PROSODIC ABILITIES IN AUTISM

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Introduction

Prosodic systems (e.g., prosodic structure, intonation, and rhythm) play a key role in spoken language. These systems mediate the phonetic substance of speech within a wide range of communicative functions, and atypical prosodic patterns generally act as significant barriers to communication, and may also affect the process of language acquisition. Thus, prosodic abilities have attracted researchers' attention in a large number of clinical populations with language and communicative impairments, such as autistic spectrum disorder. Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by social communication impairment and restricted interests or repetitive behaviors [1].

AIM: To analyse prosodic impairments in children with high-functioning autism (HFA) compared to typically developing peers (TD), and to examine whether prosodic impairments are independent from other neuropsychological deficits (such as general language skills, vocabulary, nonverbal intelligence, attention, and executive function).

Method

Participants:

- 15 children (12 boys) with HFA (6 - 9 years; *M* = 7.40, *SD* = 1.12; IQ ≥ 70); they all met the DSM-5 criteria [1].
- TD group matched on age and gender (n = 15).

Materials:

- Prosodic Abilities: Profiling Elements of Prosody in Speech-Communication (PEPS-C) - European Portuguese Version [2] (see Fig. 1).
- Non-verbal Intelligence: Raven's Coloured Progressive Matrices.
- Language: Sub-scale Language - Griffiths Mental Development Scales.
- Vocabulary: Peabody Picture Vocabulary Test - 4.
- Pragmatics: Pragmatic Protocol.
- Attention: Children's Color Trails Test.
- Executive Functions: Behavior Rating Inventory of Executive Function, BRIEF-Parental Form.

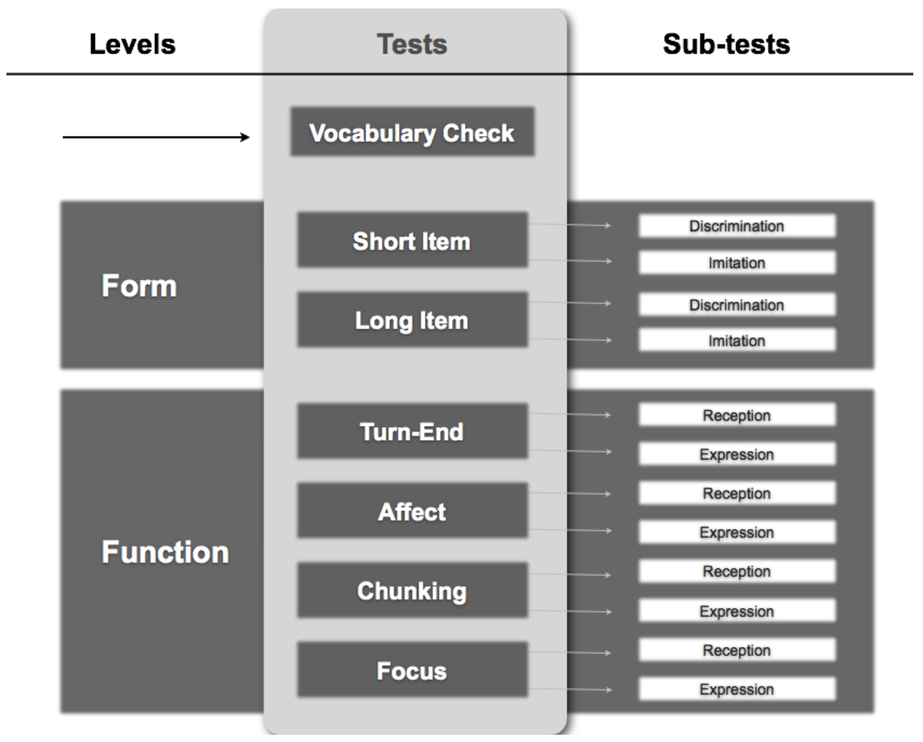

Figure 1. PEPS-C

Results

In general, children with HFA demonstrated lower performance on prosodic abilities (see Fig. 2). However, prosodic skills were strongly correlated with other neuropsychological abilities (see Fig. 3). Therefore, we controlled for the correlated variables and examined if the performance in the prosodic test was different between groups: When we controlled for nonverbal intelligence, results showed significant differences in two subtests of PEPS-C, namely Short-Item Discrimination and Turn-End Reception (F (1, 28) = 4.265, p = 0.049; η^2 = .136; F (1, 28) = 5.362, p < .028; η^2 = .166, respectively). Once we controlled for attention, the previous difference in the subtest Short-Item Discrimination disappeared. After language and vocabulary were included in the model, the difference between groups in the subtest Turn-End Reception disappeared.

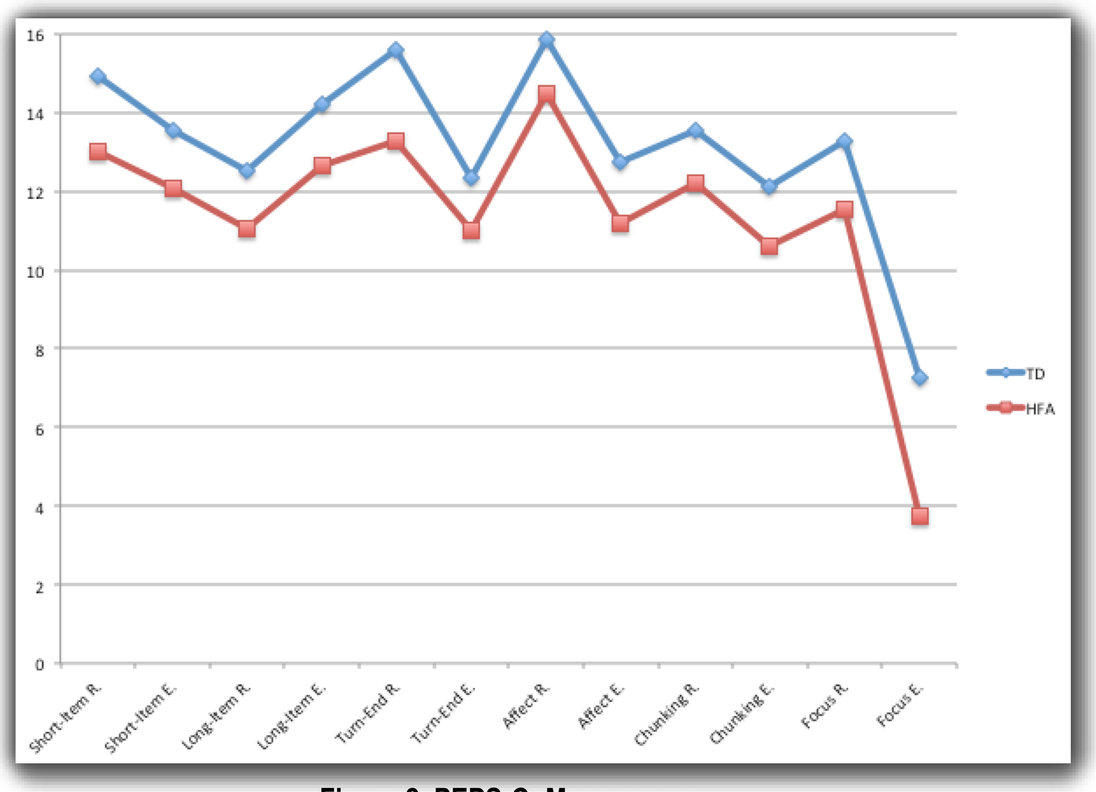

Figure 2. PEPS-C: Mean scores

	Prosody	Nonverbal Intelligence	Language	Vocabulary	Pragmatics	Attention
TD						
Nonverbal Intelligence	.65*					
Language	.24	.31				
Vocabulary	.21	.33	.67**			
Pragmatics	.58*	.56*	.09	-.03		
Attention	-.05	-.16	-.38	-.56*	.04	
Executive Function	.23	.092	.04	.09	.40	-.19
HFA						
Nonverbal Intelligence	.95**					
Language	.76*	.66**				
Vocabulary	.56*	.54*	.82**			
Pragmatics	.33	.45	.25	.18		
Attention	.52*	.56*	.45	.30	.19	
Executive Function	-.08	-.18	.06	-.03	-.56	-.27

Note. * p< .05. ** p≤ .0001.

Figure 3. Correlations

Conclusion

The present study addresses an important and understudied question: Whether prosody is independent from other neuropsychological impairments such as nonverbal intelligence, language, executive function, and attention. We found clear correlations between prosody and other abilities. More studies are needed to understand if disordered prosody is more likely to be due to other impairments, such as executive dysfunction, or a simple result of delayed language. The inconsistent picture of prosody in autism in previous research can be a result of methodological problems related with the assessment of prosody, poor diagnostic data, small samples sizes, and lack of appropriate comparison groups. Moreover, other deficits that are heterogeneous in this population might contribute for this variability.

References:

1] American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). Arlington, VA: American Psychiatric Publishing.

[2] Peppé, S., & McCann, J. (2003) Assessing intonation and prosody in children with atypical language development: the PEPS-C test and the revised version. Clinical Linguistics & Phonetics, 17(4/5), 345-354.

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