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Language and aggression in preschool children. Gender differences

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ABSTRACT

The present study has two objectives. Firstly to analyze the gender differences in language development in preschool children and secondly to analyze the relationships between language development on the one hand and aggression, prosocial behavior on the other hand. The study involved 155 preschool children aged between 36 and 71 months ($M = 52.61$, $SD = 10.40$) enrolled in a kindergarten in Bucharest. The instruments used were the Adaptive Behavior Assessment System, ABAS-II (Harrison et al., 2012) and Preschool Social Behavior Scale - Teacher Form (Crick, 1996). To determine the gender differences, a series of independent samples t tests and Mann-Whitney U nonparametric test were performed and for the relationships among variables, regression and moderation analyzes were performed. The results showed that girls have higher levels of language development than boys, in all measured dimensions. At the same time, the level of language development was negatively associated with physical and relational aggression and positively with prosocial behavior. Contrary to our expectations, gender has not moderated the relationship between language development and aggression or prosocial behavior. The practical implications of the study address the need to capture and treat early delays in language development in order to prevent aggressive behaviors among preschoolers.d.

Keywords: *language development, aggression, prosocial behavior, preschool children, gender differences*

1. INTRODUCTION

Language and communication development according to gender

During the preschool period, in addition to individual differences in general development, there are a number of

gender-related differences in language and speech development (Verza & Verza, 2000; Verza & Verza, 2017).

An experiment undertaken on a sample of 60 preschoolers by using image reading in order to highlight

gender-specific characteristics related to comprehension level, intelligibility and fluency of language, complexity of logical-grammatical expression, spontaneity and speed of intellectual activity, as well as the time allotted to the chronological arrangement of the set of images presented, indicated that preschool girls are superior to boys in terms of the time allotted for arranging the images in a correct order and the logical and cursive rendering of the narratives, accompanied by a higher level of affective-emotional participation (Verza & Verza, 2000; Verza & Verza, 2017). At the same time, the cited authors note the use by girls of a greater number of words and longer sentences compared to boys, which gives fluency and quality to the narratives, as girls are more active and establish relationships more easily than boys. Regarding the intelligibility, coherence and logic of preschool narratives according to gender, no significant differences were reported, but only individual characteristics related to age, while in the case of the parts of speech used, girls frequently use nouns, adjectives, verbs, conjunctions and numerals, while boys mainly use adverbs and pronouns, so that gender differences in terms of verbal behavior are manifested in the preschool period (Verza & Verza, 2000; Verza & Verza, 2017).

Boys have better math and visual skills compared to girls who develop high language skills (Santrock, 2007). The extent of gender differences in language development is although unclear, reported to certain stages of development (Etchell et al., 2018). Gender differences in language development have been a topic of great interest to researchers since the late 1950s, when the superiority of girls' language skills has been reported to the detriment of boys since childhood (Etchell et al., 2018). The view that girls have a higher level of language skills has been generally accepted, but has also been challenged, as the female and male brains have similar characteristics (Etchell et al., 2018).

Among most controversies related to the specialization of the hemispheres of the brain, there is evidence that lateralization is gender-related, beginning in the first year of life and continuing through preschool. It is shown a greater lateralization of language in the left hemisphere in boys, while in girls, the language is divided between the two hemispheres, differences that may explain the faster development of girls' language compared to boys during preschool (Feldman, 2004). Language skills appear earlier in girls because they receive more encouragement than boys, research suggests that girls speak more than boys, high levels of verbal stimulation can cause increases in certain specific areas of the brain that do not occur in boys (Feldman, 2004).

Empirical research supports the existence of positive associations between language skills and social skills, which also apply to children with language disorders (Longobardi et al., 2016). The link between language skills and social

skills varies according to the gender of children, with positive results being reported, while other studies have shown a weak association on the role of gender in language skills in the presence of poor social skills in preschool age (Longobardi et al., 2016). At the same time, it was found that girls have a rich vocabulary and express themselves through complex sentences compared to boys (Longobardi et al., 2016; Webb et al., 2020).

Children acquire knowledge about gender stereotypes, including the choice of toys and the preference for certain activities that they carry out since preschool, which can influence further development (Webb et al., 2020). Studies have consistently shown that in childhood, girls have advanced cognitive and socio-emotional skills compared to boys, and in preschool, girls have a higher socio-behavioral level, a lower prevalence of antisocial behaviors and language disorders compared to boys (Webb et al., 2020).

Gender differences in speech during preschool may be largely the result of mirrored and learned behaviors as well as cultural and linguistic characteristics, the superiority of female language skills is due to the family environment, in which mothers communicate more with girls than with boys, thus reinforcing this behavior or may be the result of early maturation of brain structures responsible for certain language functions, a functional typology that facilitates the development of language skills, while confirming conventional gender stereotypes.

Taking into account the above, we aim to check if there are gender differences in language development in preschool children in the group we analyzed. We thus establish the following hypothesis:

H1. Girls have a higher level of language development than boys.

Relationships between language development level and aggression vs. prosocial behavior in preschool children

Despite numerous studies that have addressed aggression among preschoolers, it continues to be an issue with multiple implications for children's further development. The links between childhood aggression and its consequences in later life have been highlighted by many researchers, including increased aggression itself, anxiety, depression, substance abuse, dropping out of school, conduct disorders, delinquency and crime (Kokko et al., 2006; Moffitt et al., 2002). Low levels of communication and self-regulation skills are potential risk factors involved in developing aggressive behavior. Most studies in this area have been conducted on older children, with relatively few preschoolers (Cole, 2001; Fujiki et al., 2002).

Physical aggression refers to the actual threat or injury, and relational aggression refers to emotional injury by destroying friendships or relationships with others in general (Crick et al., 2001; Linder et al., 2002). Physical aggression

is more common among boys (Moffit et al., 2001), while relational aggression is more common among girls (Ostrov & Keating, 2004). Physical aggression occurs at the end of the child's first year of life, when the child develops the motor skills needed to hit, grab, bite or push (Alink et al., 2006; Naerde et al., 2014; Tremblay et al., 1999). The frequency of acts of physical aggression reaches a peak in the period between 2 and 4 years, after which there is a gradual decrease, which lasts until adulthood (Tremblay et al., 2004, 2010). This decline coincides with the development of high-level language skills, learning to approach reality from the perspective of others, impulse control, and emotional regulation (Cole et al., 2011; Tremblay, 2010). The use of language also increases in the first year of life, so that between 12 and 24 months the child begins to retain the meaning of the language, to use an increasing number of words and expressions, starting to combine words into sentences (8-10). Vocabulary size at two years of age has been shown to be a significant and stable predictor of subsequent speech skills (Lee, 2011; Paul, 1996; Rose, Feldman, & Jankowski, 2009).

There are studies that have reported an association between externalizing problems such as aggressive behavior and speech skills, with children selected for these studies having a high level of behavioral problems, as well as language difficulties (Botting & Conti-Ramsden, 2000; Brownlie et al., 2004; van Daal, Verhoeven, & van Balkom, (2007). Since most of these studies were performed with clinical samples, which could have exaggerated the results obtained, we intend to test in this study the relationship between the aggressiveness of preschoolers and the level of language development in a group of children with typical development and without behavioral disorders or externalization behaviors (Menting, Van Lier, & Koot, 2011; Oliver, Dale, & Plomin, 2004; Plomin et al., 2002). Other population-based and nonclinic studies have focused on analyzing this relationship in older children or adolescents (Ayduk et al., 2006; Park et al., 2005), showing that there are associations between low language skills and a high level of physical aggression. These results show that even in children from non-clinical populations, the high level of aggression is associated with the low level of verbal skills.

Both reduced verbal skills and aggression are associated with long-term maladaptive consequences (Tremblay, Gervais, & Petitclerc, 2008), so that a better understanding of these relationships can contribute to the development of prevention programs that reduce the effects of such phenomena in other areas of the child's functioning.

In the present study, we discuss three models to explain the association between externalized behaviors and language development. The first model argues that underdeveloped language leads to aggressive behaviors because the child's communication skills in social situations are inappropriate (Dionne et al., 2003). This can lead to

frustration and implicit use of aggression as an alternative tool for communication. At the same time, a low level of verbal skills development may prevent the child from effectively resolving conflicts in social situations, increasing the risk of engaging in aggressive behaviors (Huaquing-Qi & Kaiser, 2004; Toppelberg et al., 2002).). This direction of association between the two constructs can be evident around the age of 3-4 years, when the child begins formal education (kindergarten), and is thus more exposed to relationships with colleagues. Longitudinal studies have supported the association between low verbal skills and aggression, from preschool to adolescence and even adulthood (Plomin et al., 2002).

The second model argues that aggression can cause delays in language development (Oliver, Dale, & Plomin, 2004; Ripley & Yuill, 2005). One of the perspectives that supports this model suggests that when children engage in acts of aggression, they will spend less time paying attention to environmental verbal stimuli (Dionne et al., 2003). This decrease in attention will limit children's learning opportunities to develop verbal skills. Moreover, parents who are more likely to address the child's aggressive behaviors will focus more on alleviating aggression and less on ways to increase the child's involvement in language learning tasks (Dionne et al., 2003).

The third model argues that there is a third variable involved in the association between aggression and language. Examples of such variables are: parenting behaviors (Barnett et al., 2012; Derauf et al., 2011; Pungello et al., 2009; Waller et al., 2012) or children's intellectual functioning (Meece & Mize, 2010; Provost, 1985; Raine et al., 2002). The association between parental behaviors and children's aggression has been intensively documented, so that negative parenting (harsh, severe) is positively associated with high levels of aggression, and positive parenting (warm, sensitive) is associated with a decrease in aggressive behaviors (Gardner et al., 2007; Waller et al., 2012). Parent-child interactions provide the child with knowledge about the outside world, the social world, and shape appropriate behavioral responses (Vagotsky, 1978).

Parental behaviors also influence children's language acquisition and development over time (Nozadi et al., 2013). For example, positive parenting can facilitate an environment in which the child is exposed to beneficial verbal experiences with a positive impact on language development and communication. From here, the child will learn to express her needs and desires, but also to understand those around her through a supportive and encouraging environment. Conversely, cold family environments can limit opportunities for verbal exchange between parent and child, which will negatively impact language learning (Asbury, Wachs, & Plomin, 2005; Hoff, 2006).

The developmental period of preschool coincides with the stage in which language develops. Aggression and language usually have an inverse proportionality, aggression following a downward trajectory, while language development follows an upward trajectory. The language-aggression hypothesis (Montare & Boone, 1973) proposes that aggression depends on a low level of verbal skills. Recent studies support this hypothesis, with delays in language development being associated with an increased level of aggression among preschoolers (Gremillon & Martel, 2014; Wang et al., 2018).

The relationship between aggression and school problems has its roots in the early association between aggression and verbal and communication deficits (Arnold, 1997). In addition, the gender and socio-economic status of the family have been shown to have important effects on this relationship. Specifically, boys are at higher risk for both aggression and poorer language development (Bradley et al., 2001). In addition, gender moderates the relationship between language development and aggression, so language is a stronger predictor of aggression among boys than girls (Stowe, Arnold, & Ortiz, 1999).

The literature has focused on physical aggression rather than relational aggression, with fewer studies in this area. However, it is assumed that there are major reasons why there are important differences between these two types of aggression and their associations with language development in childhood. Many of the strategies of relational aggression are based on speech, on spoken words. Obviously, relational aggression can also be "nonverbal", especially when children are excluded from a group through the technique of silence (Crick et al., 2002), but it is mainly based on language. Behavior specific to relational aggression includes verbal threats, verbal emotional blackmail ("I don't invite you to my birthday unless you give me your toy"), or addressing rude words, directly or indirectly (Crick et al., 1999; McNeilly-Choque et al., 1996).

Another reason that could underlie the relationship between language and relational aggression is found in the theory of mind. Thus, the child learns to attribute mental states to people, which could facilitate this type of connection (Astington & Jenkins, 1999). Verbal language develops more rapidly in girls than in boys, and girls use relational aggression more frequently than boys, which would be an additional reason to believe that such associations exist (Crick & Grotpeter, 1995). The study by Bonica et al. (2003) showed that preschoolers with a higher level of language development show a higher level of relational aggression because they have the verbal skills needed to manipulate and influence their peers. It is therefore possible that the level of language development is negatively associated with physical aggression and positively associated with relational aggression. We

establish in this sense the following hypotheses of the present study:

H2. *The level of language development is a significant negative predictor of physical aggression.*

H3. *The level of language development is a significant positive predictor of relational aggression.*

Regarding prosocial behavior, manifested in antithesis with aggression of any kind, there are numerous studies that show that an increased level of language development is positively associated with socio-emotional skills among children. For example, children with language development deficits have been shown to be less cooperative and more aggressive than their peers without language development delays (Beitchman et al., 1996; Lindsay & Dockrell, 2000). Although most studies have been performed with clinical populations of children, there are also studies involving children with typical development, which have obtained similar results. Thus, the Millennium Cohort Study conducted in 2016 showed that the level of language development of children at the age of 3 determines two years later the level of their socio-emotional competence (Girard, Pingault, Doyle, Falissard, & Tremblay, 2016). Similarly, increased verbal skills have been shown to be significant positive predictors of the development of prosocial behaviors of cooperation and emotional regulation and significant negative predictors of aggression after a period of four years (Rose, Ebert, & Weinert, 2016). Prosocial behavior has been defined as that voluntary behavior manifested with the intent to do good to another person (Eisenberg & Fabes, 1998). There are many factors that contribute to the development of prosocial behavior. Thus, the Ability Socio-Cognitive Integration Model (Beauchamp & Anderson, 2010) argues that the presence and a certain frequency of cognitive and affective skills are necessary for the occurrence and manifestation of prosocial behavior. These, in turn, are influenced by internal factors (temperament or personality), external factors (family environment or socio-economic status) and functions related to brain development and integrity. Within this model, the cognitive components that play an important role in the perception, evaluation and processing of social stimuli are: attention and executive skills (inhibition of reactions and self-regulation), communication (joint attention to others, receptive and expressive language) and socio-emotional skills (understanding of emotions, theory of mind, empathy, moral judgment).

In terms of communication, studies have shown that children's level of speech development is directly proportional to the number of positive nominations received from peers (Gertner, Rice, & Hadley, 1994). In addition, high scores on receptive language have been shown to be positive predictors of popularity among children (Dunn & Dunn, 1981). These results were later confirmed by Girard

and colleagues (2017), who showed that a higher level of language development at the age of 3 is positively associated with prosocial skills at the age of 5.

Longoria, Page, Hubbs-Tait, and Kennison (2011) reported in a study that both productive and receptive language significantly predict verbal (peer-to-peer) and nonverbal (involvement in cooperative activities) aspects of prosocial behavior. These results have a valid theoretical support that shows that it is crucial for children to understand the emotions and thoughts of those around them (expressed verbally) in order to be able to react in a prosocial manner (Gallagher, 1999; Schultz, Izard, Ackerman, & Youngstrom, 2001) and that positive relationships with others (helping colleagues, expressing compassion) are often based on verbal exchanges (Girard et al., 2016). Therefore, it seems that an underdevelopment of language will lead to the child's withdrawal, to solitary play, to avoidance of collaborative situations, and therefore to a lower prosocial behavior (Denham & Holt, 1993).

Taking into account these aspects, we aim to verify whether an increased level of language development in preschool children is positively associated with prosocial behavior and we establish the following hypothesis:

H4. *The level of language development is a significant positive predictor of prosocial behavior.*

Both physical aggression and relational aggression, as well as prosocial behavior can be affected by the interaction between language and gender. The above assertion supports the idea that different verbal skills may manifest themselves in different forms of behavior (Carson et al., 1998). A well-known assumption of Gender Socialization

Theory is that there are differences between girls and boys in terms of practices and experiences in different social contexts, with profound effects on children's behaviors toward peers and adults (Leaper & Farkas, 2015). More specifically, most experts believe that girls are socialized to show supportive behaviors, care, warmth and concern, while boys are socialized to show attitudes considered masculine, such as instrumentality, pragmatism and competitiveness (Kuhnert, Begeer, Fink, & de Rosnay, 2017).

According to this perspective, gender differences have often been reported in terms of aggression (boys scoring higher) and empathy or social behavior (girls scoring higher) (Lonigro et al., 2014; Van der Graaff et al., 2018). Previous studies have shown that gender moderates the relationship between socio-cognitive skills and externalized or prosocial behaviors (Braza et al., 2009; Longobardi et al., 2016; Stowe et al., 1999). Therefore, we will test the moderating role of gender in the relationship between the level of language development and aggression (physical and relational) and in the relationship between the level of language development and prosocial behavior. We thus establish the following hypotheses:

H5. *Gender moderates the relationship between language development and aggression.*

H5a. *Gender moderates the relationship between language development and physical aggression.*

H5b. *Gender moderates the relationship between language development and relational aggression.*

H6. *Gender moderates the relationship between language development and prosocial behavior.*

2. METHODOLOGY

The present study has a cross-sectional, differential and correlational design, aiming to examine firstly the gender differences in the level of language development in preschool children and secondly the associations between the level of language development and aggression vs. prosocial behavior according to gender.

Participants and procedure

The present study was attended by 155 preschool children aged between 36 and 71 months ($M = 52.61$, $SD = 10.40$), within a kindergarten in Bucharest, having a typical development and attending mainstream urban education. The sample consists of 78 boys (50.32%) and 77 girls (49.68%). According to kindergarten group, 52 are enrolled in the first group (33.55%), 54 in the second group (34.84%) and 49 in the third group (31.61%). Of the total number of children, 13 come from single-parent families (8.39%) and 142 from two-parent families (91.69%). Regarding the economic and occupational status of the parents, two

children have parents without occupation (13%), 25 children have parents with unqualified professions (16.13%), 38 children have parents with qualified professions (24.52%), and 90 have parents with higher education (59.22%).

We considered it appropriate to exclude from the research group preschool children who are subject to family placement or other forms of social protection, those diagnosed with autism spectrum disorder and nonverbal preschoolers. Prior to data collection, the consent of the educational institution (kindergarten) was requested, which was obtained immediately. In order to enroll the children in the research group, the parents were notified (through a special meeting organized for this purpose), who were asked to read and sign the participation agreement, the informed consent, and the consent to the use of personal data. The questionnaires were completed by educators (including the author of the study) and parents between November 2019 and January 2020, in the classroom, as a result of personal observations and their experience with

children, but also through conversations between parents and educators. The duration of the questionnaires was approximately 30 minutes for each child. This stage took place over a period of two months (because it overlapped with the winter holidays). Participation was voluntary, was not rewarded and no pressure was exerted on the enrollment of preschoolers and parents in the research project, specifying the possibility of interrupting participation at any time during the research process.

The data was collected in pencil-paper format, then transferred to Excel files. Statistical analyzes were performed using the IBM SPSS 24 program (IBM Corp, 2016) and the medmod module from Jamovi (The Jamovi project, 2020).

Instruments

In order to select appropriate methods and instruments for researching the specifics of language development and communication in preschool children, those instruments approved by the Romanian College of Psychologists were chosen, whose technical characteristics are in accordance with research standards in psychology.

Socio-demographic information was collected through a short questionnaire that included questions about gender, age and kindergarden group, parental occupation, type of family and number of children in the family.

The level of language development was measured by a number of items in the Adaptive Behavior Assessment System (Harrison et al., 2012). The Adaptive Behavior Assessment System (ABAS-II, Second Edition) provides a comprehensive assessment, with a wide applicability of use, is addressed to people aged 0-89 in order to assess adaptive skills, establish diagnosis and identify disorders in mental development, as well as in the case of monitoring progress (Harrison et al., 2012). ABAS-II is developed in accordance with the specifications of the American Mental Retardation Association, Fourth Revised Edition (DSM-IV-TR; American Psychiatric Association [APA], 2000, cited in Harrison et al., 2012). According to the cited authors, the instrument has a multidimensional character, given by the five evaluation forms that respect the chronological age and the environment of diversified origin.

ABAS-II is a comprehensive and multidimensional tool for measuring adaptive skills (Perkins-Dock, 2003). It is also a "multifunctional tool" (Harrison & Oakland, 2012, p. 1), being used for multiple purposes and measures the following areas: communication, use of community resources, functional school skills, family and educational life, health and safety, leisure, self-care, self-direction, social skills, work-related skills, grouped into three categories of adaptive domains, namely, Conceptual (communication and academic skills), Social (interpersonal skills and social skills) and Practical (independent living and skills that can be used in the daily routine), in five assessment forms: Parent /

Caregiver Form (0-5 years), Parent Form (5 -21 years), Teacher / Educator Form (2-5 years), Teacher form (5-21 years) and Adult Form (16-89 years). At the same time, ABAS-II offers separate forms for parents, teachers and adults in a multi-informed format, where respondents complete the items, the performance obtained in the activity, according to frequency (ie. always, sometimes or never) (Perkins- Dock & Robin, 2003).

In the present research, we used the Parent / Caregiver Form (0-5 years) and the Parent Form (5-21 years), to cover the three substages of preschool age (3-6 / 7 years). The following seven subdomains of interest were selected: object naming, knowing spatial positions, forming the plural, forming simple sentences, using complex sentences, using the past tense and ability to talk / listen. The scores were given as follows: 0 - the child is not able to perform the task, 1 - never or almost never when necessary does not perform the task, 2 - sometimes, when necessary, 3 - always or almost always when necessary.

Physical aggression, relational aggression, and prosocial behavior were measured by the Preschool Social Behavior Scape (Teacher Form) (Crick, 1996). The instrument comprises 23 items and measures four dimensions of social behavior, as follows: eight items for physical aggression, eight items for relational aggression, four items for prosocial behavior and three items for depressive mood. In the present study we used only 20 items, related to the first three dimensions. Examples of items: "He tries to keep his classmates from playing with other children", "He hits or pushes other children", "He says nice things to other children". Scores are offered on a five-step Likert scale where 1 - never or extremely rarely and 5 - very often or always.

The instrument was translated by us according to the accepted rules, and was then sent to a specialist for retroversion. It was used only after making the suggested corrections and after the semantic adaptation of certain items.

As research methods, the following were used:

Observation. Being used throughout our research as a framework method, it allowed the implementation of all methods of investigation, namely, conversation, interview, medical history, psychological test and questionnaire. In using this framework method, special attention was paid to both verbal and nonverbal behavior, motivational-affective expression, and how to involve and help children in tasks.

Conversation. It initially provided the opportunity to present the research project and justify the scientific nature of the whole process, in which both children and parents and educators participate, as a result of the consent given. Two forms of conversation were used, free speech and guided conversation, which provided an opportunity to capture the differential characteristics of preschoolers in language and communication, but also to make the appropriate choice for

the default answers in the selected tools. Thus, the conversation allowed to express and record all the characteristics and aspects related to the development of language and communication in preschool children, the

ways of verbal expression and logical-grammatical phrasing, as well as the appreciations regarding spending time in the family.

3. RESULTS

Descriptive statistics. Means, standard deviations, skewness and kurtosis are presented in Table 1. Cronbach

Alpha coefficients and correlations among variables are presented in Table 2.

Table 1. Means, standard deviations, skewness and kurtosis

	M	SD	Skewness	Kurtosis
Object naming	2.97	.16	-6.04	34.93
Knowing spatial positions	2.70	.57	-1.80	2.22
Forming the plural	2.52	.66	-1.17	.79
Forming simple sentences	2.82	.42	-2.20	4.19
Using complex sentences	2.40	.78	-1.00	-.05
Using the past tense	2.61	.67	-1.58	1.64
Ability to talk and listen	2.50	.70	-1.39	1.83
ABAS	18.52	3.25	-1.55	1.71
Relational aggression	14.37	7.42	.42	-1.04
Physical aggression	11.54	6.25	.92	-.08
Prosocial behavior	13.85	3.87	.18	-1.02

Table 2. Cronbach Alpha coefficients and correlations among variables

	α	AB1	AB2	AB3	AB4	AB5	AB6	AB7	ABAS	AGFI	AGRE	COPR
AB1	-	1										
AB2	-	.06	1									
AB3	-	.13	.70**	1								
AB4	-	.13	.67**	.58**	1							
AB5	-	.24**	.74**	.63**	.56**	1						
AB6	-	.21**	.81**	.70**	.72**	.68**	1					
AB7	-	.41**	.55**	.57**	.53**	.75**	.58**	1				
ABAS	.89	.29**	.87**	.83**	.77**	.88**	.88**	.81**	1			
AGFI	.98	-.01	-.24**	-.24**	-.18*	-.28**	-.21**	-.26**	-.28**	1		
AGRE	.98	-.04	-.28**	-.24**	-.20*	-.34**	-.27**	-.30**	-.33**	.89**	1	
COPR	.97	.18*	.44**	.34**	.40**	.54**	.40**	.44**	.51**	-.63**	-.66**	1

** . $p < .01$, * . $p < .05$

AB1 – Object naming, AB2 – Knowing spatial positions, AB3 – Forming the plural, AB4 – Forming simple sentences, AB5 – Using complex sentences, AB6 – Using the past tense, AB7 – Ability to talk and listen, ABAS – Language level of development, AGRE – Relational aggression, AGFI – Physical aggression, COPR – Prosocial behavior

Hypotheses testing

H1. *Girls have a higher level of language development than boys.*

To test this hypothesis, an independent samples t test was performed for six of the seven dimensions of language development, using gender as a criterion variable. For object

naming dimension, the Mann-Whitney U test was performed because, as shown in Table 1, the kurtosis is much too high, thus violating the assumption of normal data distribution. Table 3 shows the mean ranks and sum of the ranks for naming objects, and Table 5 shows the means and standard deviations for the other six language dimensions.e.

Table 3. Mean ranks and sum of ranks for object naming according to gender

	Gender	N	Mean Rank	Sum of Ranks
Object naming	Boys	78	76.03	5930.00
	Girls	77	80.00	6160.00

Table 4. Mann-Whitney U test for object naming according to gender

	Object naming
Mann-Whitney U	2849.00
Wilcoxon W	5930.00
Z	-2.01
Asymp. Sig. (2-tailed)	.04

a. Grouping variable: Gender

Table 5. Means and standard deviations for language development dimensions according to gender

	Gender	N	M	SD	SEM
Knowing spatial positions	Boys	78	2.45	.70	.08
	Girls	77	2.96	.20	.02
Forming the plural	Boys	78	2.19	.70	.08
	Girls	77	2.84	.40	.05
Forming simple sentences	Boys	78	2.68	.52	.06
	Girls	77	2.96	.20	.02
Using complex sentences	Boys	78	1.99	.85	.10
	Girls	77	2.82	.39	.04
Using the past tense	Boys	78	2.31	.80	.09
	Girls	77	2.91	.29	.03
Ability to talk and listen	Boys	78	2.10	.75	.09
	Girls	77	2.90	.31	.04
ABAS	Boys	78	16.67	3.57	.40
	Girls	77	20.39	1.19	.14

Table 6. Independent samples t test, language development differences according to gender

		F	Sig.	t	df	p	MD	SED	95% CI	
									Lower	Upper
Knowing spatial positions	Unequal variances	185.34	.00	-6.26	89.14	.00	-.51	.08	-.68	-.35
Forming the plural	Unequal variances	24.83	.00	-7.10	122.30	.00	-.65	.09	-.83	-.47
Forming simple sentences	Unequal variances	112.38	.00	-4.46	98.26	.00	-.28	.06	-.41	-.16
Using complex sentences	Unequal variances	30.02	.00	-7.88	108.42	.00	-.83	.11	-1.04	-.62
Using the past tense	Unequal variances	106.30	.00	-6.28	97.30	.00	-.60	.10	-.79	-.41
Ability to talk and listen	Unequal variances	27.01	.00	-8.65	102.46	.00	-.79	.09	-.98	-.61
ABAS	Unequal variances	74.98	.00	-8.74	94.24	.00	-3.72	.43	-4.57	-2.88

It is observed that there are differences between boys and girls, in favor of girls, in the name of objects, $M_{Boys} = 76.03$ as opposed to $M_{Girls} = 80.00$, these differences being statistically significant, $U = 2849.00$, $Z = -2.01$, $p < .05$, $d = .33$.

It is also observed that for all the language development dimensions, but also for the global level of language development (ABAS) there are differences in girls favor, these being statistically significant, as follows: for knowing the spatial positions, $M_{Boys} = 2.45$, $SD = .20$, and for girls $M_{Girls} = 2.96$, $SD = .20$, $t(89.14) = -6.26$, $CI95\%(-.68, -.35)$, $p < .01$, $d = 1.00$, for forming the plural, $M_{Boys} = 2.19$, $SD = .70$, and $M_{Girls} = 2.84$, $SD = .40$, $t(122.30) = -7.10$, $CI95\%(-.83, -.47)$, $p < .01$, $d = 1.14$, for forming of simple sentences, $M_{Boys} = 2.68$, $SD = .52$, and $M_{Girls} = 2.96$, $SD = .20$, $t(98.26) = -.46$, $CI95\%(-.41, -.16)$, $p < .01$, $d = .71$, for using of complex sentences, $M_{Boys} = 1.99$, $SD = .85$, and $M_{Girls} = 2.82$, $SD = .39$, $t(108.42) = -7.88$, $CI95\%(-1.04, -.62)$, $p < .01$, $d = 1.26$, for using the past tense, $M_{Boys} = 2.31$, $SD = .80$, and $M_{Girls} = 2.91$, $SD = .29$, $t(97.30) = -6.28$, $CI95\%(-.79, -.41)$, $p < .01$,

$d = 1.00$, for the ability to talk / listen, $M_{Boys} = 2.10$, $SD = .75$, and $M_{Girls} = 2.90$, $AS = .31$, $t(102.46) = -8.65$, $CI95\%(-.98, -.61)$, $p < .01$, $d = 1.38$, and for the global level of language development, $M_{Boys} = 16.67$, $SD = 3.57$, and $M_{Girls} = 20.39$, $SD = 1.19$, $t(94.24) = -8.74$, $95\% CI(-4.57, -2.88)$, $p < .01$, $d = 1.40$.

Given these results, it can be said that hypothesis H1 is supported by the analyzed data.

H2. *The level of language development is a significant negative predictor of physical aggression.*

H3. *The level of language development is a significant positive predictor of relational aggression.*

H4. *The level of language development is a significant positive predictor of prosocial behavior.*

To test these hypotheses, three simple linear regression analyzes were performed having as predictor the global level of language development (ABAS) and as dependent variables, alternatively, physical aggression, relational aggression and prosocial behavior, respectively.

Table 7. *Simple linear regression analysis for language development predicting physical aggression*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	95% CI	
	B	SE	β			Lower	Upper
ABAS	-.63	.15	-.33	-4.30	.00	-.92	-.34
Dependent variable: Physical aggression							
$R^2 = .11$							

Table 8. *Simple linear regression analysis for language development predicting relational aggression*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	95% CI	
	B	SE	β			B	SE
ABAS	-.65	.18	-.28	-3.65	.00	-1.00	-.30
Dependent variable: Relational aggression							
$R^2 = .08$							

Table 9. *Simple linear regression analysis for language development predicting prosocial behavior*

Model	Unstandardized coefficients		Standardized coefficients	t	Sig.	95% CI	
	B	SE	β			B	SE
ABAS	.61	.08	.51	7.34	.00	.45	.77
Dependent variable: Prosocial behavior							
$R^2 = .26$							

It is observed that language development is responsible for 11% of physical aggression variance, the regression equation being statistically significant, $F(1, 153) = 18.47$, $p < .01$. Language development is negatively and significantly associated with physical aggression, $\beta = -.33$, $B = -.63$, $CI95\% (-.92, -.34)$, $p < .01$. At the same time, language development is responsible for 8% of relational aggression variance, the regression equation being statistically significant, $F(1, 153) = 13.34$, $p < .01$. Language development is negatively and significantly associated with relational aggression, $\beta = -.28$, $B = -.65$, $CI95\% (-1.00, -.30)$, $p < .01$. It is also observed that the level of language development is responsible for 26% of the variation of prosocial behavior, the regression equation being statistically significant, $F(1, 153) = 53.92$, $p < .01$. The level of language development is significantly positively associated with prosocial behavior, $\beta = .51$, $B = .61$, $CI95\%$

$(.45, .77)$, $p < .01$.

Given these results, we can say that hypotheses H2 and H4 are supported by the analyzed data. Hypothesis H3 is

not supported by data, in the sense that language skills are negatively associated with relational aggression, and not positively, as we expected.

H5. *Gender moderates the relationship between language development and aggression.*

H5a. *Gender moderates the relationship between language development and physical aggression.*

H5b. *Gender moderates the relationship between language development and relational aggression.*

H6. *Gender moderates the relationship between language development and prosocial behavior.*

In order to test these hypotheses, three moderation analyzes were performed, having as predictor the global level of language development, as dependent variables, alternatively, physical aggression, relational aggression and prosocial behavior, respectively, and gender as a moderating variable gender.

Table 10. *Moderation estimates for gender in the relationship between language development and physical aggression*

	Estimate	SE	95% CI		Z	p
			Lower	Upper		
ABAS	-.06	.17	-.39	.28	-.34	.73
Gender	-6.48	.84	-8.13	-4.83	-7.70	< .00
ABAS * Gender	-.01	.42	-.84	.81	-.03	.98

Table 11. *Moderation estimates for gender in the relationship between language development and relational aggression*

	Estimate	SE	95% CI		Z	p
			Lower	Upper		
ABAS	.21	.20	-.18	.60	1.07	.29
Gender	-9.21	.97	-11.12	-7.30	-9.46	< .00
ABAS * Gender	.15	.49	-.80	1.10	.31	.76

Table 12. *Moderation estimates for gender in the relationship between language development and prosocial behavior*

	Estimate	SE	95% CI		Z	p
			Lower	Upper		
ABAS	.36	.10	.16	.56	3.49	< .001
Gender	2.49	.51	1.49	3.49	4.87	< .001
ABAS * Gender	-.10	.25	-.60	.40	-.40	.692

It is observed that gender does not moderate the relationship between language development on the one hand and physical aggression, relational aggression and prosocial behavior, on the other hand.

4. DISCUSSION

The present study aimed to identify the differences in language development and aggression vs. prosocial behavior in preschool children.

The descriptive analysis showed that most children have above average language development, the highest score being recorded in the for object naming, followed by forming of simple sentences, and the lowest score for using of complex sentences and for ability to talk and listen.

Through Hypothesis 1, we tested the existence of gender differences in language development. The results showed that girls have a higher level of language development than boys in all seven dimensions analyzed through ABAS-II. These results are supported theoretically, but also by empirical research conducted on different populations of preschool children.

From a biological perspective, the existence of differential brain structures and the rate of maturation indicate the advantage of girls in language development, as a result of strong left hemisphere functioning and bilateral brain activity during language processing, while strong right hemispheric laterality at boys explain their advantage for the development of spatial-visual and motor skills (Wilsenach & Makaure, 2018). Another relevant biological difference between boys and girls is related to the corpus callosum, which connects and facilitates communication between the brain hemispheres, and it is estimated that in girls, the larger surface area of the corpus callosum allows to effectively integrate auditory and visual information (Wilsenach & Makaure, 2018). At the same time, according to the cited authors, girls mature cognitively faster than boys, in other words, there is an early maturation of fine motor skills, while auditory processing capacity develops and improves earlier in girls, which means that they are able to process information faster than boys, which results in girls acquiring vocabulary faster and starting to speak earlier, an advantage that persists throughout preschool.

Research has consistently shown girls' advantage over phonological tasks, so brain imaging has shown that the two hemispheres respond differently during phonological processing tasks, so phonological information processing is lateralized in the lower left frontal region in the case of boys, while girls demonstrate patterns of bilateral activity and a stronger lateralization of the right hemisphere (Wilsenach & Makaure, 2018).

Numerous studies suggest that language acquisition is faster for girls compared to boys, but this advantage seems to disappear around the age of 6, when with the onset of school, the frequency of intervention of social factors increases and leads to future similarities in look at language skills in both girls and boys (Bornstein et al. 2004; Wallentin, 2009; Beltz et al., 2013; Lange et al., 2015).

Therefore, we can say that hypotheses H5 and H6 are not supported by the analyzed data.

From an ontogenetic point of view, girls begin to vocalize earlier, produce more sounds, use a variety of communicative and symbolic gestures, begin to speak faster, have richer vocabulary, acquire grammatical aspects of language more quickly, while also using more complex sentences compared to boys of the same age (Bornstein & Haynes, 1998; Eriksson et al., 2012; Marjanovič-Umek et al., 2016; Simonsen et al., 2014). Girls make more sounds, enrich their vocabulary quickly, use complex sentences, read earlier than boys, have a rich vocabulary and an advanced understanding of language (Jennische & Sedin, 2003; Longobardi et al., 2016; Marjanovič-Umek et al., 2016; Marjanovič-Umek & Fekonja-Peklaj, 2017; Webb et al., 2020).

Summarizing over 1,500 studies on gender, socio-emotional, and linguistic differences, Maccoby & Jacklin (1974, cited in Ma, 2019) reported that girls' verbal skills are significantly higher than boys', girls use more words to communicate than boys, who usually use simple, familiar words to express themselves, thus reducing their chances of using new words with increasing difficulty, a process that is an obstacle to their language skills. At the same time, girls outperform boys in terms of verbal fluency in language tasks (Lange et al., 2016). It has also been shown that girls outperform boys by the age of 6 months in terms of sensory discrimination of speech sounds (Pivik et al., 2011). The younger the child, the more obvious the gender differences in language development: between 8-16 months, girls outperform language comprehension, between 8-30 months in word production, and the advantage of linguistic acquisition can be seen between 1-2 years and between 2-5 years in several linguistic fields, including the production, comprehension, use of expressive language, the complexity of sentences and the speed with which vocabulary is enriched (Bornstein & Haynes, 2004; Lange et al., 2016). Gender differences in language development could be explained by faster maturation of girls compared to boys, with early maturation being correlated with high language skills (Lange et al., 2016).

Research on a Swedish sample showed a female advantage in both producing and understanding vocabulary at 18 months (Berglund et al., 2005), with similar results being obtained on a sample of Danish children (Bleses et al., 2008). At the same time, the results were similar in a study involving French-speaking Canadian children aged 8-30 months (Bouchard et al., 2009), but also in the case of a sample of German preschool children (Lange et al. 2015).

Through hypotheses H2, H3 and H4, the associations between language development and physical aggression, relational aggression, prosocial behavior were tested. The results showed that, indeed, language is a consistent positive predictor of social behaviors in preschool children. It was observed that the strongest association exists

between language development and prosocial behavior, followed by physical aggression and only then by relational aggression. These results can be explained by the fact that verbal language is rather used in a positive way, in the acts of "kindness" of children towards their colleagues, towards educators or towards family members. Hypothesis H3, through which we tested the positive association between language development and relational aggression, was not supported by data. Relational aggression is least intensely associated with language skills and, surprisingly, is associated negatively and not positively. The children in our research group come from two-parent families, with most parents having a high level of education, so it is possible for the family environment to contribute to this result. Children with poor language acquisition or underdevelopment experience a higher level of aggression, both relational and physical, and at the same time a higher level of prosocial behavior.

Families and parents that invest time and energy in raising children, who value education, who spend quality time with the child, will build healthy and desirable character traits in children. Beyond the child's adherence to printed materials - story books, boards, pictures - and implicitly to cognitive development, including language, a healthy way of interacting with others will be imprinted on him, based on correct norms and moral values. In addition to the child's predisposition to learn the language optimally, there is a great external influence, and this comes "bundled" with many other qualities, such as empathy, care for others, attention to the emotions to their needs, the desire for affiliation, the desire to help colleagues or adults, the interest in prosocial manifestations and less for aggressive, conflict-generating acts.

Our results are largely congruent with those obtained by other researchers. Thus, Longobardi, Spataro, and Rossi-Arnaud (2019) found similar results in a study in which they examined the contribution of empathy, mind theory and language in the development of prosocial behavior in children aged 8-11 years. Regarding relational aggression, other authors have found that it is positively associated with speech skills (Bonica et al., 2003). In our study, both types of aggression follow the same trajectory, being related to the low level of language development. It is possible for those children who cannot express themselves as comprehensively as their more developed peers to show aggressive behavior and try to compensate in one form or another for the inferiority complex they are likely to feel. Fearing that they will not be accepted in groups, they will resort to passive-aggressive ways to secure a place among their colleagues and friends, trying to attract their friends in any way and at any cost. They may be able to undermine the relationship between two other colleagues, even with fewer means of verbal expression, so as not to be excluded from the peer groups.

Regarding physical aggression, numerous studies have obtained similar results for all forms of language: receptive (Dionne et al., 2003; Gremillon & Martel, 2014), expressive (Extreme, 2005) and semantic (Mack & Warr-Leeper, 1992).

These results suggest that physical aggression is related to understanding the meaning of language rather than knowing its structure. The low level of language development, both in expression and in comprehension, leads to the difficulty of perception and processing of social interactions by children (Dionne, 2005). Difficulties in understanding language and using words are key factors in generating conflicts, preventing children from being avoided, as well as helping them to negotiate, cooperate or compromise. Therefore, it is not at all surprising that preschoolers with lower levels of language development have difficulties with nuanced social skills (Campbell et al., 2006). The absence of verbal means for resolving conflicts in a nonviolent way will therefore lead to the expression of aggression, both physically and relationally. Also, underdevelopment of language will prevent preschoolers from participating in group activities from which they could learn how to practice peaceful social interactions in real life, thus lacking the opportunity to observe and practice prosocial behavior (Dodge et al., 2003).

Through hypotheses H5 and H6 we aimed to test the moderating role of gender in the relationship between language development and aggression vs. prosocial behavior. The results showed that the gender fails to moderate these relationships. One of the reasons for these results could be that both boys and girls show equal physical and relational aggression, as well as prosocial behavior. Gender differences may be blurred, especially in children from families with two children of the opposite sex. Education and the family environment can improve gender differences, not necessarily in a positive way, but rather in standardizing behaviors by removing gender stereotypes. In this sense, girls can show physical aggression, just like boys, and boys can show relational aggression, just like girls.

The current social trends are to alleviate gender differences, as evidenced by the construction of unisex games and toys, similar clothing for boys and girls, the promotion of daily unisex activities. Therefore, it may be explained that the level of language development in interaction with gender is not associated with aggression or prosocial behavior.

Similarly, other authors have found that gender does not necessarily moderate the relationship between language development and prosocial behavior. Thus, Longobardi, Spataro and Rossi-Arnaud (2016) showed that among children aged 8-11, gender moderates only the relationship between mind theory and prosocial behavior, not the relationship between language skills and prosocial behavior, and only in the case of boys, not and in the case of girls. Lussier, Corrado and Tzoumakis (2012) found similar results, in which gender did not moderate the relationship between certain developmental factors and aggression, analyzing 338 children from Canadian families, aged 3-5 years.

Identifying the level of language development in children is a social "emergency". It is known that there are specific stages of development during the development period,

which must be maximized, otherwise some skills that are not learned in time, will not be able to be acquired later due to the plasticity of the brain. Language is closely related to thinking, both intertwining and acting as a system. It is welcome to identify children's communication problems and improve them in a timely manner so as not to jeopardize the child's entire cognitive and relational development.

The present study confirmed the existence of gender differences in language level. Although literature abounds in such studies, we have tried to contribute to the literature, bringing evidence in support of this idea, the results coming from a group of preschool children in Romania. In our country, such studies are rare and insufficient to create an overview of the language development of the preschooler.

The links between the level of language development and the child's behavior in the social environment were tested, by analyzing the physical and relational aggression and the prosocial behavior. With the development of language, there should be a decrease in aggression and an increase in the child's involvement in prosocial acts. During this period of life, the child acquires other tools for conflict mitigation and problem solving in the groups to which he belongs. When his verbal skills are deficitary, his "toolkit" is insufficient for a good relationship. We can therefore say that language is the basis for establishing, developing and maintaining quality interpersonal relationships, but also for the general adaptation to the environment.

The child who does not understand the spoken language well enough, who cannot express himself and who does not know the meaning of the words will encounter difficulties in relating. He will be excluded from peer groups, will isolate himself, will avoid social contexts, will experience negative emotions and, in this way, will not benefit from opportunities to learn social skills. His only weapon will become aggression, locking himself into an infantile phase in which aggression, in all its forms, will become his only tool of defense. It is therefore important to act early to identify possible delays in language development, to prevent later behavioral disorders and the general inadequacy of the child.

Regarding gender differences, although most studies suggest that gender may moderate the relationship between language development and a child's social behavior, it appears that language actually has only direct effects on aggression, but not moderating effects. If girls are considered to be more relationally aggressive and boys are more physically aggressive, it seems that this aggression has become more uniform, with boys and girls showing the same forms of aggression, obviously with more pronounced forms in boys than in girls.

Regardless of the forms of aggression shown by preschoolers, these are signs of much deeper problems, beyond language development. And these issues need to be addressed as early as possible so that precious time is not wasted in "healing" wounds that later can no longer be healed.

Practical implications

Based on the conclusions of this study, we consider that early intervention is necessary in children with language development delays. On the one hand because these delays will prevent the child from communicating effectively in the family and in other social contexts, and on the other hand because they are the starting point for many other disorders, including behavioral, emotional, and relational issues. Therefore, it is possible to develop and implement authentic courses for children's language and speech development, sessions for learning emotions, deciphering them, associating words with emotions, collaborating and cooperating with colleagues.

There are families who cannot provide their children with an educational environment that contributes to the development of speaking or social skills. Thus, much of this task goes to kindergarten and then to school. In addition to programs for children, programs can be developed for parents, including psychoeducational and parenting sessions, to guide parents in educating children, in their involvement in activities with their children, in spending quality time with them. Many parents feel that meeting their children's material needs is enough. In reality, children do not perceive these needs so acutely. They need warmth, support, accompaniment, they need to be listened to, understood, valued. They need respect from adults so that, in turn, they can learn to respect those around them.

Language and speech development can be considered a sign of education and childcare. From here derives the whole conduct: acts of kindness, generosity, attention to the feelings of others, compassion, empathy. An educated child in this sense will develop harmoniously and balanced and will learn to become a healthy and assertive adult.

Limitations and future research

One of the limitations of this study is the way in which the language assessment items were selected. Only seven dimensions of the ABAS-II scale were selected. The reason for this selection was to reduce the application time. The educators and the parents took part in completing the scales, which meant a lot of time. Even the seven dimensions chosen required 20 minutes to complete. Although we considered that we had chosen a number of dimensions that were sufficiently conclusive to assess the level of language development, other aspects may have been omitted. In our future studies we will consider the application of other, more comprehensive instruments with a wider range of indicators.

Another limitation of the study is the fact that children were recruited from a single kindergarten. They may have common features, come from similar backgrounds, so the results may not be fully generalizable. In our future studies, we will strive to attract our colleagues from other educational institutions to obtain more diverse research groups.

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