



ORIGINAL ARTICLE

Executive functions and language in children with different subtypes of specific language impairment[☆]

V. Acosta Rodríguez^{*}, G.M. Ramírez Santana, S. Hernández Expósito

Facultad de Ciencias de la Salud, Universidad de La Laguna, Campus de Guajara, San Cristóbal de La Laguna, Santa Cruz de Tenerife, Spain

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KEYWORDS

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Abstract

Introduction: The marked heterogeneity among children diagnosed with specific language impairment (SLI) highlights the importance of studying and describing cases based on the distinction between the expressive and receptive-expressive SLI subtypes. The main objective of this study was to examine neuropsychological, linguistic, and narrative behaviours in children with different SLI subtypes.

Method: A comprehensive battery of language and neuropsychological tests was administered to a total of 58 children (29 with SLI and 29 normal controls) between 5.60 and 11.20 years old.

Results: Both SLI subtypes performed more poorly than the control group in language skills, narrative, and executive function. Furthermore, the expressive SLI group demonstrated substantial ungrammaticality, as well as problems with verbal fluency and both verbal and spatial working memory, while the receptive-expressive SLI subtype displayed poorer neuropsychological performance in general.

Conclusions: Our findings showed that children with either SLI subtype displayed executive dysfunctions that were not limited to verbal tasks but rather extended to nonverbal measures. This could reflect a global cognitive difficulty which, along with declining linguistic and narrative skills, illustrates the complex profile of this impairment.

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^{*} Corresponding author.

E-mail address: vacosta@ull.edu.es (V. Acosta Rodríguez).

PALABRAS CLAVE

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Funciones ejecutivas y lenguaje en subtipos de niños con trastorno específico del lenguaje**Resumen**

Introducción: La heterogeneidad existente entre los niños diagnosticados con trastorno específico del lenguaje (TEL) enfatiza la necesidad de su estudio y caracterización a partir de la distinción entre los subtipos TEL-expresivo y TEL-expresivo-receptivo. El principal objetivo de esta investigación ha sido estudiar el rendimiento neuropsicológico, lingüístico y narrativo en distintos subtipos de niños con TEL.

Método: Un protocolo de evaluación exhaustiva tanto de funciones lingüísticas como neuropsicológicas se administró a un total de 58 niños (29 TEL y 29 con desarrollo típico) entre los 5,60 y los 11,20 años de edad.

Resultados: Ambos subtipos de TEL obtuvieron peores resultados que el grupo control en las habilidades de lenguaje, en narración y en funcionamiento ejecutivo. Además, el subtipo TEL-expresivo evidenció una elevada presencia de agramaticalidad así como de problemas en la fluidez verbal y en memoria de trabajo verbal y espacial, mientras que el subtipo TEL-expresivo-receptivo obtuvo, en general, un peor rendimiento neuropsicológico.

Conclusiones: Nuestros hallazgos muestran como los niños de ambos subtipos de TEL tienen disfunciones ejecutivas que no se reducen a las tareas verbales sino que se extienden a las medidas no verbales. Todo ello podría reflejar una dificultad cognitiva general que, junto con un deterioro lingüístico y narrativo, confiere un perfil complejo a este trastorno.

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Introduction

Specific language impairment (SLI) is defined as a significant alteration in the acquisition and execution of language, in the context of appropriate sensory and brain development with no deficits in either intellectual ability or linguistic stimulation. However, mounting empirical evidence shows that symptoms in this patient population are highly heterogeneous. Therefore, a better methodological approach for characterising SLI might consist of analysing it by subtype. This methodology is supported by both psycholinguistics and neuropsychology, and it would probably reveal diverse anatomopathological substrates for each of the different subtypes.

Executive functions (EF) are defined as a group of mechanisms related to the optimisation of the cognitive processes aimed at resolving complex or new situations. They involve such functions as volition, working memory, planning, purposive action, and effective performance. Carrying out EF depends on the anatomo-functional integrity of the frontal cortex and its connections. Although the literature suggests that children with SLI may experience difficulties in several components of executive performance,¹¹ results are not consistent between studies; most depict SLI as a simple entity, without considering its heterogeneity. Therefore, the related studies of SLI subgroups and how they are linked to neuropsychological performance of executive functions will probably provide more in-depth knowledge of the pathophysiology of this disorder.

Children with SLI typically manifest deficits in narrative abilities. In this context, one proposed explanation of the underlying aetiology is cognitive changes, referring more

specifically to the executive function disorders identified in this population.² Some studies have shown that working memory is an essential mechanism that keeps relevant aspects of narratives active and available in the mind³; others point to the main role of attention, cognitive flexibility, inhibitory control, and planning skills in lending coherence and cohesion to stories.⁴

The profile of SLI underlines the need for early identification of children with the disorder, and for interventions directed at the cognitive domains with deficits. These actions would place us at a vantage point for preventing future alterations in the acquisition of basic instrumental skills, such as reading, and therefore prove beneficial for the self-esteem of these children. A recent groundbreaking study in this area has used questionnaires to assess self-perception in children with SLI, as well as how their parents perceive them.⁵ Using the Paediatric Quality of Life Inventory (PedsQL), the authors concluded that children with SLI perceive themselves as having altered physical and social functioning, whereas parents describe them as having social difficulties but no physical problems. This article produces scientific evidence of the need to mitigate other disturbances that may affect the population with SLI concomitantly if they are not treated in time.

In light of the above, we designed our study to analyse the differences between 2 SLI subtypes and how they may affect narrative tasks and executive functions in patients. We proposed the following objectives: first, we aimed to analyse links between each group (receptive/expressive developmental language disorder [RE-SLI], expressive language disorder [E-SLI], and control) and the diverse linguistic tests that help us identify SLI. These tests examine

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