

# Linguistic features in children born very preterm at preschool age

ANNALISA GUARINI<sup>1</sup> | ANDREA MARINI<sup>2</sup> | SILVIA SAVINI<sup>1</sup> | ROSINA ALESSANDRONI<sup>3</sup> | GIACOMO FALDELLA<sup>3</sup> | ALESSANDRA SANSAVINI<sup>1</sup>

**1** Department of Psychology, University of Bologna, Bologna; **2** Department of Human Sciences, University of Udine & Scientific Institute, IRCCS Eugenio Medea, San Vito al Tagliamento, Pordenone; **3** Neonatology and Neonatal Intensive Care Unit, S.Orsola-Malpighi Hospital, Department of Medical and Surgical Sciences, University of Bologna, Bologna, Italy.

Correspondence to Annalisa Guarini at Department of Psychology, University of Bologna, Viale Berti Pichat 5, 40127 Bologna, Italy. E-mail: annalisa.guarini@unibo.it

This article is commented on by Luinge on pages 895–896 of this issue.

## PUBLICATION DATA

Accepted for publication 10th February 2016.

Published online 7th April 2016.

## ABBREVIATIONS

VPT Very preterm

**AIM** This cross-sectional study focused on the effect of very preterm (VPT) birth on language development by analysing phonological, lexical, grammatical, and pragmatic skills and assessing the role of cognitive and memory skills.

**METHOD** Sixty children (29 males, 31 females) born VPT (<32wks) aged 5 years were compared with 60 children with typical development. The linguistic assessment was performed by administering a battery of Italian tests for the evaluation of language; cognitive and memory skills were assessed by Raven's coloured progressive matrices and digit span subtest (Wechsler Intelligence Scale for Children [WISC-III]).

**RESULTS** Children born VPT showed delays in lexical (comprehension: z-score difference  $-1.18$ ; 95% confidence interval [CI]  $-1.60$  to  $-0.77$ ; naming:  $-0.88$ ; 95% CI  $-1.19$  to  $-0.58$ ) and pragmatic skills (comprehension:  $-0.76$ ; 95% CI  $-1.02$  to  $-0.49$ ; narrative production:  $-0.47$ ; 95% CI  $-0.72$  to  $-0.23$ ). Delays in phonology and grammar were less diffuse, involving productive skills ( $-1.09$ ; 95% CI  $-1.64$  to  $-0.54$ ;  $-0.48$ ; 95% CI  $-0.85$  to  $-0.12$ , respectively), and were dependent by cognitive and memory skills. Lexical delays were more specific.

**INTERPRETATION** The linguistic profile of children born preterm is characterized by some abilities more impaired than others. This highlights the need of a linguistic assessment at the end of preschool age in order to plan a focused intervention aimed at improving lexical and pragmatic skills.

Recent reviews and meta-analyses suggest that very preterm birth (VPT, gestational age <32wks) might affect language development from the first years of life up to adolescence.<sup>1–3</sup> It has been argued that the developmental pathway of children born preterm is atypical and not merely delayed. Indeed, it is characterized by peculiar developmental patterns and relationships among competences consequent to the complex interaction between biological and environmental constraints linked to the premature interruption of pregnancy.<sup>2</sup> However, to the best of our knowledge, the hypothesis of an atypical pathway in language development among preterm children has not been verified, and several questions still need answers. Is language development delayed or are some specific linguistic abilities impaired in preterm children? What are the roles of cognitive and memory abilities?

Previous studies have usually adopted global linguistic indexes,<sup>3</sup> and have provided heterogeneous findings.<sup>1</sup> The few studies that have investigated specific linguistic abilities in children born VPT have usually focused on a restricted set of abilities. As a consequence, some linguistic skills,

such as lexical processing,<sup>3</sup> have been investigated far more than others, such as phonological and pragmatic skills.<sup>1,2</sup> The effects of preterm birth can also vary according to the child's developmental age.<sup>3</sup> VPT infants have difficulties in a wide range of linguistic skills in the first years of life, with a higher incidence of language delay than in full-term peers: 34% at 3 years 6 months<sup>4</sup> and 29% at 4 years of age.<sup>5</sup> The few studies that have analyzed linguistic processing in 4- to 6-year-old children born VPT suggest that, by preschool age, difficulties become less diffuse and with contrasting results, which suggests that some linguistic abilities are more affected than others (Table SI, online supporting information).<sup>6–10</sup> However, no study has provided a comprehensive analysis of the effects of preterm birth on all linguistic skills. This is particularly true for pragmatic and discourse abilities: these skills have not been investigated among children born VPT at preschool age, whereas some difficulties have been described at 7 years and 9 years of age.<sup>11,12</sup>

Another relatively unexplored issue relates to the role of cognitive and memory skills in language development. Stud-