

Prosody in Children with Autism Spectrum Disorders

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Prosody

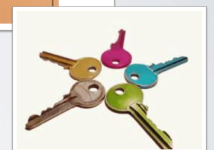
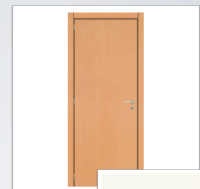
❖ Prosodic systems (e.g., prosodic structure, intonation, and rhythm) play a key role in spoken language. These systems mediate the phonetic substance of speech within a wide range of linguistic and communicative functions (Ladd, 2008; Peppé, 1998).

❖ The **way** a utterance is spoken can change the meaning...

Prosody



Retirado de Montreal Affective Voices http://ml.psygla.ac.uk/resources_main.php





Aim

Atypical prosodic patterns act as serious barriers to communication and may affect the process of language acquisition.

It is essential to study prosodic impairments in clinical populations...

We intend to analyse prosodic impairments in Autism Spectrum Disorders

Autism

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that involves impairments in:

Verbal and Non Verbal Social Communication

Repetitive Interests and Mannerisms

It is a disorder that begins before the 36 months of age (APA, 2013) and social deficits are frequently seen as the primary factor:

Autism

A wide range of variability characterizes the autistic spectrum:

Low-Functioning **High-Functioning** **Asperger**

← →

Severely Affected Slightly Affected

Prosodic Impairments

Study 1: Asperger Syndrome

Study 2: High-Functioning Autism

Study I

Prosodic Impairments: Asperger Syndrome

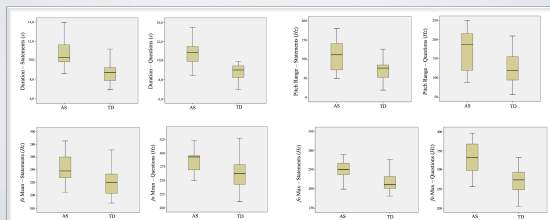
(Filipe, Frota, Castro, & Vicente, 2014; JADD)

- **Participants**
 - Clinical group: 12 (2 girls) aged between 8 to 9 years ($M = 8.58$, $SD = 0.51$); they all met the ICD-10 (World Health Organization, 1992) and DSM-IV-TR (American Psychiatric Association, 2000) criteria for AS.
 - TD group: 10 boys & 7 girls matched to the AS children on average age and non-verbal intellectual level assessed with the Raven's Coloured Progressive Matrices (Raven's CPM; Raven, 1995).
 - 35 Portuguese undergraduate students participated in the study.
- **Material & Procedure**
 - To capture the children's ability to distinguish statements from questions, we used the Turn-End subtest of the Profiling Elements of Prosody in Speech-Communication (PEPS-C; Peppé & McCann, 2003) adapted to European Portuguese. The children were assessed in a quiet room of their school in one individual session lasting for approximately 30 minutes
 - Atypicality judgments: All the 32 utterances from one child were sequentially arranged with a 4-second inter-stimulus interval; 29 tapes were produced, one per child. Adult participants used a 5-point scale from common to uncommon to rate how natural or odd the utterances sounded.

Study 1 Prosodic Impairments: Asperger Syndrome

(Filipe, Frota, Castro, & Vicente, 2014; JADD)

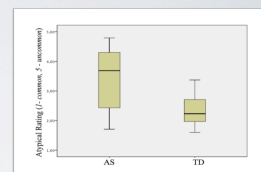
- Prosodic contours associated to statements and questions expressed by intonation in children with AS were categorically **accurate** for both receptive and expressive skills.
- However, acoustic measurements of AS children speech showed alterations in duration and pitch, and children with AS had greater variability in fundamental frequency contours compared to typically developing peers.



Study 1 Prosodic Impairments: Asperger Syndrome

(Filipe, Frota, Castro, & Vicente, 2014; JADD)

- Perceptual ratings of other people's perception of AS children speech revealed atypical expressive prosodic features when compared to TD children.
- Judges perceived AS children's productions as sounding significantly more atypical or uncommon ($F(1, 27) = 10.98; p = 0.003$).



These findings indicate that although the perception of statement and question intonation is not impaired in AS children, the acoustic form of the utterances they produced is.

Study 2 Prosodic Impairments: High-Functioning Autism (HFA)

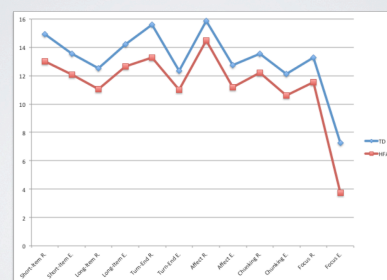
(Filipe, Frota, Villagomez, & Vicente, 2014; in revision)

- **Participants**
 - Clinical group: 15 (3 girls) aged between 6 to 9 years ($M = 7.40, SD = 1.12$); they all met the DSM-V (American Psychiatric Association, 2013) criteria for HFA.
 - TD group: 15 peers matched on age ($M = 7.53, SD = 0.99$) and gender.
- **Material**
 - Prosodic Abilities: PEPS-C - European Portuguese Version (Peppé & McCann, 2003)
 - Non-verbal Intelligence: Raven's Coloured Progressive Matrices (RCPM)
 - Language: Sub-scale Language - Griffiths Mental Development Scales
 - Vocabulary: Peabody Picture Vocabulary Test
 - Pragmatics: Pragmatic Protocol
 - Attention: Children's Color Trails Test (CCTT)
 - Executive Functions: Behavior Rating Inventory of Executive Function (BRIEF)
- **Procedure**
 - 3 to 5 sessions completed within a month and lasting approximately 45 minutes each.

Study 2 Prosodic Impairments: High-Functioning Autism (HFA)

(Filipe, Frota, Villagomez, & Vicente, 2014; in revision)

Prosody Results



Study 2 Prosodic Impairments: High-Functioning Autism (HFA)

(Filipe, Frota, Villagomez, & Vicente, 2014; in revision)

	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	.55**					
Language	.76*	.66**				
Vocabulary	.56*	.54*	.82**			
Pragmatics	.23	.45	.25	.18		
Attention	.52*	.56*	.45	.30	.19	
Executive Function	-.08	-.18	.06	-.03	-.56	-.27

Note. * $p < .05$, ** $p < .0001$.

The results showed significant correlations in the HFA for prosody, nonverbal intelligence, attention, language and vocabulary.

Study 2 Prosodic Impairments: High-Functioning Autism (HFA)

(Filipe, Frota, Villagomez, & Vicente, 2014; in revision)

We control the correlated variables and examined if the performance in a prosodic test was different between groups.

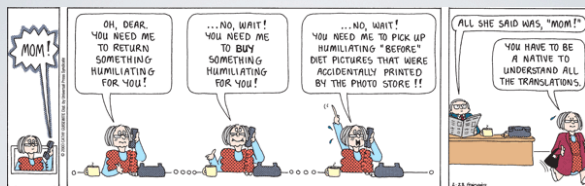
- When we control for nonverbal intelligence, results showed differences in the Short-Item Discrimination and Turn-end Reception ($F(1, 28) = 4.265, p = 0.049; \eta^2 = .136$; $F(1, 28) = 5.362, p < .028; \eta^2 = .166$, respectively).
- Once we control for attention, the differences in the Short-Item Discrimination disappear.
- After language and vocabulary were included in the model this difference disappear.

Conclusion

- The inconsistent picture of prosody in autism drawn by research can be a result of the methodological problems related with the assessment of prosody, poor diagnostic data, small sample sizes, and lack of appropriate comparison groups. However other basic deficits in prosodic impairments that are heterogeneous in this population might contribute to this variability.
- Prosody in autism should be explored in the context of linguistics, cognitive science, and neuropsychological perspectives.

References

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Thank You!