INTRODUCTION

Few studies explore the relation between prosodic development and executive functioning skills. Executive function (EF) is a neuropsychological construct corresponding to a complex set of processes that are responsible for goal-directed behavior, such as planning, cognitive flexibility, inhibition, organization, and working memory. Both prosody and EF begin to develop during the early years and some aspects continue to develop throughout the individual’s life. So far, little is known about the nature of the relationship between prosodic development and EF. In the present study we aim to understand how executive functions are related to different measures of prosody.

METHOD

Participants

109 European Portuguese native speakers

- 5/6 years (n = 14; M = 5.14; SD = 0.38)
- 7 years (n = 19; M = 7.54; SD = 0.28)
- 8 years (n = 18; M = 8.14; SD = 0.38)
- 9/10 years (n = 20; M = 9.40; SD = 0.50)
- 11/12 years (n = 12; 9.91; SD = 1.08)
- 15/16 years (n = 16; M = 16.25; SD = 1.29)

Material / Procedure

- Portuguese version of the Profiling Elements of Prosody in Speech-Communication (PEPS-C, see Fig. 1) [1]: assessing receptive and expressive prosodic skills in parallel. The tasks are at two levels: formal and functional. The formal level assesses auditory discrimination and voice skills required to perform the tasks, whereas the functional level evaluates receptive and expressive prosodic skills in four domains: (1) Affect – liking vs. disliking; (2) Turn-end – questions vs. statements; (3) Chunking – prosodic phrase boundaries; and (4) Focus – emphasis in a particular word.
- Behavior Rating Inventory of Executive Function - Short Parental Version (BRIEF, see Fig. 2) [2]: assessing EF behaviors in six clinical scales (Internal Emotion Regulation, External Emotion Regulation, Inhibition, Initiation/Flexibility, and Organization of Materials).

RESULTS

Table 1. Correlations between EF and prosodic abilities

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Our findings showed significant correlations between EF and prosodic abilities, more visible between 5 and 10 years, ranging from small (r = .42) to strong (r = .75) in different ages (see Table 1).

Specifically, correlations were observed between the affective-behavioral index (external/internal emotion regulation and inhibition control) and difficulties in affective or expressive prosodic difficulties. Also, correlations were observed between problems in the metacognitive index (planning/working memory, initiation/flexibility, and organization of materials) and some prosodic difficulties (both in receptive and expressive skills).

Metacognitive strategies increase individuals’ awareness of their thought processes and actions while completing tasks [3].

One possible explanation is that prosodic performance signals the abilities to use metacognitive strategies.

DISCUSSION

In sum, our findings suggest a possible correlation between prosody and some aspects of executive functioning. Therefore, the nature of this association should be considered in future research. These results may be of considerable interest for clinical practice, since executive function difficulties and prosodic deficits are characteristic of many neurodevelopmental disorders [4], such as autism.

ACKNOWLEDGMENTS: This work was funded by a grant from the Portuguese Foundation for Science (FCT).

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PHONETICS AND PHONOLOGY IN IBERIA (PaPi), LISBON, PORTUGAL, JUNE 24-25, 2013