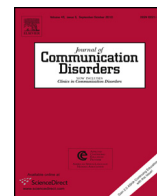




ELSEVIER

Contents lists available at ScienceDirect

Journal of Communication Disorders



Novel word learning: An eye-tracking study. Are 18-month-old late talkers really different from their typical peers?

Erica M. Ellis^{a,c,*}, Arielle Borovsky^b, Jeffrey L. Elman^c, Julia L. Evans^{c,d}

^a School of Speech Language & Hearing Sciences, San Diego State University, San Diego, CA, United States

^b Department of Psychology, Florida State University, Tallahassee, FL, United States

^c Center for Research in Language, University of California, San Diego, La Jolla, CA, United States

^d School of Behavioral & Brain Sciences, University of Texas at Dallas, Richardson, TX, United States

ARTICLE INFO

Article history:

Received 25 August 2014

Received in revised form 7 June 2015

Accepted 16 June 2015

Available online 9 July 2015

Keywords:

Infants

Toddlers

Late talkers

Word learning

Fast mapping

Eye tracking

ABSTRACT

Infants, 18–24 months old who have difficulty learning words compared to their peers are often referred to as “late talkers” (LTs). These children are at risk for continued language delays as they grow older. One critical question is how to best identify which LTs will have language disorders, such as Specific Language Impairment (SLI) at school age, in order to maximize the opportunity for early and appropriate intervention and support. Recent research suggests that LTs are not only slower to learn and speak words than their peers, but are also slower to recognize and interpret known words in real time.

This investigation examined online moment-by-moment processing of novel word learning in 18-month-olds. A low vocabulary, late talking group (LT, $N = 14$) and an age and cognitive-level matched typical group (TYP, $N = 14$) of infants participated in an eye-tracked novel word learning task and completed standardized testing of vocabulary and cognitive ability. Infants were trained on two novel word-picture pairs and then were tested using an adaptation of the looking while listening paradigm. Results suggest that there are differences between groups in the time-course of looking to the novel target picture during testing. These findings suggest that LTs and typical infants developed strong enough representations to recognize novel words using traditional measures of accuracy and reaction time, however interesting group differences emerge when using additional fine-grained processing measures. Implications for differences in emerging knowledge and learning patterns are discussed.

Learning outcomes: The reader will be able to understand many benefits of using eye-tracking methods to study young infant and toddler populations with and without language disorders. Readers will learn that examining moment-by-moment time course of novel word learning allows additional insight into different learning patterns. Finally, readers should understand the data from this article suggest late talkers may have different emerging representations of novel words than their typical peers, which may contribute to their difficulty learning new words.

© 2015 Elsevier Inc. All rights reserved.

* Corresponding author at: Center for Research in Language, University of California, San Diego, 9500 Gilman Dr., La Jolla, CA 92093-0526, United States.

1. Introduction

Most children begin saying their first words around 12 months, although there is considerable variance in both comprehension and production at this age. At 18–24 months, infants have approximately 50 words in their productive vocabulary and are beginning to produce two words together. Though this ability to understand and say new words can appear simple, it is a complex process that involves the coordination of many skills that rely on visual and auditory processing. Infants and toddlers learn to link a set of sound sequences to the appropriate referent, often without explicit feedback. By the time most toddlers have reached their second birthday, they are able learn words quickly and seem to increase the number of words in their vocabulary on a daily basis. There are significant individual differences in vocabulary infants' abilities at 18–24 months, with some infants and toddlers displaying very low levels of vocabulary comprehension and production. These infants are often referred to as late talkers (LT).

Late talkers are healthy full-term toddlers, typically 18–24 months old, with normal cognitive development, normal hearing and no significant birth history; however, they have delays in the onset of producing their first words (Ellis & Thal, 2008; Ellis Weismer, & Evans, 2002; Thal, 2000). Most often, late talkers are defined by having fewer than 50 words in their productive vocabulary at the age of 24 months, with no two-word combinations and importantly these LTs are at risk for continued language delay (Ellis & Thal, 2008; Rescorla & Dale, 2013; Thal, Marchman, & Tomblin, 2013). Persistent language delay in young children can result in Specific Language Impairment (SLI). Children with SLI have consistent difficulty acquiring and using language despite the absence of hearing, intellectual, emotional, or frank neurological impairments (cf. Bishop, 1997; Leonard, 1998). They often continue to have clinically significant language problems throughout adolescence and adulthood (e.g., Bishop & Edmundson, 1987; Tomblin, Zhang, Buckwalter, & O'Brien, 2003), placing them at risk for continued social, academic, and employment failure.

Of the infants classified as LTs at 18–24 months of age, a subset (approximately 17–26%) will continue to have language impairment by age six (Paul, 1996; Rescorla, 2002). A key question for Speech-Language Pathologists, researchers and most importantly, parents, is: How do we determine which late talking infants will have SLI versus those who will be typical by school age? Infant vocabulary levels combined with factors such as socioeconomic status (SES) and family history of impairment have low sensitivity and specificity in correctly classifying children as having SLI at age five (Dale, Price, Bishop, & Plomin, 2003), and correctly identify less than 30% of LTs who will have SLI (Ellis & Thal, 2008; Thal et al., 2013; Zubrick, Taylor, Rice, & Slegers, 2007). The large degree of variability in the rates of word learning may contribute to the difficulty differentiating LTs at risk for SLI from LTs who will go on to develop typically. Further, as Ellis Weismer, Venker, Evans, and Moyle (2012) point out, an additional problem in the early identification of children with SLI is that late talking does not denote a clinical diagnosis. It merely means only that a toddler's expressive and/or receptive vocabulary is at the low end of the normal distribution for toddlers that age. To begin addressing the difficulty in correctly identifying and predicting which LTs will continue to have language learning problems, one approach is to examine other factors that might prove to be better "early indicators" of SLI other than low vocabulary skills. Specifically, that is to examine lexical processing abilities in LT infants and toddlers as they learn new words.

1.1. Lexical processing deficits in SLI

Children with SLI have significant difficulties with the lexical-phonological aspects of word learning and word processing. Lexical-phonological deficits are often defined as difficulty with processing and representation of the word form (Mainela-Arnold, Evans, & Coady, 2008; Mainela-Arnold, Evans, & Coady, 2010a; Mainela-Arnold, Evans, & Coady, 2010b). Thus, words in the lexicons of children with SLI are less well specified as compared to their peers, making their lexical access vulnerable to interference from other words and requiring more of the speech signal for them to recognize words during spoken language processing as compared to typical children (Mainela-Arnold et al., 2008). Children with SLI are significantly slower and less accurate in accessing and producing words in their lexicon and significantly slower and less accurate in differentiating words from non-words (Katz, Curtiss, & Tallal, 1992; Lahey & Edwards, 1996; Lahey & Edwards, 1999; Leonard, 1998; Leonard, Nippold, Kail, & Hale, 1983; Leonard et al., 2007).

Children with SLI also have significant deficits in phonological working memory, which is a foundational skill necessary for word learning (Alt & Plante, 2006). They have significant difficulty holding nonwords in memory long enough to repeat those nonwords during repetition tasks (e.g., Coady & Evans, 2008), and unlike normal language controls, are unable to use lexical and sub-lexical information from words stored in their lexicon to facilitate repetition of nonwords that are structurally similar to words they already know (Coady, Evans, & Kluender, 2010). The impact of phonological working memory deficits in SLI can be in their poor performance on novel word learning tasks, and children with SLI have significant difficulty learning new words and linking these newly learned words to their referents (Dollaghan, 1987; Ellis Weismer & Hesketh, 1996; Gray, 2003; Rice, Buhr, & Oetting, 1992). They can require more than twice the number of training trials before they are able to show the same level of performance as typical controls (Ellis Weismer & Hesketh, 1996, 1998) and even after increased exposure to the novel word form, children with SLI are slower and less accurate at linking novel labels to novel objects (Alt & Plante, 2006; Dollaghan, 1987; Ellis Weismer & Evans, 2002; Gray, 2004, 2005, 2006; Oetting, Rice, & Swank, 1995).

Download English Version:

<https://daneshyari.com/en/article/910762>

Download Persian Version:

<https://daneshyari.com/article/910762>

[Daneshyari.com](https://daneshyari.com)