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Language profiles in children with Down Syndrome and children with Language Impairment: Implications for early intervention

Kamila Polišenská [a,*], Svetlana Kapalková [b]

[a] The University of Manchester School of Psychological Sciences, Oxford Road, M13 9PL Manchester, United Kingdom
[b] Comenius University Institute of Psychology and Speech Therapy Studies, Faculty of Education, Račianska 59, 813 34 Bratislava, Slovakia

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ABSTRACT

This study investigated early language profiles in two groups of children with developmental disability: children with Down Syndrome (DS, $n = 13$) and children with Language Impairment (LI, $n = 16$). Vocabulary and grammatical skills in the two groups were assessed and compared to language skills of typically developing (TD) children matched on size of either their receptive or expressive vocabulary ($n = 58$). The study aimed to establish if language development in these groups is delayed or fundamentally different than the TD groups, and if the group with DS showed a similar language profile to the group with LI. There is a clinical motivation to identify possible key risk characteristics that may distinguish children who are likely to have LI from the variation observed in TD children.

Three clear findings emerged from the data. Firstly, both receptive and expressive vocabulary compositions did not significantly differ in the clinical groups (DS and LI) after being matched to the vocabulary size of TD children. This provides further support for the idea that word learning for the children in the clinical groups is delayed rather than deviant. Secondly, children with LI showed a significantly larger gap between expressive and receptive word knowledge, but children with DS showed a pattern comparable to TD children. Thirdly, children with LI who understood a similar number of words as the TD children still had significantly poorer grammatical skills, further underlining the dissociation between lexical and grammatical skills in children with LI. Grammatical skills of children with DS were commensurate with their lexical skills. The findings suggest that language intervention should be specifically tailored to etiology rather than focused on general communication strategies, particularly in children with LI.

1. Introduction

The present study examines the similarities and differences in the linguistic profiles of children with Down Syndrome (DS) and children with Language Impairment (LI).[1] It has two primary aims: (i) To examine the composition of receptive and expressive vocabulary in children with DS and children with LI. (ii) To examine ties between grammar/the lexicon and

* Corresponding author. Tel.: +44 0161 275 3369.
E-mail address: kamila.polisenska@manchester.ac.uk (K. Polišenská).

[1] Children with Language Impairment struggle to acquire language in the absence of neurological, sensory or cognitive deficit and there is a range of alternative terms for this condition (e.g. late talkers, early language delay, specific expressive language impairment, late language emergence, primary language impairment), for discussion see Cable and Domsch (2011). This study refers to this group as children with Language Impairment.

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compare these clinical groups to typically developing (TD) children with a vocabulary of a similar size. Research on the linguistic profiles of different clinical populations can contribute to our understanding of both the nature and variability within language development and reveal how developmental disorders affect language development. This study investigates if detailed language profiles are associated with a particular clinical condition and considers the implications for clinical practice. If children with different etiologies have different language profiles, this would call for specific intervention programs tailored according to the specific weaknesses of a particular clinical condition.

Previous research has often focused on the relation between language and cognition, but our cross-population study focuses on the composition of the lexicon and relationships between grammar and the lexicon. As a result, our study matched vocabulary skills rather than mental age. By matching vocabulary sizes, we were better able to address the question of delayed vs. deviant development and also consider the role a smaller vocabulary may play in the acquisition of grammatical skills. By addressing the similarity/difference between the clinical groups and TD groups, we intend to contribute to the debate on 'deviant' vs. 'delayed' language development in children with DS and children with LI (Laws & Bishop, 2003). The novelty of the present study lies in the matching and in providing two control groups for each clinical group: one control group with an equal receptive vocabulary size and one matched on expressive vocabulary size. Tracking receptive and expressive vocabulary separately might be particularly relevant in clinical populations when children may only understand and/or use a few words. As Cable and Domsch (2011) pointed out, study designs would benefit from measuring and reporting receptive vocabulary skills to provide a fuller picture of participants' skills.

There is ongoing debate in the child language literature on the dissociations between language components (see Marchman & Thal, 2005 for review). Are grammar and the lexicon really two distinct components (e.g. Ardila, 2012; Pinker & Ullman, 2002) or do they represent one interdependent language system (e.g. Bates & Goodman, 1997)? Different components can also develop at different rates, e.g. comprehension often precedes production and lexical skills precede grammatical skills (Bates, Dale, & Thal, 1995). Marchman and Bates (1994) proposed that a critical mass of lexical items need to be acquired in order for grammatical skills to emerge, and a large study by Bates, Bretherton, and Snyder (1988) suggested that 50–100 words provides a benchmark for TD English-speaking children to progress in word combinations. A more recent study by McGregor, Sheng, and Smith (2005) on TD English-speaking 2-year-old children found that vocabulary size was significantly related to grammatical skills and vocabulary size was a better predictor of grammatical skills than chronological age. However, data from clinical populations have been used to support the view that lexical and grammatical components are distinct (e.g. Bates et al., 1995; Ring & Clahsen, 2005).

1.1. Vocabulary and grammar development in children with Down Syndrome

Many studies have suggested that the language abilities of children with DS are less developed than would be expected from their intellectual ability. Miller (1999), and more recently Ypsilanti, Grouios, Alevriadou, and Tsapkini (2005), reported that children with DS have weak expressive language, but receptive language appears to be less impaired. Another discrepancy has been reported between grammar (a particular weakness in DS populations) in relation to relative strength in vocabulary (e.g. Fowler, 1990; Laws & Bishop, 2003). It has also been shown that the transition from the one-word to two-word stage is delayed (Iverson, Longobardi, & Caselli, 2003).

The critical mass hypothesis predicts that if children have the necessary number of lexical items in their expressive vocabulary, then grammatical skills will emerge because grammar and the lexicon are interdependent. However, Bates et al. (1995) found a significant dissociation between grammar and the lexicon in DS children. A sufficient number of lexical items without the expected grammatical attainment was explained as 'a necessary but not sufficient condition for the acquisition of grammatical function words, the onset of word combinations, and growth in sentence complexity' (p. 147). Findings from Italian (Caselli, Monaco, Trasciani, & Vicari, 2008; Vicari, Caselli, & Tonucci, 2000; Zampini & D'Odorico, 2011), Spanish (Galeote, Soto, Sebastián, Checa, & Sánchez-Palacios, 2013) and Swedish (Berglund, Eriksson, & Johansson, 2001) support the Bates and Goodman (1999) hypothesis of a close relationship between vocabulary size and the emergence of grammar in all children, including those with DS. They also suggest that the language development of children with DS is delayed rather than qualitatively different. Although no obvious dissociation between lexical and grammatical development abilities in Italian-speaking children with DS was reported, Zampini and D'Odorico (2011) suggested that the vocabulary composition in children with DS in their study appeared to be less complex. The present study will add to the cross-linguistic research on the relation between the lexicon and grammar and include a detailed analysis of the composition of vocabulary in children with DS.

1.2. Vocabulary and grammar development in children with Language Impairment

Studying early vocabulary and emerging grammatical skills in children with primary language impairment presents numerous challenges. Diagnosis of primary/specific language impairment (SLI) is usually not established before 3 years of age (Rossetti, 2001), unlike DS where the condition is often known about before birth. There is a great deal of research on lexical and grammatical skills in children with delayed language, but only some of these children will continue to show the delayed language skills in later age. In other words, some late talkers will catch up with their peers while others will show signs of Language Impairment. The children who are diagnosed with LI are the focus of our study. Hick, Joseph, Conti-Ramsden, Serratrice and Faragher (2002) explored vocabulary profiles of children with SLI. They concluded that children