torres et al., 2015). The ability to understand emotions mediates emotional expressiveness, guilt, and prosocial behaviour in children (Strayer, 1980; Denham, 1986), promotes self-regulation skills (Morosanova et al., 2022; 2023), and is significantly associated with social competence and positive relationships with peers (Denham et al., 1990). Additionally, the development of emotion understanding has been shown to be positively correlated with later academic success in school (Cavadini et al., 2021; Voltmer, von Salisch, 2022).

The development of the emotional sphere is closely related to sign mediation (Zaporozhets, 1986; Leontyev, 1971; Rubinstein, 1946). Human thinking occurs in the form of concepts, and they, in turn, need support

from words. Based on the teachings of L.S. Vygotsky, the ability to realise one's emotions and feelings can be attributed to higher mental functions (HMF). Speech is the means of formation, while communication and play are the conditions (Vygotsky, 1983).

Thus, identifying predictors of emotional development, in particular the level of children's understanding of emotions, remains an important and urgent task for modern psychology. This article makes an attempt to determine the contribution of the child's general vocabulary and emotional vocabulary to the level of emotion understanding. It also seeks to monitor whether this contribution changes from the senior group of preschool educational institutions (aged 5 years) to the preparatory group (aged 6 years).

Development of emotion understanding, emotional vocabulary and speech at the preschool age

The development of the affective sphere follows the same logic as the development of other mental functions. The development of emotions occurs in the direction of awareness and differentiation. Emotion understanding develops as a result of children's assimilation of social experience, and emotions themselves regulate their activities (Vygotsky, 1984). All emotional experience is reflected in the process of verbal communication. As a result of the experience in interacting with the environment, a person develops an individual version of the language system and the unique picture of the world.

Research shows that at the age of 3–4 years, a child begins to understand his own and other people's emotions and their reasons. This is how the "model of mind" (Sergienko et al., 2009) or "theory of consciousness" (Pons et al., 2010; Almazova et al., 2018) is formed. However, for a child at this age, it is still difficult to separate himself and the "other", as well as to evaluate feelings outside the situation. Significant changes in the development of theory of consciousness occur at the age of 5–6 years, when children are able to compare their own view of the situation with that of the other. Thus, situational independence is formed (Sergienko et al., 2009).

A child's emotional vocabulary develops through activity. The very mastery and development of emotional vocabulary is associated with the understanding of emotions as the highest mental function (Zaporozhets, 1986; Veraksa, Dyachenko, 1996). Particularly significant are the motives and goals that form emotional ideas about reality (Zaporozhets, 1986).

Preschoolers' emotional vocabulary grows with age, with older children learning more emotion words than younger children (Roepstorff et al., 2022).

Within the framework of the cultural-historical concept of L.S. Vygotsky, it is important to mark the theory of the development of emotions perception in preschool children based on sign mediation, developed by A.M. Shchetinina (Shchetinina, 1984). Based on the collected empirical data and previous works of A.V. Zaporozhets (Zaporozhets, 1986) on the formation of an understanding of emotions in preschoolers (from 4 to 7 years old), the author identifies five levels, which indicate a gradual increase in the complexity of emotion perception. These levels are described as follows: inadequate, situationally specific, the level of verbal designation and description of expression, the level of comprehension in the form of description, the level of comprehension in the form of interpretation and the manifestation of empathy. It must be emphasised that, according to Shchetinina, the most important criterion for a child's transition to a new level of perception of emotions is the ability to verbalise emotions, which emphasises the role of speech and vocabulary development in the development of emotion understanding in preschoolers (Shchetinina, 1984).

Currently, the most common theory of the development of emotion understanding is the theory of F. Pons, P. Harris and M. de Rosnay (Pons et al., 2004; De Rosnay, Hughes, 2006). They identified three components in the ability to understand emotions: external, mental, and reflective components (Veraksa et al., 2021). "External" understanding of emotions involves recognising emotions, identifying emotions that are caused by external causes, and recognising that memories can recreate a previous emotional response. Pons and colleagues found that children begin to understand these aspects of emotion by the age of three and that most of them demonstrate mastery of these concepts by the age of five. The "mental" component of emotion understanding involves latent affect and the knowledge that desires and beliefs cause emotional responses. Children demonstrate a basic understanding of these components of emotion by the age of five, with most demonstrating mastery by the age of seven. Finally, the third component of "meta" underlies regulated, ambivalent and moral emotions. About one third of children express understanding by the age of seven, and at least half of children by the age of nine (Pons et al., 2004).

On the other hand, at the preschool age, the child activel develops speech and vocabulary increases significantly (Vygotsky, 1983; Stahl, 1999). In communication, values are acquired; social connections are formed; knowledge of the surrounding world occurs; and cultural and social norms are assimilated (Bezrukikh et al., 2021; Vygotsky, 1983; Zaporozhets, 1986; Leontyev, 1971). The development of speech is closely related to the development of consciousness and knowledge of the surrounding world

(Leontyev, 1971; Zaporozhets, 1986; Vygotsky, 1960, etc.). At the preschool age, a transition to non-situational-personal communication occurs. The child can talk about objects that are not in his field of vision (Vygotsky, 1983; Lisina, 2009).

At the senior preschool age, awareness of the relationship between an object and the word that denotes it develops. Denoting the function of the word, L.S. Vygotsky termed this "subject relatedness" (Vygotsky, 2021, p. 142). With its help, a person can evoke images of objects needed. Initially, a word stands out in a certain situation and is relevant only to it. Further, as a result of development, the word loses its connection with a specific situation and receives a stable subject reference (Vygotsky, 2021).

Thus, the emergence of emotions is most often associated with the child's assessment of an object and with the expression of the attitude towards this object in the process of interaction with an adult, which indicates the internal relationships of communicative activity and emotions (Lisina, 2009). In addition, emotional development is often associated with the development of empathy (Kornilova, 2022).

The relationship between vocabulary and emotion understanding at the preschool age

Language can not only translate feelings into words, but can also help define those feelings from the very beginning. The dictionary of emotions is a collection of verbal designations of emotional states that help to realise them. The formation of such a vocabulary occurs precisely in preschool childhood (Gordeeva, 1995).

Language as a general means of cognitive representation helps children mentally store and access knowledge about emotion concepts, including associated experiences, causes, and consequences. It plays a key role in the acquisition and development of emotion understanding (Pons et al., 2003; Harris et al., 2005; Cole et al., 2010; Holodynski et al., 2013).

The work of F. Pons and coworkers made a great contribution to the development of this concept. They conducted a study that found that age and language ability together explained 72% of the variance in emotion understanding, 20% of this variance was explained by age alone, and 27% by language ability alone (Pons et al., 2004). P. Harris and F. Pons (Harris et al., 2005) in the course of their study concluded the following regarding the connection between language abilities and understanding of emotions: the better the speech development, the better children understand emotional experiences. To date, a body of empirical evidence shows a strong relationship between preschoolers' individual differences in language skills

(especially vocabulary) and emotion understanding (Denham et al., 1994; Cutting, Dunn, 1999; Izard et al., 2001; Pons et al., 2003; Ruffman et al., 2003; Bohnert et al., 2003; Bosacki, Moore, 2004; Trentacosta, Izard, 2007; Downs et al., 2007; Beck et al., 2012).

Most research on the role of language in children's understanding of emotion has focused on the influence of general vocabulary (Denham et al., 1994; Cutting and Dunn, 1999; Izard et al., 2001). However, the role of emotional vocabulary in children's development of emotion understanding has not been taken into account. V. Ornaghi and I. Grazzani revealed a connection between children's vocabulary specific to emotions and the components of their understanding (Ornaghi, Grazzani, 2013). F. Pons and colleagues also confirmed that the vocabulary of emotions is related through an intermediate link to both the speech and emotional development of the child (Pons et al., 2003). The relationship between the development of emotional vocabulary and the level of emotional competence of preschool children has been confirmed (Strubel et al., 2020). The size of emotion-specific vocabulary has been shown to be a strong predictor of the level of development of emotion understanding. The contribution of emotional vocabulary was higher than the contribution of general vocabulary.

Purpose and hypotheses of the study

As noted above, scientific research shows the relationship between emotion understandin emotions and vocabulary size (including emotional) in preschoolers (Denham et al., 1994; Cutting, Dunn, 1999; Izard et al., 2001; Pons et al., 2003; Ornaghi, Grazzani, 2013; Streubel et al., 2020). However, the direction of this connection, the cause and the effect, have not yet been clarified. Based on the ideas of Vygotsky (Vygotsky, 1983), we assumed that speech predetermines the understanding of emotions. At the same time, modern studies of the relationship between vocabulary and emotion understanding (Ornaghi, Grazzani, 2013; Streubel et al., 2020) demonstrate a greater contribution of emotional vocabulary as an intermediate link (Pons et al., 2003) rather than that of the general vocabulary. Thus, the main hypothesis of our study was the assumption that emotional vocabulary makes a greater contribution to preschoolers' understanding of emotions compared to general vocabulary. This is consistent with the idea of sign mediation in the development of emotions as HMF (Zaporozhets, 1986). It is the ability to name emotions and emotional states that allows one to move to a new level in the child's emotional development and improve performance in understanding emotions.

In addition, it is not well understood whether there is a relationship between vocabulary size and emotion understanding throughout the preschool period of childhood or whether this relationship differs depending on the age of children. It seems that this aspect is extremely important, since it is the preschool educators, along with the family, that constitute the social situation of the child's development and determine their emotional and cognitive development. Accordingly, early childhood education programmes vary based on age group rather than the actual age of the child (Veraksa et al., 2016).

Thus, this study attempts to trace how sign mediation in the understanding of emotions affects the development of their understanding in children from 5 to 7 years old, including the analysis of age-related changes.

Sample

Our study sample consisted of 341 children aged 57 to 90 months (M = 75.42 months; SD = 7.65 months). Of these, 172 (50.4%) were boys and 169 (49.6%) girls. 170 children (49.9%) aged 5–6 years, from older groups of preschool educational institutions in Moscow (M = 69.09 months; SD = 4.4 months), and 171 children (50.1%) in aged 6–7 years, from preparatory groups of a preschool educational institution in Moscow (M = 81.67 months; SD = 4.2 months).

Techniques

To assess the general vocabulary size of preschool children, the Peabody Picture Vocabulary Test, 4th version (Dunn, Dunn, 2007), which was tested in Russia (Kartushina et al., 2022), was used. The Peabody Test is a 175-page booklet with each page containing 4 illustrations of common objects. The test is carried out as follows: the examiner names a stimulus word (for example, "candle") and asks the subject to point a finger at the correct picture corresponding to the named word. For each correct answer, the child receives 1 point; for an incorrect one — 0 points. The technique stops when the child chooses 8 or more incorrect answers in a block of 12 questions.

The Emotional Vocabulary Test (Roepstorff et al., 2022) was used to assess the size of active and passive emotional vocabulary. To diagnose passive emotional vocabulary, children were given a page with four photographs of children depicting different emotions. The child had to choose a photo that depicted a specific emotion. For a correctly selected photo, the child received 1 point. Children were presented with 3 series of tasks, 4 images each. Accordingly, the general level of the passive emotional vocabulary is expressed by a sum of points from 0 to 12. To diagnose the active emotional

vocabulary, children were given one photograph and four options for different emotions. For the correctly chosen name of the emotion, the child received 1 point. There were 4 pictures in one series; in total, the children were presented with 3 series of tasks. Accordingly, the overall level of active emotional vocabulary is expressed by a sum of points from 0 to 12.

To assess emotion understanding in preschoolers, the Test of Emotion Comprehension (Pons, Harris, 2000; Veraksa et al., 2021), intended for children aged 3 to 11 years, was used. Test stimulus material is an illustrated book with simple stories. In each task, the child is told a story and then asked to choose "the feeling that the character of the story experiences" from four drawings with different facial expressions of the character. Children's answers are non-verbal; they only need to indicate the selected option. The test contains questions to evaluate child's understanding of the stories. The technique has a three-component structure for understanding emotions, which includes external, mental and reflective components. For each of the three components, scores vary from 0 to 3. The final score according to the method is calculated as the sum of the points received by the child for the three components (from 0 to 9 points).

Procedure

The study was conducted individually in a quiet and bright room of the preschool educational institution, which the children were visiting at the time of testing. One meeting lasting 15–25 minutes was organised with each child. For participation, all children received a small gift (sticker). All methods were presented to children in the same established order. The assessment was carried out by trained specialists (students and graduate students of the Faculty of Psychology of Lomonosov Moscow State University).

All parents were informed of the purposes of the study and gave written consent for their children to participate in the study.

Research results

Checking the distribution using the Kolmogorov-Smirnov test showed that the values in some cases did not correspond to the normal law, and therefore nonparametric tests were used in further analysis.

A comparative analysis of indicators of development of vocabulary size and understanding of emotions among children of two groups (5–6 and 6–7 years old) showed that children from these groups have significantly different indicators of vocabulary volume and understanding of emotions (Mann-Whitney test, $p < 0.001$). As can be seen from the results presented in Table 1, with age, preschoolers understand emotions better, and their emotional and general vocabulary increases.

Table 1
Descriptive statistics for vocabulary and emotion understanding development in different age groups

	Group of children 5–6 years old		Group of children 6–7 years old		Mann-Whitney criterion
	Mean	Standard Deviation	Mean	Standard Deviation	
General vocabulary	109.5	19.6	119.8	19.6	10282*
Passive emotional vocabulary	9	1.9	10	1.7	10331*
Active emotional vocabulary	9.4	1.8	10	1.4	11902*
Emotions comprehension, External component	2.4	0.7	2.7	0.5	12487*
Emotions comprehension, Mental component	0.8	0.6	1.7	0.9	7846*
Emotions comprehension, Reflective component	1.1	0.8	1.4	0.9	13362*
Understanding emotions, Total score	4.4	1.3	5.8	1.5	7851*

* — $p < 0.001$

Analysis of the relationship between emotion understanding and vocabulary size in preschool children

Correlation analysis (using Spearman's correlation coefficient) of the relationships between the results on the techniques for general and emotional vocabulary showed that the volume of active emotional vocabulary was interrelated with the volume of general vocabulary in both age groups (at 5–6 years: $r = 0.253$ at $p < 0.01$; at 6–7 years: $r = 0.353$ at $p < 0.01$), while passive emotional vocabulary did not significantly correlate. Moreover, a significant relationship was found between active and passive emotional vocabulary in children 5–6 years old ($r = 0.375$ at $p < 0.01$) and 6–7 years old ($r = 0.424$ at $p < 0.01$).

In addition, a correlation analysis of the relationships between indicators of general and emotional vocabulary and the level of understanding of emotions was conducted separately in children 5–6 and 6–7 years old (Table 2).

It is interesting to note that the mental and reflective components of the Emotion Understanding Test correlated significantly with general vocabulary size in children aged 6–7 years only, and the total score on this test correlated with general vocabulary size for both age groups.

Table 2
Relationships between the results of techniques for general and emotional vocabulary and for emotion understanding in children aged 5–6 and 6–7 years

	Emotions comprehension. External Component		Emotions comprehension. Mental Component		Emotions comprehension. Reflective Component		Emotions comprehension. Total score	
	5–6 years	6–7 years	5–6 years	6–7 years	5–6 years	6–7 years	5–6 years	6–7 years
General vocabulary	0.121	0.131	0.139	0.223**	0.107	0.292**	0.200**	0.336**
Passive emotional vocabulary	0.024	0.127	–0.081	0.041	0.112	0.234**	0.066	0.190*
Active emotional vocabulary	0.172*	0.241**	0.086	0.201*	0.146	0.143	0.226**	0.279**

** — $p < 0.01$; * — $p < 0.05$ (2-tailed)

Passive emotional vocabulary correlated with the reflective component and total emotion understanding scores only at ages 6–7 years. Active emotional vocabulary correlated with the total score and the external component of the Emotion Understanding Test in both age groups, as well as with the mental component at age 6–7 years.

Results of the analysis of the contribution of general and emotional vocabulary to emotion understanding in preschoolers

In order to test the hypothesis regarding the greater contribution of the emotional vocabulary to the understanding of emotions by preschoolers, a linear regression analysis was carried out on the contribution of the general and emotional vocabulary. Using the Kolmogorov-Smirnov test, the normality of the distribution of the total sample of all children aged 5–7 years on which this analysis was carried out.

The dependent variable was the total score on the Emotional Understanding Test. The independent variables were the results on tests of general vocabulary and active and passive emotional vocabulary. To control for significant age effects when analyzing the contribution of children's vocabulary to understanding emotions, we introduced the factor of membership in a specific age group, corresponding to the preschool group the children attended: 5–6 years old (senior group) or 6–7 years old (preparatory group).

The resulting model predicted 37.9% (regression model parameters: $R = 0.616$, $F = 42.309$, $p < 0.001$) of the total score on the emotion understanding test. This regression model shows that general vocabulary size and active emotional vocabulary are predictors of emotion understanding in preschool students. At the same time, the volume of passive emotional vocabulary is not a predictor of the level of development of understanding of emotions in preschoolers (Table 3). The age group of the children is also significant, which once again shows that children 6–7 years old (preparatory group of the preschool) showed significantly higher results in the method for understanding emotions than children 5–6 years old (older groups of the preschool).

In addition, the value of the Durbin-Watson test ($DW = 1.923$) shows that the existing correlations between tests for general and emotional vocabulary do not distort the connections identified using regression analysis.

Table 3
Regression model of the dependence of understanding emotions on indicators of speech development

Model	Unstandardized coefficients		Standardized coefficients	t	p
	B	Std. Error			
Constant	4.526	0.663		6.823	<0.001
Age group	–1.520	0.165	–0.460	–9.212	<0.001
General vocabulary	0.013	0.003	0.203	3.967	<0.001
Active emotional vocabulary	0.107	0.048	0.118	2.209	0.028
Passive emotional vocabulary	0.055	0.041	0.070	1.339	0.182

The discussion of the results

The purpose of this study was to empirically study how, at the ages of 5 to 7 years, the sign mediation of a child's emotional development occurs, particularly emotion understanding. This process was analysed based on the relationship between vocabulary size and understanding of emotions in different stages of preschool.

It has been shown that with age, preschoolers begin to understand emotions better, and their emotional and general vocabulary increases. The data are in good agreement with the results of previous studies (Sergienko et al., 2009; Pons et al., 2004) and, in particular, with data from a study of emotion word understanding in preschoolers conducted by I. Ropstorf and

colleagues, which similarly showed a general effect of age on emotional vocabulary size (Roepstorff et al., 2022).

In all age groups, general and emotional vocabulary techniques were significantly associated with emotion understanding (total technique score), which is consistent with a large number of previous studies (Denham et al., 1994; Cutting, Dunn, 1999; Harris et al., 2005; Bohnert et al., 2003; Izard et al., 2001; Trentacosta, Izard, 2007 and others). However, this relationship is expressed differently in different age groups.

As a result of correlation analysis, data showed that, in all age groups, there is a relationship between the general and emotional vocabulary of children, which is consistent with the results of L. Beck and colleagues who studied the relationships between several components of linguistic and emotional competence and showed a strong positive correlation between competencies, regardless of age (Beck et al., 2012).

The development of emotional vocabulary, passive and active in particular, according to our research, is closely related to the understanding of emotions. The work of B. Streubel and colleagues also revealed a relationship between the development of emotional vocabulary and the level of emotional competence in preschool children (Streubel et al., 2020). The size of emotional vocabulary was a strong predictor of the level of development of the ability to recognize emotions.

In order to test the hypothesis that emotional vocabulary makes a greater contribution to preschoolers' understanding of emotions compared to general vocabulary, a regression analysis was conducted. Results showed that age group, general vocabulary, and active emotion predicted children's performance on an emotion understanding test. This is consistent with the cultural-historical concept of L.S. Vygotsky that emotional development should also be mediated by a sign (Pervichko, 2016), which is most clearly manifested in the development of the child's emotional vocabulary and reflects the direct influence of speech on emotional development (Vygotsky, 2021), and with the data obtained by F. Pons and his colleagues who found that age and language ability together explain 72% of the variance in emotion understanding (Pons et al., 2004). In addition to previous studies, our results highlight the importance of emotional vocabulary for the successful development of understanding emotions at the preschool age, since it allows various emotions and emotional states to be recorded in a sign (word).

However, it is interesting to note that in both correlation and regression analyses, active emotional vocabulary had a stronger relationship with emotion understanding than passive emotional vocabulary. This result can be explained by the fact that it is the verbalisation of the emotional state that helps

to better understand and realise the emotion (Shchetinina, 1984). According to this approach, children first begin to understand the difference between their thoughts and the thoughts of another person, and only then can they verbally express their understanding (Vygotsky, 2021; Zaporozhets, 1986; Shchetinina, 1984). Our study, which showed differences in the role of active and passive emotional vocabulary, allows us to partially confirm the idea that children's correct use of emotionally specific words is more important for understanding their emotions than the volume of the emotional vocabulary.

At the same time, the contribution of general vocabulary can be explained by the fact that the success of children in performing a test for understanding emotions will depend on the general level of speech development of the child. Our assumption is consistent with the idea that the development of theory of mind and understanding of emotions is built on the basis of language as a sign system (Vygotsky, 2021; Zaporozhets, 1986; Harris et al., 2005).

Our results are consistent with data obtained by I. Grazzani and V. Ornaghi (Ornaghi and Grazzani, 2013), showing the contribution of emotional vocabulary, which was measured using the same methodology as in our study (Emotion Understanding Test), in ability to understand emotions.

However, it is necessary to highlight several limitations of the study, which can become directions for further study of the relationship between the speech and emotional spheres of preschool children. Firstly, it is necessary to expand the study sample, which should not be limited to Moscow preschoolers. Secondly, for developmental psychology it is important to study the age dynamics of the development of the speech and emotional spheres of preschool children. This requires not only the inclusion of children from other age groups, but also a longitudinal study that would allow us to track the development of vocabulary and understanding of emotions throughout the preschool period. Thirdly, it is necessary to study the influence of cultural factors (native language, national characteristics of the expression of emotions), socio-demographic factors (in particular, the level of education and financial situation of parents, the composition of the family of preschoolers), which were not taken into account in this study, but which are attracting attention in recent studies (Kyuchukov, 2022; Jabeen, Maqsood, 2023). The study did not take into account the influence of intelligence, which is noted in various studies.

Conclusions

The purpose of this study was to empirically examine the role of sign mediation in the development of emotion understanding through the re-

lationship between vocabulary size and emotion understanding at the preschool age. As a result of the analysis, we found a relationship between general vocabulary and emotional vocabulary, as well as emotion understanding at the preschool age. Moreover, depending on the age group, this relationship had its own characteristics: for both groups (children 5–6 years old and children 6–7 years old) a significant relationship was found between general vocabulary and emotion understanding, as well as between active emotional vocabulary and understanding of emotions; in the group of children 5–6 years old (senior preschool group) there is also a significant relationship between passive emotional vocabulary and emotion understanding.

Our study showed that sign mediation through vocabulary development influences the understanding of emotions at the preschool age. At the same time, with age, children's general and emotional vocabulary increases, as well as their ability to understand emotions.

There are many multidirectional connections between speech and emotional development, and therefore, as L.S. Vygotsky showed (Vygotsky, 1997), in the development and education of children it is necessary to pay attention to both aspects.

The results obtained can serve as the basis for the development of developmental programmes to improve the development of speech and emotional spheres at the preschool age.

Practical application

The results of the study can be used in educational work with parents, for whom knowledge of the relationship between speech and emotional development will help them to better understand the developmental characteristics of their children, and will be useful to educators and child psychologists in the form of an educational programme for the harmonious development of preschool children.

References

Almazova, O.V., Bukhalenkova, D.A., Veraksa, A.N., Yakupova, V.A. (2018). The Relationship between the Theory of Mind and Executive Functions in Senior Preschool Children. *Vestnik Sankt-Peterburgskogo Universiteta. Psikhologiya i Pedagogika = Bulletin of St. Petersburg University. Psychology and Pedagogy*, *8*(3), 293–311. (In Russ.)

Beck, L., Kumschick, I.R., Eid, M., Klann-Delius, G. (2012). Relationship Between Language Competence and Emotional Competence in Middle Childhood. *Emotion*, *12*(3), 503–514.

Bezrukikh, M.M., Verba, A.S., Filippova, T.A., Ivanov, V.V. (2021). Developing Speech and Socio-communicative Skills in Older Preschool Children. *Rossiiskii Psik-*

hologicheskii Zhurnal = Russian Psychological Journal, *18*(4), 5–17. (In Russ.). https://doi.org/10.21702/rpj.2021.4.1

Bohnert, A.M., Crnic, K.A., Lim, K.G. (2003). Emotional Competence and Aggressive Behavior in School-Age Children. *Journal of Abnormal Child Psychology*, *31*(1), 79–91.

Bosacki, S.L., Moore, C. (2004). Preschoolers' Understanding of Simple and Complex Emotions: Links with Gender and Language. *Sex Roles*, *50*(9/10), 659–675.

Cavadini, T., Richard, S., Dalla-Libera, N., Gentaz, E. (2021). Emotion Knowledge, Social Behaviour and Locomotor Activity Predict the Mathematic Performance in 706 Preschool Children. *Scientific Reports*, *11*(1), 1–13. https://doi.org/10.1038/s41598-021-93706-7

Cole, P.M., Armstrong, L.M., Pemberton, C.K. (2010). The role of language in the development of emotion regulation. In: S.D. Calkins, M.A. Bell, (eds.), Child development at the intersection of emotion and cognition (pp. 59–77). Washington: American Psychological Association Publ.

Cutting, A.L., Dunn, J. (1999). Theory of Mind, Emotion Understanding, Language, and Family Background: Individual Differences and Interrelations. *Child Development*, *70*(4), 853–865.

De Rosnay, M., Hughes, C. (2006). Conversation and Theory of Mind: Do Children Talk Their Way to Socio-cognitive Understanding? *British Journal of Developmental Psychology, 24*(1), 7–37. https://doi.org/10.1348/026151005X82901

Denham, S.A. (1986). Social Cognition, Prosocial Behavior, and Emotion in Preschoolers: Contextual Validation. *Child Development*, *57*(1), 194–201.

Denham, S.A., McKinley, M., Couchoud, E.A., Holt, R. (1990). Emotional and Behavioral Predictors of Preschool Peer Ratings. *Child Development*, *61*(4), 1145–1152.

Denham, S.A., Zoller, D., Couchoud, E.A. (1994). Socialization of Preschoolers' Emotion Understanding. *Developmental Psychology*, *30*(6), 928–936.

Downs, A., Strand, P., Cerna, S. (2007). Emotion Understanding in English- and Spanish-speaking Preschoolers Enrolled in Head Start. *Social Development*, *16*(3), 410–439.

Dunn, L.M., Dunn, D.M. (2007). PPVT-4: Peabody picture vocabulary test. Minneapolis: Pearson Assessments Publ.

Elkonin, D.B. (2006). Child's psychology. Moscow: Academia Publ. (In Russ.)

Fomina, T.G., Bondarenko, I.N., Morosanova, V.I. (2023). Conscious Self-Regulation, Schoolengagement and Academic Performance in Adolescents: Differential Psychological Aspect. *Vestnik Rossiiskogo Universiteta Druzhby Narodov. Seriya: Psikhologiya i Pedagogika = RUDN Journal of Psychology and Pedagogics*, *20*(3), 560–577. (In Russ.). http://doi.org/10.22363/2313-1683-2023-20-3-560-577

Gordeeva, O.V. (1995). Development of the language of emotions in children. *Voprosy psihologii,* (2), 137–149. (In Russ.)

Harris, P.L., de Rosnay, M., Pons, F. (2005). Language and Children's Understanding of Mental States. *Current Directions in Psychological Science*, *14*(2), 69–73.

Holodynski, M., Hermann, S., Kromm, H. (2013). Developmental Basis of Emotion Regulation. *Psychologische Rundschau*, *64*(4), 196–207.

Izard, C., Fine, S., Schultz, D., Mostow, A., Ackerman, B., Youngstrom, E. (2001). Emotion Knowledge as a Predictor of Social Behavior and Academic Competence in Children at Risk. *Psychological Science*, *12*(1), 18–23.

Jabeen, T., Maqsood, A. (2023). Cross-Language Validation and the Factor Structure of the Social-Emotional Competence Questionnaire for Pakistani Adolescents. *Psychology in Russia: State of the Art*, *16*(3), 189–205. https://doi.org/10.11621/pir.2023.0313

Joukova, E.S., Bogoyavlenskaya, D.B., Artemenkov, S.L. (2023). The Main Characteristics of the Intellectual and Personal Development of Today's Primary Schoolchildren. *New Ideas in Child and Educational Psychology*, *1–2*(4), 48–67. https://doi.org/10.11621/nicep.2023.0403

Kartushina, N.A., Oshchepkova, E.S., Almazova, O.V., Bukhalenkova, D.A. (2022). The Use of Peabody Tool in the Assessment of Passive Vocabulary in. *Klinicheskaia i spetsial'naia psikhologiia = Clinical Psychology and Special Education, 11*(4), 205–232. (In Russ.). https://doi.org/10.17759/cpse.2022110409

Kornilova, T.V. (2022). The Unity of Intellect and Affect in Multidimensional Regulation of Empathy. *National Psychological Journal*, *17*(1), 94–103. (In Russ.). https://doi.org/.11621/npj.2022.0108

Kyuchukov, H.S. (2022). Bilingual Children's Understanding of the Mental State of the Other Person in the Context of the Theory of Mind. *Moscow University Psychology Bulletin, 45*(4), 60–91. (In Russ.). https://doi.org/10.11621/vsp.2022.04.03

Leontiev, A.N. (1971). Needs, motives, and emotions. Moscow: Moscow Univ. Press. (In Russ.)

Liew, J., Zhou, Q. (2022). Parenting, emotional self-regulation, and psychosocial adjustment across early childhood and adolescence in Chinese and Chinese-immigrant sociocultural contexts. In: D. Dukes, A. C. Samson, E.A. Walle, (eds.). The Oxford handbook of Emotional Development. (pp. 420–436). Oxford: Oxford Univ. Press.

Lissina, M.I. (2009). Formation of a child's personality in communication. St. Petersburg: Piter Publ. (In Russ.)

Morosanova, V.I., Bondarenko, I.N., Fomina, T.G. (2022). Conscious Self-regulation, Motivational Factors, and Personality Traits as Predictors of Students' Academic Performance: A Linear Empirical Model. *Psychology in Russia: State of the Art*, *15*(4), 170–187. https://doi.org/10.11621/pir.2022.0411

Morosanova, V.I., Fomina, T.G., Bondarenko, I.N. (2023). Conscious Self-Regulation as a Meta-Resource of Academic Achievement and Psychological Well-Being of Young Adolescents. *Psychology in Russia: State of the Art*, *16*(3), 168–188. https://doi.org/10.11621/pir.2023.0312

Ornaghi, V., Grazzani, I. (2013). The Relationship Between Emotional-state Language and Emotion Understanding: A Study with School-age Children. *Cognition and Emotion*, (27), 356–366.

Pervichko, E.I. (2016). Cultural active approach to the issue of emotion regulation: theoretical explanation and empirical verification of a conceptual model. *National Psychological Journal*, *11*(2), 3–17. (In Russ.). https://doi.org/10.11621/npj.2016.0201

Pons, F., de Rosnay, M., Andersen, B.G., Cuisinier, F. (2010). Emotional competence: Development and intervention. In: F. Pons, M. de Rosnay, P. Doudin, (eds.), Emotions in research and practice, Aalborg (pp. 205—239). Denmark: Aalborg Univ. Press Publ.

Pons, F., Harris, P. (2000). Test of Emotion Comprehension—TEC. Oxford: Oxford Univ. Press.

Pons, F., Harris, P.L., de Rosnay, M. (2004). Emotion Comprehension Between 3 And 11 Years: Developmental Periods and Hierarchical Organization. *European Journal of Developmental Psychology*, *1*(2), 127–152.

Pons, F., Lawson, J., Harris, P.L., de Rosnay, M. (2003). Individual Differences in Children's Emotion Understanding: Effects of Age and Language. *Scandinavian Journal of Psychology*, *44*(4), 347–353.

Roepstorff, I.T., Mayor, J., Havighurst, S., Kartushina, N. (2022). Parents are Poor Informers of Their Young Children's Emotion Word Comprehension https://doi.org/10.31234/osf.io/zq6v8

Ruffman, T., Slade, L., Rowlandson, K., Rumsey, C., Garnham, A. (2003). How Language Relates to Belief, Desire, and Emotion Understanding. *Cognitive Development*, *18*(2), 139–158.

Sarmento-Henrique, R., Quintanilla, L., Lucas-Molina, B., Recio, P., Giménez-Dasí, M. (2020). The Longitudinal Interplay of Emotion Understanding, Theory of Mind, and Language in The Preschool Years. *International Journal of Behavioral Development*, *44*(3), 236–245. https://doi.org/10.1177/0165025419866907

Sergeyenko, E.A., Lebedeva, E.I., Prusakova, O.A. (2009). Model of mental development in human ontogenesis. Moscow: Institute of Psychology RAS Publ. (In Russ.)

Shablack, H., Lindquist, K.A. (2019). The role of language in emotional development. In: V. LoBue, K. Perez-Edgar, K.A. Buss, (eds.), Handbook of emotional development (pp. 451–478). Cham: Springer Publ.

Shchetinina, A.M. (1984). Perception and understanding of emotional states by preschool children. *Voprosy psihologii,* (3), 60–66. (In Russ.)

Solovieva, Yu., Baltazar Ramos, A.M., Quintanar Rojas, L. (2021). Experience in Pre-school Education in Mexico: Following L.S. Vygotsky. *New Ideas in Child and Educational Psychology*, *1*(1), 77–95. https://doi.org/10.11621/nicep.2021.0104

Stahl, S.A. (1999). Why Innovations Come and Go (and Mostly Go): The Case of Whole Language. *Educational Researcher*, *28*(8), 13–22.

Strayer, J. (1980). A Naturalistic Study of Empathic Behaviors and Their Relation to Affective States and Perspective-taking Skills in Preschool Children. *Child Development*, *51*(3), 815–822.

Streubel, B., Gunzenhauser, C., Grosse, G., Saalbach, H. (2020). Emotion-specific Vocabulary and Its Contribution to Emotion Understanding in 4- to 9-year-old Children. *Journal of Experimental Child Psychology*, (193), 104790.

Torres, M.M., Domitrovich, C.E., Bierman, K.L. (2015). Preschool Interpersonal Relationships Predict Kindergarten Achievement: Mediated by Gains in Emotion Knowledge. *Journal of applied developmental psychology*, (39), 44–52. https://doi.org/10.1016/j.appdev.2015.04.008

Trentacosta, C.J., Izard, C.E. (2007). Kindergarten Children's Emotion Competence as a Predictor of Their Academic Competence in First Grade. *Emotion*, *7*(1), 77–88.

Veraksa, N.E. Komarova, T.S., Vasiljeva, M.A. (eds.). (2016). From birth to school. Basic educational program of preschool education. Moscow: MOZAIKA-SINTEZ Publ. (In Russ.)

Veraksa, N.E., Djachenko, O.M. (1996). Ways to Regulate Behavior in Preschool Children. *Voprosy Psikhologii*, (3), 14–27. (In Russ.)

Veraksa, N.E., Veraksa, A.N., Gavrilova, M.N., Bukhalenkova, D.A., Tarasova, K.S. (2021). The Russian Version of the Test of Emotion Comprehension: Adaptation and Validation for Use in Preschool Children. *Psikhologiya. Zhurnal VShE = Psychology. Journal of HSE*, *18*(1), 56–70. (In Russ.)

Voltmer, K., von Salisch, M. (2022). The Adaptive Test of Emotion Knowledge for 3- to 9-year-olds: Psychometric Properties and Validity. *Frontiers in Psychiatry*, (13), 901304. https://doi.org/10.3389/fpsyt.2022.901304

Vygotsky, L.S. (1960). Development of higher mental functions. Moscow: APN Publ. (In Russ.)

Vygotsky, L.S. (1983). Foundations of defectology. Collected works: 5th ed. Moscow: Pedagogika Publ. (In Russ.)

Vygotsky, L.S. (1984). Child psychology. Collected works: 4th ed. Moscow: Pedagogika Publ. (In Russ.)

Vygotsky, L.S. (1997). Questions of child psychology. St. Petersburg: Soyuz Publ. (In Russ.)

Vygotsky, L.S. (2021). Thought and language. Moscow: AST Publ. (In Russ.)

Zaporozhets, A.V. (1986). Development of emotional regulation of actions in a child. Selected psychological works. In: V.V. Davydova, V.P. Zinchenko, (eds.), (pp. 258–259). Moscow: Pedagogika Publ. (In Russ.)

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