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Predictors of Social Communication in Preschool Children with Autism Spectrum Disorders

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Abstract

The present study aims to investigate the relationship between social communication and play, vocabulary and non-verbal communication in children with autism spectrum disorders (ASD). A number of 50 participants, aged between 3 and 6 years with a diagnosis of ASD, took part in the study. The data was collected through standardized questionnaires that were completed by the parents of the children: the *Assessment Protocol of Pragmatic Skills of Children with Autism Spectrum Disorder* (PAHPEA) to measure pragmatic skills and communication and *Symbolic Behavior Scales Developmental Profile Infant-Toddler Checklist* to measure play, vocabulary and non-verbal communication.

After collecting and analyzing the data, our results revealed that there is significant positive associations between social communication and play, vocabulary and non-verbal communication. After that, a regression analysis was performed, that revealed that non-verbal communication is a predictor of social communication, more precisely pragmatic skills, in children with ASD. Moreover, we also found that word comprehension could be considered a significant predictor for social communication.

Keywords: ASD, play, vocabulary, social communication

Introduction. Autism spectrum disorder

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder characterized by deficits such as lack of eye contact, stereotyped and repetitive play, absence or impaired expressive language and communication difficulties, as well resistance to new activities or environments (APA, 2013).

Symptoms of ASD are typically recognized around the second year of life (12-24 months of age), but may be seen earlier than 12 months if developmental delays are severe. Also, if the developmental delays are more subtle, symptoms can be seen even later than 24 months. Symptoms first noted include delayed language development, often accompanied by a



lack of social interest or unusual social interactions, atypical play patterns, and unusual communication patterns. ASD is also defined by restrictive and repetitive patterns of behavior, interests or activities. Stereotypic behaviors include simple motor stereotypies (hand waving, finger snapping), and repetitive behaviors may include repetitive object use (spinning coins, aligning toys) and repetitive speech (echolalia, stereotypic use of words, phrases or prosodic patterns, talking about oneself using the word "you", immediate or delayed imitation of heard words) (APA, 2013).

1. Development of social communication in children with ASD

The global development of children is influenced by the way different social contexts are perceived, by the way social interaction is carried out, because some social skills may be more appropriate in one social context, but in another social context they may be seen as inadequate (Costescu, 2021).

The ability of children with ASD to use language in communication depends very much on their cognitive development, as well as on their social development and understanding. Some children may have very limited language skills, while others may have a very developed vocabulary and the ability to approach certain topics and discuss them in detail (NIH, 2016).

In the case of children with ASD, communication is characterized by difficulties or delays in many aspects of it. They often experience difficulties with the language necessary for social interactions, in approaching appropriate social behaviors, and with social competence (Liber, Frea, & Symon, 2008). They have difficulties in identifying and maintaining the topic of a conversation, making appropriate comments and conveying subtle messages during conversations (Angeleri et al., 2016)

Pragmatics plays an important role in daily communicative exchanges as well as in social relations and is necessary for transmitting effective meanings and providing expressive means of sharing thoughts, needs and desires (Crişan, 2021). Language develops from the need to communicate with other people, which is usually the child's first socialization experience, an activity mediated by parents during everyday activities (Roberts et al., 2019).

Basic structural features of language such as phonology, syntax and grammar are less impaired in children with ASD, but the ability to use language appropriately, here referring to pragmatics, has been found to be consistently impaired (Tager-Flusberg, 2004).

According to the DSM-5, individuals with high-functioning autism may typically have more subtle difficulties with pragmatics, both in verbal and nonverbal communication. Communication difficulty, as research suggests, is more noticeable in tasks that require inferring the hidden intention behind a literal meaning of a message, as well as taking into account the specific social context in which the communication takes place (Pellegrino & Liptak, 2011).

Since the scope of pragmatics includes both verbal and non-verbal communication, abilities and difficulties in this area can be recorded regardless of language level. The existence of pragmatic deficits is therefore common to all individuals with ASD, both those who present limited speech and those who eventually acquire speech skills (Wilkinson, 1998).

2. The play in ASD

The most commonly reported play difficulties of children with autism involve spending less time in parallel and cooperative play, but also demonstrating less variability and diversity in play involving toys or other objects (Charlop, 2018). They also spend less time engaged in imaginative play or role play, which was associated with cognitive development (Toth et al., 2006).



Play often appears repetitive, sensory, isolated, concrete and unimaginative. When children with ASD use toys in their play, they often play with a very limited range of toys and use them in atypical ways, such as spinning wheels, lining up cars, waving cards, etc. (Thomas & Smith, 2004). These restrictive and repetitive play behaviors are likely to replace learning opportunities that would facilitate the acquisition of skills in other domains. A child with ASD may insist on playing the same game, the same way every time, which could limit opportunities for new experiences and alienate potential playmates (Charlop, 2018).

Limitations in the functional play skills of children with ASD become apparent in unstructured environments. When children are free to roam with little adult supervision, their play becomes dysfunctional (Sigman, Ruskin, Shoshana, Corona et al., 2014). When children play alone with blocks, puzzles, or toy cars, they are engaging in solitary play. This is a developmental phase for all children, but children with autism prefer to play alone long after the period of exploratory play is over. While typically developing children will play alongside other children, children with autism will move away from them. Play behaviors in ASD differ from those of typically developing children from the earliest stages of play, so not only is exploratory and functional play lacking, but deficits in social aspects are early predictors of children's special needs (Charlop, 2018).

3. Investigated predictors of social communication in children with ASD

3.1. The role of the game

Play is an integral part of a child's early development, leading to progressively complex social and communication skills and ultimately to friendships. While most children acquire these skills through playing with others, children with ASD have difficulties doing so (Boutot et al. 2005). In social-communicative play, the fundamental behaviors are eye contact, shared attention, turn waiting, and sharing with others, behaviors that are often lacking in children with ASD (Wolfberg et al., 2000). Sigman, Ruskin, Arbelle, Corona et al. (2014) conducted a study demonstrating that in 3–6-year-old children with autism, both functional play and symbolic play in early childhood are correlated with early language ability. Functional play has an important role in the long term, with a significant level of evolution of expressive language being observed.

An underlying reason for the difficulties encountered in acquiring play skills has not been agreed upon among researchers, but undifferentiated exploration of objects as well as functional and symbolic involvement in the use of objects are disrupted for many children with ASD disorder (Lieberman & Yoder, 2012).

These social interaction challenges point to the critical importance of teaching play skills to children with ASD in order to promote the development of friendships (Hart Barnett, 2018).

3.2. The role of vocabulary

Vocabulary, more precisely its acquisition, is an area that presents some uncertainty. The lexicon of children with ASD is similar to that of typically developing children in terms of different word categories (eg, predicates or nouns) (Charman et al., 2003, Luyster et al. 2007). Delays in the development of structural language have an early onset and present difficulties with vocabulary during the early childhood and preschool years in both expressive and receptive forms of language (Ellis Weismer et al., 2010; Luyster, Lopez, & Lord, 2007; Volden et al., 2011). Charman et al. (2003) conducted a study following reports from parents of 134 preschool children with autism in which they reported a general delay in comprehension and vocabulary production, with wide variability in language skills among children.



3.3. The role of nonverbal communication

The term "social communication" refers, in addition to verbal skills, to a set of non-verbal skills that are both socially and intentionally directed to be communicative. At the same time, it also extends to a range of behaviors, such as eye contact, facial expressiveness, vocalizations without words, gestures, as well as common affect. They are also related to the sociocognitive abilities, most of all to "Theory of Mind" (Berman, 2012).

In social interaction, behavioral deficits in nonverbal communication used for social interaction are manifested by an absent or reduced level of use of eye contact, gestures, facial expressions, body position, or speech intonation. Joint attention is an early element of ASD and individuals can learn some functional gestures, but often fail to spontaneously use expressive gestures in communication (APA, 2013).

Non-verbal communication skills in children with autism are usually impaired, such as the inability to use gestures (such as pointing to an object) to facilitate meaning in speech. Using eye contact in a conversation is often avoided, which can accentuate the idea of disinterest or inattention, but also the fact that they could seem rude (NIH, 2016).

Sigman et al. (2014), demonstrated in a longitudinal study that there are significant predictions regarding general language age, as well as expressive language age, but not receptive language age. Non-verbal communication behaviors, with the exception of initiated social interaction, have been shown to be predictive of expressive language development in children with autism.

The present study

Previous research indicates a close relationship between play and the later development of pragmatic communication skills, as well as non-verbal communication skills in relation to pragmatic skills. The present study aimed to analyze the same relationships, but it was also observed whether these skills are predictive in the acquisition of pragmatic communication skills. At the same time, the present study also analyzed the relationship between vocabulary and pragmatic communication skills and whether vocabulary plays an important role as a predictor in the acquisition of pragmatic communication skills. Therefore, our main goal is to investigate the relationship between communication skills and three possible predictors, play, vocabulary and non-verbal communication. Our research hypothesis are: a. we expect a positive association between social communication and game development; b. we expect a positive association between social communication and vocabulary, and c. we expect a positive association between social communication and nonverbal communication.

4. Methods

4.1. Participants

In order to test our hypothesis, we enrolled in our study 63 children with a diagnosis of ASD aged between 3 and 6 years. Out of which 50 met the inclusion criteria, 10 participants were female and 40 were male. The inclusion criteria were a. age between 3 and 6 years, b. the presence of an ASD diagnosis confirmed by a psychiatrist or a clinical psychologist. We have included only children without a sensory disability in our study.

The age of the participants is between 3 and 6 years, and the average age is 4.76, approximately 5 years. The participants come from both urban and rural areas, so 34 of them come from urban areas and 16 of them come from rural areas. Regarding the diagnosis, 45 have a diagnosis of ASD and 5 have a diagnosis of ASD and other comorbidities such as: ADHD,



hyperkinetic syndrome, developmental disorder, motor retardation, mild mental retardation, epilepsy.

4.2. Measuring instruments

Protocol for the Assessment of Pragmatic Abilities in Children with Autism Spectrum Disorder (PAHPEA) (Fernandes, 2021)

The protocol includes information on aspects of pragmatic performance such as: communication initiative, communication interactivity, communication means used, functional diversity and discourse skills. The proposed protocol has 29 questions that are answered on a Likert scale by a speech therapist, therapist or parent who knows and has interacted with the child for at least 3 months.

Communication and Symbolic Behavior Scale - Infant-Toddler Developmental Profile Checklist (CSBS DP Infant-Toddler Checklist)

The CSBS-DP is developed by Wetherby and Prizant (2001) and its purpose is twofold. Firstly, it aims at early identification of children who have or are at risk of developing a communication impairment, and secondly, it aims at monitoring changes in a child's communication, expressive speech and symbolic behavior over time. The checklist can be used independently or in conjunction with the other components of the CSBS-DP. The age range captures the age of functional communication between 6 months and 24 months with a chronological age of approximately 6 months to 6 years.

4.3. Procedure

Assessments were conducted on a series of 50 participants, aged between 3 and 6 years, with the aim of observing the role of vocabulary, play and non-verbal communication as predictors of social communication in children with ASD.

The social skills, especially the pragmatic skills of the participants were measured by the Protocol for the Assessment of Pragmatic Skills in Children with Autism Spectrum Disorders (PAHPEA). Participants' play, vocabulary, and nonverbal communication skills were also measured using the Symbolic Behavior and Communication Scale - Infant-Toddler Developmental Profile Checklist (CSBS DP Infant-Toddler Checklist).

Data were collected both online and in hard copy using a form. The form was completed by both parents and therapists, of whom 39 were parents and 11 were therapists. The questions were divided into 3 sections. The first section included demographic questions that captured diagnosis, age, sex, background. The second section included the 29 items from the PAHPEA, and the third section included the 24 items from the CSBS-DP. The collection period is from February to June 2022.

In the online environment, the form was distributed to the groups of parents belonging to children with ASD, as well as to groups in which there were specialists in the field of Special Psychopedagogy and Psychology. 47 participants completed the form, and following inclusion and exclusion criteria, 34 took part in this study. At the same time, 16 forms were physically distributed to an association in Sighetu-Marmației and a kindergarten in Cluj-Napoca, and following inclusion and exclusion criteria, 16 took part in this study. All participants in this study consented to participation and data collection.

4.4. Data analysis

To observe the relationship between the investigated predictors (vocabulary, play and non-verbal communication) and the development of social communication, more precisely pragmatic skills, the collected data were entered into SPSS and statistical analysis was carried



out based on the Pearson correlation test and the regression function. Results from the Protocol for the Assessment of Pragmatic Abilities in Children with Autism Spectrum Disorder (PAHPEA) and the Symbolic Behavior and Communication Scale – Infant-Toddler Developmental Profile Checklist (CSBS DP Infant-Toddler Checklist) were compared, to observe how the social development of children with autism is influenced by the above mentioned predictors.

4.5. Results

Demographic data such as age, gender and background of the participants are presented in Table 1. The minimum age is 3 years, and the maximum age is 6 years, with the average being approximately 5 years (4.76). Participants are both male and female, 40 out of 50 participants are male and 10 are female. The environment of origin is urban for 34 participants and rural for 16 participants.

Table 1. Descriptive analysis regarding participant demographics

	Nr. participants	Minimum	Maximum	Mean	Standard deviation
Age	50	3	6	4.76	1.153
Sex	50	1	2	1.20	.404
Mediu	50	1	2	1.32	.471

The mean scores of the CSBS subscales and the Pragmatic Skills Assessment Protocol Total score are shown in Table 2. Also in this table are the minimum, maximum scores and standard deviations. As for the Pragmatic Skills Assessment Protocol, it consisted of 29 items that ranged from 1 to 5 points each. Higher scores indicated better development of pragmatic skills, while lower scores indicated poorer development in pragmatic skills. The average score is 72.50, the minimum score obtained being 44, and the maximum score 124.

Table 2. Descriptive analysis of CSBS subscale scores and Pragmatic Skills Assessment Protocol

	Nr. participants	Minimum	Maximum	Mean	Standard deviation
Pragmatic skills assessment protocol Total	50	44	124	72.50	17.674
Scale of communication and symbolic behavior (CSBS) Total	50	8	57	36.32	12.515
Subscale of emotion and eye gaze (CSBS)	50	2	8	5.94	1.583



Subscale of communication (CSBS)	50	0	8	4.24	2.209
Subscale of gestures (CSBS)	50	0	10	5.72	2.935
Subscale of sounds (CSBS)	50	1	8	5.46	2.426
Subscale of words (CSBS)	50	0	6	2.94	2.334
Subscale of understanding (CSBS)	50	0	6	3.72	1.830
Subscale of object use (CSBS)	50	2	11	8.30	2.443

At the CSBS, the subscales tracked were: Gestures Subscale, Words Subscale and Object Use Subscale. The gestures subscale included 5 items that ranged from 0 to 2 points each, thus the maximum possible score was 10. The average score for this subscale is 5.72, the maximum score is 10 and the minimum score is 0. The words subscale consisted of 2 items, so the score for the first item ranged from 0 to 2, and for the second item ranged from 0 to 4. The maximum possible score was 6. The average score was 2.94, the maximum score is 6 and a minimum score of 0. The object use subscale consisted of 4 items (2 with scores from 0 to 2, one with a score from 0 to 3 and one with a score from 0 to 4) and with a maximum score of 11. The average score is 8.30, a maximum score of 11 and a minimum score of 2.

Based on the Pearson correlation test, associations were made between the total score from the Pragmatic Skills Assessment Protocol and the 3 subscales targeting the 3 investigated predictors (game, vocabulary and non-verbal communication), respectively the subscales from the CSBS that measure the use of objects, words and gestures. Following the correlational analysis of the data, positive, significant associations were found between pragmatic communication skills and the 3 predictors above (Table 3).

Table 3. The association between social communication and the 3 investigated predictors: game development, vocabulary and non-verbal communication

Measures	1.	2.	3.	4.
1. Pragmatic skills assessment protocol Total	1			
2. Subscale of object use (CSBS)	.589**	1		
3. Subscale of words (CSBS)	.397**	.572**	1	
4. Subscale of gestures (CSBS)	.648**	.689**	.474**	1

* $p < .05$; ** $p < .01$



Regarding the association between pragmatic communication skills and gaming skills, a significant positive correlation was found between the two ($r = .589, p < .001$). The results also indicate a positive association between pragmatic communication skills and vocabulary use ($r = .397, p < .005$). At the same time, following the analysis of the results, there is also a significant positive association when we look at pragmatic communication skills in relation to the use of gestures ($r = .648, p < .001$).

Pearson's bivariate correlations revealed that the relationships between pragmatic skills and the 3 investigated predictors (play, vocabulary, non-verbal communication) were in the expected direction.

After the discovery of these associations between communication skills and the 3 investigated predictors (the role of play, vocabulary and non-verbal communication) a regression analysis was also carried out to investigate whether play, vocabulary and non-verbal communication could significantly predict development of communication skills in children with ASD. The results can be found in Table 4.

Table 4. Regression analysis of communication skills and the 3 investigated predictors

	B	Standard error	Beta	Sig.
Constant	40.740	7.020		.000
Subscale of gestures (CSBS)	2.743	.910	.455	.004
Subscale of object use (CSBS)	1.843	1.174	.255	.123
Subscale of words (CSBS)	.263	1.011	.035	.796

Following the regression analysis, the model indicates $R = .6772, R^2 = .459$, adjusted $R^2 = .423$. It was found that, regarding the 3 investigated predictors, non-verbal communication, measured with the CSBS Gestures Subscale, is a significant predictor in the development of communication skills $F(3, 46) = 12.994, p < .001$. Thus, the Gestures Subscale, which captures, through its items, nonverbal communication, is a significant predictor ($B = 2.743$; Standard error = .910; Beta = .455; $p < .001$).

At the same time, the regression analysis was performed for the other CSBS subscales to observe the relationships between them and the communication skills measured with the PAHPEA. Following the results, it was found that the communication skills that capture aspects such as shared attention, measured with the Communication Subscale and the comprehension skills of words and expressions, measured with the Comprehension Subscale, represent significant predictors in the development of communication skills, measured with the PAHPEA, in children with ASD. The results are presented in Table 5.

Following the a posteriori analyses, the regression model indicates $R = .7442; R^2 = .553$; Adjusted $R^2 = .514$. It was found that communication skills with aspects of shared attention, measured with the Communication Subscale of the CSBS, represent a significant predictor in the further development of communication skills. At the same time, the comprehension of words and expressions, measured with the Comprehension Subscale from the CSBS, following the results, showed that this is also a predictor in the development of communication skills in children with ASD $F(4, 45) = 13.940, p < .001$. Thus, communication skills with aspects of shared attention ($B = 3.550$, Standard Error = 1.059, Beta = .444, $p < .001$) and comprehension of words



and expressions ($B=3.650$, Standard Error= 1.316 , Beta= $.378$, $p<.001$) are significant predictors of the development of pragmatic communication skills.

Table 5. Regression analysis of communication skills and the other subscales of the CSBS-DP

	B	Standard error	Beta	Sig.
Constant	38.176	7.050		.000
Subscale of emotion and eye gaze (CSBS)	1.956	1.491	.175	.196
Subscale of communication (CSBS)	3.550	1.059	.444	.002
Subscale of sounds (CSBS)	-1.085	.970	-.149	.269
Subscale of understanding (CSBS)	3.650	1.316	.378	.008

Conclusions

This study aimed to investigate the relationship between communication skills and 3 possible predictors (play, vocabulary, non-verbal communication) of these skills, in children with ASD aged between 3 and 6 years. The results revealed significant positive relationships between the targeted predictors, more precisely play skills, vocabulary and non-verbal communication and pragmatic communication skills in children with autism. Following the results, it was found that non-verbal communication skills, measured with the Gestures Subscale of the Communication and Symbolic Behavior Scale (CSBS) represent a predictor for communication skills in young children with autism. Also, significant positive associations were found between all 3 possible investigated predictors and pragmatic communication skills.

The results of the present research demonstrated a significant positive relationship between play skills and communication skills in children with, thus, the hypothesis established in relation to play and social skills was found to be confirmed and thus, the development of play is associated with communication skills social in children with autism.

Regarding vocabulary, a significant positive association was found between children's vocabulary and pragmatic communication skills. Following the results, we can find that the hypothesis established in relation to vocabulary and communication skills has been confirmed and, thus, vocabulary is associated with communication skills in children with autism.

The investigation of the relationship between non-verbal communication and pragmatic communication skills revealed results targeted in the hypothesis, thus, a significant positive association was found between the two. Furthermore, following the regression analysis, it was found that non-verbal communication skills are a predictor for pragmatic communication skills in young children with autism. Non-verbal communication behaviors are thus predictive of the development of pragmatic language in children with autism.

Although a significant positive association was found between the 3 possible targeted predictors, following the regression it was revealed that game and vocabulary are not predictors for the development of communication skills, thus only non-verbal communication is a predictor for pragmatic communication skills in children with ASD.



Also, an a priori analysis was carried out to observe if other elements of the CSBS could represent predictors in the development of pragmatic communication skills. Following the results, it was revealed that word comprehension abilities and abilities to use some subtleties of communication (such as maintaining or attracting the interlocutor's attention) are predictors of pragmatic communication abilities.

The present research aimed to investigate the relationship between communication skills and three possible predictors (play, vocabulary and non-verbal communication). Communication skills were measured with the PAHPEA, and the three predictors with the CSBS Infant-Toddler Checklist. The research hypotheses were confirmed, thus positive relationships were identified between pragmatic communication skills and the three predictors. Moreover, it was found that non-verbal communication skills are a predictor for the development of pragmatic communication. At the same time, following an a priori analysis, it was revealed that the abilities to understand words and the abilities to use some subtleties of communication (such as maintaining or attracting the interlocutor's attention), measured with the CSBS, are predictors of pragmatic communication skills.

Following the results, we can conclude by highlighting the fact that social communication is closely related to play, vocabulary and non-verbal communication. The latter, more precisely, non-verbal communication, is even a predictor in the further development of pragmatic skills in children with autism.

Limitations of the study

A first limitation of the study is the inclusion criterion of participants who present, in addition to ASD, comorbidities. In addition to the diagnosis of ASD, 5 children who participated in the study also had other comorbidities, such as: epilepsy, ADHD, hyperkinetic syndrome, mild mental retardation, developmental disorder, motor retardation. This may have influenced the results to some extent, so the non-selection of children presenting only the targeted diagnosis could have influenced the research.

A second limitation could be represented by the subjectivity of the parents. Regarding the completion of the scales, parents could be tempted to overestimate their children and, thus, the answers to the items were given according to what the parent observes in the child from their own perspective, subjectively, without looking at the picture of whole and in estimating the answers according to the actual abilities of the child.

Another limitation of the study is given by the non-introduction of tools that target more deeply, through several items, the 3 targeted predictors: play, vocabulary and non-verbal communication. The communication and symbolic behavior scale includes a small number of items that measure the 3 predictors investigated in this research, so it was not possible to analyze in a more in-depth and detailed way the game behavior, vocabulary and non-verbal communication in this sample of children.

Future directions

This research aimed to investigate the relationship between communication skills and the 3 targeted predictors: the role of play, vocabulary and non-verbal communication. Significant results were revealed regarding these predictors, so the hypotheses were confirmed and the research took the expected direction. However, there are some things that deserve to be further explored.

Numerous researches have highlighted the fact that play is closely related to communication skills in children with ASD (Mundy et al. 1987; Sigman et al. 2014). Using



scales that primarily capture children's play skills might capture in more detail how play influences the later development of these skills. At the same time, the present research collected data over a short period of time, both from therapists and from parents, data that could have had an increased level of subjectivity on the part of parents, the major percentage of those who completed being represented by parents. Conducting a longitudinal study that captures children with autism in play behaviors and subsequently how these individual play skills are reflected in the development of pragmatic communication skills could reveal significant results.

Since the game offers many opportunities for communication and vocabulary development within it, it is desirable to investigate, in future studies, the relationship between game skills and pragmatic communication skills in a larger and more meaningful sample, more well targeted, which does not include other comorbidities and within which to try to reduce subjectivity on the part of the relatives. Also, the use of more complex scales to measure play skills, as well as the implementation of a longitudinal study, could be a goal for the future to investigate in a deeper way the role of play as a predictor of communication skills in children with the disorder from the autistic spectrum.

Following the a priori analysis of the results, two predictors of communication skills in children with autism spectrum disorder were identified. Comprehension of words and the use of subtleties of communication are predictors for the development of communication skills in young children with autism, so conducting studies aimed at how these predictors associate and influence communication skills is to be considered in what regards future studies.

Therefore, we can conclude that the more in-depth investigation of play as a predictor of communication skills, as well as the investigation of the predictors discovered following the a priori analysis, can be considered in terms of future studies.

Practical implications

The results of this study revealed that there is a significant positive association between vocabulary and play and pragmatic communication skills. At the same time, non-verbal communication, word comprehension, and subtleties in communication, measured with the CSBS-DP, are predictors in the development of communication skills in children with autism.

These results are based on a sufficiently significant sample in number, which ensures the applicability of the findings. The results could represent additional knowledge about how the pragmatic communication skills of children with autism are influenced by the 3 discovered predictors, so that an early intervention protocol targeting the 3 predictors could be implemented. Through this early intervention protocol, intervention would be ensured in terms of the 3 predictors and at the same time, the intervention can be carried out in the form of play activities, since a significant, positive relationship was found between play and communication skills, and play can provide a framework in which the child can face diverse communication experiences.

At the same time, the results could also be used to create a guide for parents in which different concepts are explained and in which various activities can be found that the parent can do together with the child at home. This guide would ensure the continuity needed to reinforce the skills the child has learned in the intervention activities

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