Using Pragmatic Language Profiles to Support Differential Diagnosis in Children with Developmental Language Disorder and Autistic Children

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Abstract

Developmental Language Disorder (DLD) and Autism share some common features in language development, often making the diagnostic distinction between the two disorders particularly challenging (Hage et al., 2022). These overlaps may lead to diagnostic ambiguity, affecting diagnostic accuracy (Andreou et al., 2022). Although pragmatic difficulties have been documented in both populations, significant differences between the two populations have been observed (Hage et al., 2022). The aim of the present study is to investigate whether the assessment of pragmatic skills could contribute to the differential diagnosis of Greek speaking autistic children and children with DLD. 25 children with DLD (Mean age=84.09 months) and 25 autistic children (Mean age=84.19 months), matched for chronological age and gender participated in the study. Pragmatic skills were examined using the Greek version of Children's Communication Checklist-2 (CCC-2, Bishop, 2003; Georgiou & Spanoudis, 2021). Specifically, the following scales of CCC-2 were used: Coherence, inappropriate initiation, stereotyped language, use of context, non-verbal communication, social relations and interests. Results showed significant differences across most measures with autistic children generally scoring lower than DLD children. The findings are examined in the context of diagnostic differentiation between the two populations. Pragmatic language, and in particular the pragmatic abilities in which differences are observed between the two groups, could potentially function as discriminative markers between the disorders. Consequently, the assessment of pragmatic skills, in combination with other diagnostic measures, may contribute to achieving more complete and accurate diagnoses.

Keywords: *Autism, DLD, pragmatic language*

1. Introduction

1.1 Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is characterized by persistent difficulties in social communication and social interaction across multiple context as well as restricted and repetitive (stereotypical) patterns of behaviour, interests and activities (APA, 2013). There is a high degree of heterogeneity in the language development of children with ASD. A percentage of children with ASD do not experience language difficulties, while other children are characterized as nonverbal, as they do not develop expressive or functional speechη (Luyster & Lord, 2009; Norrelgen et al., 2014). Many children also experience delays in language development (Herlihy et al., 2015). Children with ASD and language difficulties mainly present difficulties in receptive speech and language comprehension (Volden et al., 2011; Zhou et al., 2018). In terms of pragmatic development, pragmatic abilities of children with ASD are significantly lower than those of their typically developing peers. In particular, weaknesses are already apparent in infancy, but as the child grows older, these weaknesses seem to become more intense (Papoudi & Kossyvaki, 2018). Furthermore, pragmatic difficulties are also observed in children with ASD without language difficulties (Baixauli-Fortea et al., 2019; Tager-Flusberg, 2006). More specifically, children with ASD present difficulties in conversational abilities, inference abilities and social reciprocity (Georgiou & Spanoudis, 2021; Lam, 2014).

1.2 Developmental Language Disorder

Developmental Language Disorder (DLD) is characterized by persistent deficits in language acquisition, as well as in understanding, production and use of language (spoken or signed) (World Health Organization, 2019), causing significant limitations in the individual's ability to communicate. Language difficulties are the main characteristic of children with DLD as language development is slower compared

to that of their typically developing peers and these deficits are evident not only in childhood but also in adulthood (Davies et al., 2016).
Language difficulties are observed at all levels of language development and mainly in the production and comprehension of spoken language. In addition, difficulties are identified in reading skills and written language production (Andreou & Aslanoglou, 2022; Aslanoglou, 2023). Regarding pragmatic language, children with DLD also exhibit difficulties, which are probably more related to difficulties in structural language rather than to deficits in social knowledge (Andreou et al, 2025c; Davies et al., 2016). Pragmatic difficulties of children with DLD are mainly found in inference (Andrés-Roqueta & Katsos, 2020; Jones & Westermann, 2021), in conversational abilities (Andreou, Lymperopoulou & Aslanoglou, 2025a) and in understanding and using idiomatic language and figurative expressions (Vulchanova et al., 2019).

1.3 Commonalities and Differences between ASD and DLD in Pragmatic Language

DLD and ASD share some common features in language development, which often makes the differentiation between the two disorders particularly challenging (Hage et al., 2022). These overlaps may lead to diagnostic ambiguity or even confusion, affecting the accuracy and validity of the diagnosis (Andreou et al., 2022; Hage et al., 2022; Norbury et al., 2004). Although difficulties in pragmatic abilities have been documented in both individuals with ASD and DLD, pragmatic language is a linguistic level where significant differences between the two populations are evident (Hage et al., 2022; Schaeffer, 2018). The differences in pragmatic difficulties between the two populations mainly concern the nature of their deficits. Specifically, children with ASD have difficulties in pragmatic abilities related to both structural language (linguistic pragmatics) and Theory of Mind, such as social reciprocity (social pragmatics) (Andreou et al., 2025c; Andrés-Roqueta et al., 2017). In contrast, children with DLD have difficulties in pragmatic skills related to language (linguistic pragmatics), while pragmatic abilities related to Theory of Mind (social pragmatics) appear comparable to those of typically developing children, with any observed differences being minimal (Andreou et al., 2025c; Ferrara et al., 2020).Given these differences, the investigation of pragmatic skills could contribute substantially to the differential diagnosis of the two disorders by acting as a discriminative diagnostic marker (Andreou et al., 2022).
According to the above, the aim of the present study is to investigate whether the assessment of pragmatic skills could contribute to the differential diagnosis of Greek speaking autistic children and children with DLD. Therefore, the following research hypotheses have been set:
1) It is expected that children with ASD will exhibit greater difficulties in pragmatic language abilities compared to children with DLD.
2) It is expected that children with ASD will exhibit greater difficulties in social reciprocity compared to children with DLD.

2. Method

2.1 Participants

The sample of the study consisted of 50 Greek-speaking students. More specifically, 25 children with ASD (mean age = 84.19; mean non-verbal intelligence= 89.80) and 25 children with DLD (mean age = 84.09; mean non-verbal intelligence = 88.20). Both groups comprised seventeen boys and eight girls and were matched on gender and chronological age. All participants attended either general or special schools in Greece and recieved individualized intervention programs, including speech and language therapy, occupational therapy, and special education support.
For the initial group allocation, the participants' official diagnoses issued by public state services, such as the Centers for Multidisciplinary Assessment, Counseling, and Support (KEDASY), were taken into consideration. Subsequently, all participants were administrated the Greek version of the Raven's Coloured Progressive Matrices (Sideridis et al., 2015), and the Mean Length of Utterance -word (MLUw) was calculated (Rice et al., 2010).
The inclusion criteria for participation required that children be aged between 6 and 8 years old, have Greek as their first language and be monolingual, and have a non-verbal intelligence score of 85 or above as measured by the Greek version of the Raven's Coloured Progressive Matrices (Sideridis et al., 2015). In addition, participants were required to have an MLUw score of 4.0 or higher and no comorbid psychiatric to developmental disorders or sensory impairments, based on their official diagnoses. Participants in the ASD group had received an official diagnosis for Autism Spectrum

Disorder, High-Functioning Autism, or Atypical Autism, whereas participants in the DLD group had received an official diagnosis for language problems/deficits that compose the profile of DLD (Table 1).

Table 1. Means and Standard Deviations of Age, Non-verbal Intelligence and MLUw of the participants

	DLD[a]		ASD[b]	
	M	**SD**	**M**	**SD**
Age (months)	84.09	6.72	84.19	6.55
Non-verbal intelligence	88.20	4.54	89.80	4.203
MLUw[c]	4.37	0.099	5.79	0.82

[a] DLD=Developmental Language Disorder,
[b] ASD= Autism Spectrum Disorder,
[c] MLUw= Mean Length of Utterance (word)

2.2 Procedure

The study employed a non-probability sampling method, and specifically convenience sampling, due to the limited availability of the target populations (Etikan et al., 2016). Also, there was a predetermined time frame for the research, which precluded the use of random sampling techniques. Assessments were conducted individually by the researcher in a quiet setting at the school or educational center, typically across two or three sessions, with each child completing the full procedure in approximately 90 minutes. Non-verbal intelligence was evaluated using the Greek version of the Raven's Coloured Progressive Matrices (Sideridis et al., 2015), and language production was assessed by calculating the MLUw through spontaneous conversation.

2.3 Measures

The Greek version of Children's Communication Checklist -2 (Bishop, 2003; Georgiou & Spanoudis, 2021) was used in the research in order to evaluate pragmatic language abilities of participants. It is the Greek adaptation of the Children's Communication Checklist-2 (CCC-2; Bishop, 2003) and includes 70 questions for children aged 4–16 years, completed by parents or teachers who have known the child for at least six months. The questions are divided into ten subscales that assess structural and pragmatic aspects of communication, specifically speech, syntax, semantics, coherence, inappropriate initiation, stereotypical language, use of context, nonverbal communication, social relationships, and interests.
In the current study, the subscales related to pragmatic skills were used. Specifically, the scales of Coherence, Inappropriate Initiation, Stereotypical Language, Use of Context, Nonverbal Communication, Social Relationships, and Interests were examined. The subscales Coherence, Inappropriate Initiation, Stereotypical Language, Use of Context, Nonverbal Communication constitute pragmatic language abilities. In addition, the last two subscales are combined to form the composite index of Social Reciprocity. Raters are asked to assess the frequency of specific linguistic, pragmatic, and social behaviors using a four-point scale ranging from "never or rarely" to "very often/always."

2.4 Data Analysis

Data analysis was conducted using IBM SPSS statistics. Initially, descriptive statistics were calculated for all study variables. Group differences between children with ASD and children with DLD were examined using independent sample t-tests.

3. Results

Independent T-test analysis was performed to compare the two groups. Table 2 presents the descriptive data on the performance of the children in both groups on pragmatic language abilities, as well as the statistical significance between the groups on this measurement.
The analysis conducted to compare pragmatic abilities of children with ASD and those with DLD showed that there was a statistically significant difference (p<0.001) in pragmatic language abilities between DLD (M=28.44, SD=2.47) and ASD (M=24.08, SD=4.97) (Table 2). Table (3) presents the mean scores and between-group differences for each pragmatic language subscale of the CCC-2 (Bishop, 2003; Georgiou & Spanoudis, 2021).
The analysis comparing social reciprocity of children with ASD and children with DLD revealed that there was a statistically significant difference (p<0.001) regarding social reciprocity between the groups (ASD

M=-7.08, *SD*=9.35; DLD *M*=7.16 *SD*= 7.16) (Table 2). Table (3) presents the mean scores and between-group differences for each social reciprocity subscale of the CCC-2 (Bishop, 2003; Georgiou & Spanoudis, 2021).

Table 2. Performance of DLD and ASD groups in pragmatic language and in social reciprocity.

	ASD[a] (*n*=25)		DLD[b] (*n*=25)		*p*	t-test
	M	**SD**	**M**	**SD**		
Pragmatic Language	24.08	4.97	28.44	2.47	**<.001***	3.93
Social Reciprocity	-7.08	9.35	7.16	7.16	**<.001***	6.05

[a]. DLD=Developmental Language Disorder,
[b]. ASD= Autism Spectrum Disorder,
* p< .05

Table 3. Performance of DLD and ASD groups in subscales of CCC-2.

	ASD[a] (*n*=25)		DLD[b] (*n*=25)		*p*	t-test
	M	**SD**	**M**	**SD**		
Coherence	5.48	2.90	3.36	.81	**<.001***	-3.52
Inappropriate Initiation	5.36	.95	6.68	1.49	**<.001***	3.73
Stereotypical Language,	5.88	1.45	7.76	1.59	**<.001***	4.37
Use of Context	5.08	1.26	6.92	2.20	**<.001***	3.64
Nonverbal Communication	2.28	1.14	3.72	.98	**<.001***	4.80
Social Relationships	.40	.96	1.20	2.10	.09	1.73
Interests	3.80	.87	5.88	2.05	**<.001***	4.68

[a]. DLD=Developmental Language Disorder,
[b]. ASD= Autism Spectrum Disorder,
* p< .05

4. Discussion

According to the first hypothesis, it is expected that children with ASD will exhibit greater difficulties in pragmatic language abilities compared to children with DLD. The results of the study indicated lower performance for children with ASD as compared to children with DLD in pragmatic language abilities and are consistent to previous research that compared the two populations on pragmatic language skills. More specifically, Hage et al. (2022) reported greater pragmatic difficulties in children with ASD in comparison to children with DLD, based on a questionnaire completed by teachers and parents. In addition, Ferrara et al. (2020) found lower performance in pragmatic language abilities for children with ASD in comparison to children with DLD using CCC-2 (Bishop, 2003). Finally, Andreou et al. (2025c) examined pragmatic language in Greek-speaking children with ASD and DLD and concluded that, although both groups demonstrated pragmatic impairments, pragmatic difficulties were more pronounced in children with ASD than in children with DLD. The first hypothesis was confirmed reinforcing previous findings regarding pragmatic language in DLD and ASD.

The second hypothesis states that it is expected that children with ASD will exhibit greater difficulties in social reciprocity (social relations and interests) compared to children with DLD. The findings of the present study showed that children with ASD scored significantly lower on the Social Reciprocity scale compared to children with DLD. This result was expected, as this particular scale of the CCC-2 (Bishop, 2003) has been documented as particularly sensitive in distinguishing between children with structural language difficulties and children whose pragmatic deficits exceed the level of their structural language skills, a characteristic often observed in the ASD population (Bishop & Baird, 2001; Norbury et al., 2004). The results are consistent with previous research findings, which indicate that children with ASD have greater difficulties in social reciprocity than children with DLD. In particular, de la Torre Carril et al., (2021) examining pragmatic language profile of children with ASD and DLD using CCC-2 (Bishop, 2003) found that children with DLD did not present difficulties in social reciprocity, while the performance of children with ASD was significantly lower than that of children with DLD in this task. In addition, Ferrara et al., (2020) using also CCC-2 in these two populations reached similar results. Finally, Georgiou and Spanoudis in a study regarding Greek-speaking children with DLD and ASD found also lower

performance for children with ASD as compared to children with DLD in social reciprocity. Thus, the results of the present study confirm the second research hypothesis and add further empirical data supporting the claim that children with ASD present more difficulties in social reciprocity as compared to children with DLD.

5. Conclusion

This study examined and compared the pragmatic profiles of children with ASD and children with DLD. The findings are consistent with previous research on the pragmatic abilities of the two populations. The differences identified in their pragmatic profile highlight pragmatic language as a possible factor in distinguishing the two disorders, underscoring the importance of its systematic assessment in the diagnostic process.

In particular, the differences observed in specific dimensions of pragmatic language support the view that, despite superficial similarities between ASD and DLD, the underlying linguistic and pragmatic deficits are not identical. In children with ASD, difficulties seem to be more related to social reciprocity and the use of language in a social context, while in children with DLD, limitations are mainly found in structural aspects of language (Andreou et al., 2025b).

Consequently, the integration of pragmatic skills assessment, in combination with measures of structural language assessment may contribute significantly to diagnostic accuracy and clearer differentiation between the two disorders. At the same time, these findings have practical implications for the design of targeted interventions tailored to the specific communication profile of each group.

Finally, this study has certain limitations that should be taken into account when interpreting the findings. First, the relatively small sample size limits the ability to generalize the results to the broader population of children with ASD and DLD, as it may not fully reflect the heterogeneity that characterizes the two groups. Furthermore, the limited age range of the participants does not allow for the investigation of possible developmental differences in pragmatic abilities. Future research with larger and more age-diverse samples could offer more reliable and generalizable conclusions.

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